



# VESTIBULAR DISEASE

## ***WHAT IS THE VESTIBULAR APPARATUS?***

In a nutshell, the vestibular apparatus is the neurological equipment responsible for perceiving one's body's orientation relative to the earth (determining if you are upside-down, standing up straight, falling etc.) and informing one's eyes and extremities how they should move accordingly. It's is our body's gyroscope.

There are two sets of receptors involved: one to detect rotational acceleration (tumbling or turning) and one to detect linear acceleration and gravity (falling and letting us know which direction is up and which is down). Both receptors are located in the middle ear. Tiny neurological hair cells project into special canals of fluid so that when one's head moves, the fluid moves, and the hair cells wave within the fluid. The hair cells are part of sensory nerve cells which carry the appropriate message to the cerebellum (part of the brain that coordinates locomotion). From the brain, instructions are carried by nerve cells to the legs and neck muscles, and eye muscles so that we may orient ourselves immediately.

## ***WHAT ARE THE SIGNS OF VESTIBULAR DISEASE?***

If there is trouble in the vestibular apparatus, one may not properly perceive one's orientation. To put it more simply, one won't know which way is up, whether or not one is standing up straight or slanted, and one will feel very dizzy.

The following are signs of vestibular disease: ataxia (stumbling and staggering around), motion sickness, nystagmus (back and forth or rotational eye movements), and head tilt



**Dog displaying signs of Geriatric Vestibular Disease**

## ***CAUSES OF VESTIBULAR DISEASE***

In order to determine prognosis and choose treatment, one needs to figure out what has happened to the vestibular system. The first step is to determine whether the lesion is central (in the brain) or peripheral ( in the inner ear). There will be some hints in the clinical presentation.

*Canine idiopathic vestibular disease* (also called "Geriatric Vestibular Disease") and, its feline counterpart, Feline Idiopathic Vestibular Disease begin acutely and resolve acutely. Some owners may un-necessarily want to have their pet euthanized because of what they perceive to be an incurable disease. Actually, the prognosis is good and treatment is usually given to calm the animal so that it won't injure itself. Usually improvement is evident in 72 hours and the animal is normal in 7-14 days, possibly with an occasional head tilt persisting. These two conditions are idiopathic, meaning we do not know why they occur. We do know that they represent problems in the peripheral nerves of the middle ear rather than in the actual brain.

### **Other Causes of Vestibular Disease**

Middle ear infection is a likely possibility for vestibular disease especially if the patient has a history of ear infections. When an otoscope is used to visualize the external ear of an animal with vestibular disease and debris is seen, this would be a good hint that there is an infection in the middle ear as well. However, just because debris is not seen in the external ear does not mean that a middle ear infection is unlikely. Special imaging of the middle ear bones may be in order. If a middle ear infection is present but is not known to be present, a routine cleaning of the external ear can lead to a flare up of vestibular symptoms. This is often unavoidable in long standing ear infections.

Brain tumors can be a cause of vestibular disease if the signs fit with a central lesion. In these cases, special imaging as mentioned above is needed to make the diagnosis. Such tumors may be treatable depending on their location.

Encephalitis (inflammation of the brain) can lead to lateralizing signs such as vestibular disease. Examples are viral infections such as Canine Distemper and Feline Infectious Peritonitis.

Hypertension disease is rare in dogs and cats therefore vestibular signs from a infarction or hemorrhage (so called “stroke”) are very rare.

