

Immune-Mediated Hemolytic Anemia in Dogs and Cats

Immune-mediated hemolytic anemia (IMHA) is the term used to describe the destruction of red blood cells by the body's immune system. Sometimes this disease is called autoimmune hemolytic anemia and AIHA.

Causes of immune-mediated hemolytic anemia...

Certain infections, vaccinations, medications and/or cancers may trigger this disease, including:

- Bacterial infections - *Mycoplasma* spp., *leptospirosis*, *pyometra* (uterine infection), *discospondylitis* (vertebral/backbone infection), *endocarditis* (heart muscle infection), *urinary tract infections*
- Parasitic infections - *Babesia* spp., *Ehrlichia* spp., *Dirofilaria immitis* (heartworm infection), *Leishmania* spp., *Cytauxzoon felis*, *Anaplasma phagocytophilum*
- Viral infections - *feline leukemia virus (FeLV)*
- Systemic lupus erythematosus (SLE)
- Reactions to certain drugs - *penicillins*, *cephalosporins*, *sulfa drugs*, *amiodarone*, *methimazole*, *propylthiouracil*
- Cancers - *lymphoma*, *hemangiosarcoma*, *multiple myeloma*, *leukemia*
- Toxins - *bee sting envenomation*

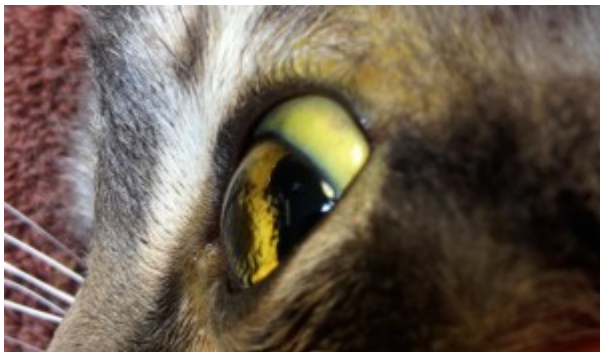
When an underlying cause can be identified, the disease is called secondary IMHA. Unfortunately an underlying cause is frequently *never* identified in the majority of dogs and cats - this is called *primary* or *idiopathic* IMHA. Certain dog breeds are predisposed to developing primary IMHA, including American cocker spaniels, Old English sheepdogs, Irish setters, poodles and dachshunds. To date, there is no breed predisposition documented in cats.



Clinical signs of immune-mediated hemolytic anemia...

Red blood cells transport oxygen to all tissues in the body. When their numbers are decreased, less oxygen is available to help fuel the body's important metabolic functions. Common clinical signs of IMHA in dogs and cats include:

- Pale gums
- Acting tired, weakness or collapse
- Shallow, rapid and/or labored breathing
- Icterus/jaundice (yellow discoloration of the eyes and skin)



- Darkened (orange or port wine color) urine
- Reduced or loss of appetite

Diagnostic tests for immune-mediated hemolytic anemia...

Several non-invasive tests are essential to accurately diagnose patients with IMHA, including those that:

- Measure red blood cells, white blood cells and platelets (cells that help

with blood clotting) - *complete blood count, peripheral blood film evaluation*

- Evaluate major organ function, like the liver and kidneys - *biochemical profile & urinalysis*
- Assess the immune system - *peripheral blood film evaluation, saline slide agglutination test, Direct Coomb's test or direct antibody test, antinuclear antibody test (ANA)*
- Look for certain infectious diseases, such as those transmitted by ticks - *polymerase chain reaction (PCR) or antibody/serology tests*
- Determine if the bone marrow is functioning properly - *bone marrow cytology & biopsy*
- Screen for cancer - *chest radiographs (x-rays), abdominal radiographs, abdominal ultrasound, bone marrow cytology & biopsy*

Suppressing the immune system to treat immune-mediated hemolytic anemia...

Modulating the immune system is essential to effectively beating this disease. The initial treatment most commonly used to modulate the immune system is a steroid called prednisone; side effects are common but *temporary*, and may include:

- Increased thirst
- Increased appetite
- Increased frequency of urination
- Panting
- Muscle weakness
- Weight gain

Some patients with IMHA can be successfully managed with prednisone alone. However in my experience, most benefit from the use of more than one immunosuppressive drug. Let's think about hammering in a railroad spike.



The railroad spike represents the immune system, and the individual hammering in the spike represents an individual immunosuppressive drug. With only 1 person (1 drug), more effort (high drug dosage) will be required to hammer in the spike (suppress the immune system). If multiple people (more than 1 drug) are used to hammer in the spike, each person doesn't have to work as hard (one can use lower drug dosages) and the job (suppression of the immune system) is accomplished more rapidly.

No study has yet identified the perfect immunosuppressive protocol, one that works for every patient. To help develop the best possible treatment plan for your pet, consulting with a board-certified internal medicine or critical care specialist can be invaluable. Some drugs that may be recommended (or at least discussed) include:

- Cyclosporine
- Azathioprine
- Mycophenolate mofetil
- Leflunomide
- Intravenous immunoglobulin G (IVIg)
- Liposomal-encapsulated clodronate

If a pet has an infection, it must be appropriately treated because inhibiting the immune system's ability to fight such an infection could allow the infection to (rapidly) spread. Patients who fail to respond to traditional immunosuppressive therapy may benefit from surgical removal of the spleen or a specialized blood-cleansing procedure called plasmapheresis that can be performed at certain

specialty hospitals.

Ensuring tissues get enough oxygen...

Remember that red blood cells carry oxygen to all tissues of the body. When they are destroyed by the immune system, vital organs are subsequently deprived of oxygen. Thankfully patients can be given red blood cell transfusions to help improve the oxygen-carrying capacity of the blood.



Dogs and cats, like humans, have their own specific blood types, and patients who receive a transfusion should be monitored very closely by a medical team that has extensive experience caring for transfusion patients.

Preventing blood clot formation in immune-mediated hemolytic anemia...

The number one cause of complications and death from IMHA is the development of abnormal blood clots (aka: thromboemboli). As part of this disease, red blood cells become “sticky” and clump together. These clumps can subsequently lodge in vital organs to potentially cause labored breathing, abnormal heart rhythms, strokes, and even sudden death. The best anti-clot protocol has not yet been identified, and a specialist may recommend the use of anti-platelet aggregation (i.e.: *ultra low-dose aspirin, clopidogrel/Plavix*) and/or anticoagulant (*unfractionated heparin or low-molecular-weight heparin/Lovenox*) drugs.

What's the long-term outcome for immune-mediated hemolytic anemia...

Patients with IMHA require long-term and often lifelong treatment. In general you should expect to treat your pet with immunosuppressive medication(s) for a minimum of 3-7 months, and drug dosages generally should not be tapered by more than 25% each month; furthermore whenever possible, only one drug dose should be adjusted at a time. Documented mortality rates for IMHA are relatively high (29-70%), and disease relapse is common (12-24%). The largest percentage of deaths occur within the first two weeks of diagnosis, and dogs who survive this time period have a reported six-month survival time of 92.5%.

The take-away message for immune-mediated hemolytic anemia...

Immune-mediated hemolytic anemia can be a life-threatening disease, but with aggressive medical management patients can respond to prescribed therapies and ultimately lead happy, healthy lives. Board-certified internal medicine and critical care specialists have extensive experience diagnosing and managing patients with IMHA, and their involvement as a member of your pet's healthcare team can be invaluable.

To find a board-certified veterinary internal medicine specialist, please visit the [American College of Veterinary Internal Medicine](#).

To find a board-certified veterinary emergency and critical care specialist, please visit the [American College of Veterinary Emergency and Critical Care](#).

To find a board-certified veterinary surgeon, please visit the [American College of Veterinary Surgeons](#).

Wishing you wet nosed kisses,

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For more information...

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