

Vestibular Disease

What is the vestibular system?

The vestibular system is the sensory system that functions to maintain an animal's balance and normal orientation relative to the earth's gravity. It has two main functions: 1) To maintain balance by stabilizing the position of the head in space and 2) maintaining a steady visual image by stabilizing the eyes during head movement. The sensory receptors are located in the inner ear. The receptors send messages to parts of the brain involved in coordinating balance, specifically the brain stem and cerebellum. There is extensive integration of neural information that leads to coordinated eye movements, proper head and limb position and normal limb tone.

What are signs of vestibular disease?

When the vestibular system is malfunctioning common signs include a head tilt, nystagmus (rhythmic eye twitching), circling/falling/rolling in one direction, and/or nausea/vomiting/inappetence. Some patients may also have other signs depending on where in the vestibular system the problem is located. For example, patients with an inner infection may have a small pupil or a protruding third eyelid on the affected side.

Peripheral vs. Central Vestibular Disease

The neurological examination becomes an important tool for localizing the problem to either the inner ear (peripheral vestibular disease) or a problem inside the brain (central vestibular disease). Historical information provided by you, in combination with the neurological examination, help to define the more likely causes for the vestibular disease in an individual patient.

Diagnostic testing

Diagnostic tests recommended for patients with vestibular disease depend on the history, breed and age of the patient and whether the problem appears to involve the peripheral or central vestibular system. Testing may include one or more of the following: looking down the ear canal with an otoscope, basic blood work and urine analysis, a serum thyroid level, blood pressure, chest x-rays +/- abdominal ultrasound, advanced imaging of the vestibular system (MRI or CT scan), cerebrospinal fluid analysis, and possibly a Brain stem Auditory Evoked Response (BAER) test (special electrical testing of the inner ear and brainstem).

Common causes of Peripheral Vestibular Diseases

Ear infection (Otitis Media-Interna): This is a common cause of peripheral vestibular disease in dogs and cats. This is usually caused by a bacterial infection in the middle ear that travels to the inner ear. Affected animals may or may not have signs of external ear infection such as head shaking, rubbing or scratching at the ear(s), and pain. Chronic ear infections may lead to other nerve problems causing facial weakness and Horner's Syndrome (a small pupil, retracted globe, and a protruding third eyelid) on the affected side. Depending on the severity of the problem, treatment may involve medical or surgical

management. Clinical signs may still be present after resolution of infection due to permanent damage.

Canine Idiopathic Vestibular Syndrome (aka “Old Dog” Vestibular Disease): This is also a common cause of peripheral vestibular disease in dogs. This disorder usually seen in older dogs but dogs of any age may be affected. Idiopathic means that the cause for the disease is unknown. Patients develop a sudden onset of a head tilt, eye twitching, “drunken” gait or may even be unable to rise when severely affected. They may also vomit due to the motion sickness caused by the imbalance of the vestibular system. There is usually spontaneous recovery within a few days to weeks, although residual signs such as a head tilt may persist. Many dogs cannot eat or drink on their own because they have difficulty maintaining an upright posture and may require extensive nursing care in the short term. There is no specific treatment, however, some patients will benefit from anti-nausea medication, valium, intravenous fluid support, +/- nursing care for patients that can't walk on their own. Rarely dogs may have future vestibular episodes.

Feline Idiopathic Vestibular Syndrome: This can occur in cats of any age and affects outdoor cats more frequently. It is more common in the summer and fall months. Clinical signs are similar to canine idiopathic disease although vomiting is not common. Diagnosis is based on exclusion of other causes of peripheral vestibular disease. They also spontaneously recover within a few weeks.

Nasopharyngeal Polyps: This is common in cats 1 to 5 years old. A polyp is a fleshy-like mass that originates from the auditory tube or the wall of the middle ear. It can cause secondary infection or inflammation of the middle and inner ear. The patient may also present with signs of sneezing and gagging since the polyp can grow into the back of the throat. Polyps can usually be removed surgically but they may recur. The prognosis after surgical correction is good.

Other causes of peripheral vestibular disease are cancer in the ear canal and drug toxicity (topical drugs placed in the ear). Even when animals do not recover fully from peripheral vestibular syndrome they usually have good quality of life.

Central Vestibular Disease

Brain tumors, stroke-like events, drug toxicities (such as metronidazole and ronidazole), nutritional deficiencies, infections (such as Distemper, Feline Infectious Peritonitis, Toxoplasma gondii, Neospora caninum, and fungal infections) or diseases that cause inflammation of the brain (such as granulomatous meningoencephalitis), are common causes for central vestibular disease in both the dog and the cat.

If your veterinarian or veterinary neurologist suspects central vestibular disease, further diagnostics will be needed to initiate appropriate treatment.