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### Immune-mediated diseases in Dogs and Cats

Dogs and cats develop autoimmune diseases similarly to people. These diseases occur when the patient's own immune system attacks its own cells or tissues due to a loss of tolerance for self. The majority of these cases are idiopathic (no known etiology can be found), although ruling out underlying disease processes is warranted to optimize therapy for each patient. Underlying diseases associated with immune disease in dogs and cats include cancer, systemic lupus erythematosus (SLE, Lupus), infectious diseases including tick-borne Rickettsial infections, and reactions to drugs and vaccinations. Immune-mediated diseases can vary in severity and each patient responds differently to the medications necessary to control the disease. The immune-mediated diseases we commonly see are immune-mediated thrombocytopenia (ITP), immune-mediated hemolytic anemia (IMHA), immune-mediated polyarthritis (IMP), immune-mediated neutropenia (IMN), and immune-mediated destruction of red blood cell precursors/pure red blood cell aplasia.

Diagnostic work-up is unique to each disease process, however, there are certain common diagnostic tests recommended for all of the immune-mediated diseases. Chest X-rays and abdominal ultrasound allow us to rule out cancerous etiologies. An anti-nuclear antibody test (ANA) is run to search for Lupus, and serum titers are run for Rickettsial infections. Additional work-up may include a Coomb's test looking for antibodies on red blood cells in cases of IMHA, a reticulocyte count to evaluate for the bone marrow's response to anemia, bone marrow aspirate examination, and joint taps to search for inflammatory changes consistent with polyarthritis. If an underlying cause is found for the immune-mediated disease, primary treatment of that underlying disease is recommended to aid in the therapy of the patient. Regardless of the underlying disease, however, immunosuppressive therapy will be necessary to stop the immune system from attacking itself.

Drugs used for these diseases vary, however, the majority are placed on high dosages of steroids, azathioprine (Imuran), and cyclosporine. Side effects of the drugs are common, however, the drugs are tapered as the immune system responds and the patient improves. Our goal is to use the lowest dosages of drugs possible to control the disease while causing the least amount of side effects possible. Steroids will cause excessive thirst and urination, excessive hunger, and possibly panting, hair loss, muscle weakness, and liver enlargement. Azathioprine is generally well-tolerated, however, idiosyncratic reactions can occur causing low blood cell counts, liver

toxicity, and pancreatitis. Cyclosporine can cause gastrointestinal side effects manifesting as inappetence, vomiting, and diarrhea. All of these drugs can lead to the development of secondary infections as they are suppressing the immune system. Again, these drugs are tapered to the lowest dosage possible to control the underlying disease and to minimize the side effects on the patient.

Prognosis varies with type of disease. The most severe cases are ITP and IMHA with a 75% chance for survival for ITP and a 50% chance for survival with IMHA. In the literature, patients with immune-mediated destruction of red blood cell precursors have a better prognosis than IMHA patients with greater than 75% survival, however, it can take prolonged therapy to induce remission and these patients may require multiple blood transfusions during this time. The majority of IMP and IMN cases do quite well with therapy, although occasionally cases can be refractory to therapy.

Regardless of the cause, these immune-mediated diseases can be expensive and frustrating to treat. The medications used will cause side effects in the short-term, but these will resolve as the drugs are tapered to the lowest dosage possible to control your pet's disease.