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Anemia in Dogs

What does it mean to be \"anemic\"?

Anemia is a medical term referring to a reduced number of circulating red blood cells (RBC's), hemoglobin (Hb), or both. It is not a specific disease but rather is the result of some other disease process or condition. Hemoglobin delivers oxygen to the cells and tissues of the body, and a patient who is anemic will suffer from symptoms related to a lack of oxygen.

Red blood cells are produced in the bone marrow and are released into the blood where they circulate for approximately two months. As they age or become damaged, they are removed from the bloodstream, and their components are recycled to form new red blood cells. The number of red blood cells may become reduced because of decreased production or increased loss of red blood cells.

What are the symptoms of anemia?

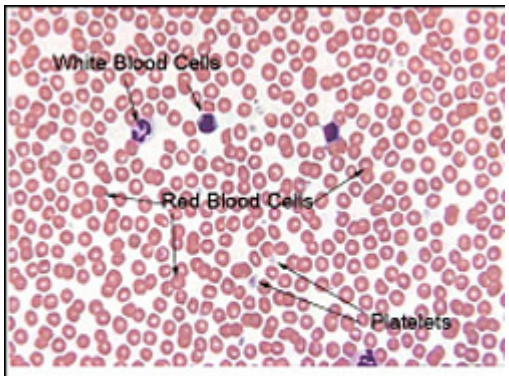
The most easily observed and common clinical sign of anemia is a loss of the normal pink color of the gums; they may appear pale pink to white when examined.

"Pale gums and lethargy indicate the need to perform blood tests."

Anemic dogs also have little stamina or energy so they seem listless or tire more easily. Pale gums and lethargy indicate the need for a check up and performance of blood tests.

How is anemia diagnosed?

Several tests are performed on the blood sample to diagnose anemia. The most common test is the **packed cell volume (PCV)** or **hematocrit (HCT)**. These tests are often performed as part of a complete blood cell count (CBC). A blood sample is processed in a centrifuge to separate the red blood cells from the plasma (the liquid part of the blood). Once separated, the sample is measured to determine what percentage of the sample is made up of red blood cells. Thirty-five to fifty-five percent of a normal dog's blood will be red blood cells. If the PCV is below 35%, the dog is anemic. Others tests to determine anemia include the **red blood cell count** and the **hemoglobin count**.



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What other tests are important when a dog is anemic?

When there is evidence of a low red blood cell count, it is important to know if the bone marrow is producing an increased number of new red blood cells in response to the lost red blood cells. Some new red blood cells will be released from the bone marrow prematurely, and these immature red blood cells, called *reticulocytes,* can be stained for easier identification on the **blood smear**. The presence of increased numbers of reticulocytes indicates that the anemia is "responsive". Most automated blood analyzers will detect the presence of reticulocytes to help your veterinarian quickly determine the body's response to anemia.

A careful study of the blood smear is also important to look for parasites that might be causing red blood cell destruction and abnormal cells that could indicate leukemia (high white blood cell count).

A **bone marrow biopsy or aspirate** is obtained if there is concern that the bone marrow is not responding appropriately to the anemic state. A sample of bone marrow is withdrawn and analyzed, providing valuable information about its condition, and occasionally revealing the cause of the anemia.

"...providing important information about the overall health of the dog."

A **biochemical profile** and **urinalysis** are other important tests for anemic dogs. These tests evaluate organ function and electrolyte levels, providing important information about the overall health of the dog.

A **fecal parasite exam** is important to identify the presence of parasites in the intestinal tract that might be causing blood loss.

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What causes anemia?

There are many diseases that can cause anemia. These are grouped into 1) diseases that cause blood loss, 2) diseases that cause hemolysis (red blood cell breakdown or destruction), and 3) diseases that decrease the production of red blood cells through bone marrow suppression.

What diseases of dogs cause blood loss?

The main causes of blood loss in dogs include:

- Trauma or injury to blood vessels or damage internal organs, causing persistent bleeding.
- Heavy infestations of parasites such as fleas, ticks, and hookworms.
- Tumors of the intestinal tract, kidneys, urinary bladder and spleen.
- Diseases that prevent proper blood clotting.

What diseases of dogs cause hemolysis?

The main causes of hemolysis or the destruction of red blood cells within the body in dogs include:

- Autoimmune disease, especially immune-mediated hemolytic anemia
- Blood parasites

- Chemicals or toxins
- Neoplasia (cancer)

What diseases of dogs prevent red blood cell production through bone marrow suppression?

The main causes of bone marrow suppression that result in decreased red blood cell production include:

- Any severe, chronic (long-lasting) disease (such as chronic kidney or liver disease)
- Very poor nutrition or nutritional imbalances
- Autoimmune disease
- Hypothyroidism
- Chemicals or toxins
- Neoplasia (cancer)

Do dogs get iron deficiency anemia?

Iron deficiency anemia is a somewhat common disease in people, especially women.

"Iron deficiency is uncommon in dogs..."

However, iron deficiency is uncommon in dogs and is usually secondary to some form of chronic blood loss. It is occasionally seen in puppies with severe hookworm infections or that are being fed very poor diets.

How is anemia treated?

If your dog's anemia is so severe that it is life threatening, a blood transfusion will be needed. Before giving a transfusion, blood samples will be taken for diagnostic testing. The main purpose of a blood transfusion is to stabilize the dog while the underlying cause of the anemia is determined and other treatments can begin to take effect.

Further, more specific treatment will be determined once the underlying disease causing the anemia has been diagnosed. Treatments may include corticosteroids, anthelmintics (de-worming medications), other medications, or surgery. Your veterinarian will outline a treatment plan specific for your dog's needs, based on diagnostic test results.

What is the prognosis for anemia?

The prognosis for dogs with anemia is based on the specific diagnosis, as well as the patient's general condition at the time of diagnosis.

If the anemia is diagnosed early and the cause is reversable, the prognosis is good. Dogs that have severe anemia caused by toxins, cancer or autoimmune diseases, or have suffered severe trauma have a less favorable prognosis.

Reviewed and edited by Dr. Vlad Stojanovic DVM, DACVIM

This client information sheet is based on material written by: Ernest Ward, DVM

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