

VESTIBULAR DISEASE



WHAT ON EARTH IS THE VESTIBULAR APPARATUS?

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

The vestibular apparatus allows us to walk on uneven ground without falling, know when we need to right ourselves, and allows our eyes to follow moving objects without becoming dizzy.

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 hair cells project into special canals of fluid so that when the head moves, the fluid moves. The hair cells wave within the fluid (imagine plants swaying in the ocean current). The hair cells are part of sensory nerve cells that carry the appropriate message to the cerebellum (the part of the brain that coordinates locomotion) and to 4 vestibular nuclei in the brain stem.

From these centers, instructions are carried by nerve cells to the leg, neck, and eye muscles so that we may orient ourselves. The information about being upside down (or in some other abnormal orientation) is also sent to the hypothalamus (another area of the brain) so that we can become consciously aware of our position. The information is also sent to the "reticular formation" – a part of the brain that is a sort of volume control on our state of wakefulness. In this way, if we are asleep and start to fall, the vestibular stimulations would wake us up.

THE SIGNS OF VESTIBULAR DISEASE

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

The following are signs of vestibular disease: (Your pet may not have all of these, depending on the cause and severity of her disease)

- ataxia (lack of coordination without weakness or involuntary spasms - in other words, stumbling and staggering around)
- motion sickness, sometimes vomiting
- nystagmus (back and forth or rotational eye movements).
- Circling (walking in a circle instead of a straight line)
- Head tilt (usually toward the affected side of the head)
- Falling to one side (usually toward the side of the lesion)

- Trouble with other nerves controlling the head and face

CAUSES OF VESTIBULAR DISEASE

In order to determine prognosis and choose treatment, we need 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 signs. For example, if other cranial nerves are involved and they are on the side opposite from the head tilt, then the lesion is likely to be in the cerebellum (central). If the nystagmus is vertical (the eyes are moving up and down rather than back and forth) or only exists when the animal is placed in certain positions, then the lesion is more likely to be central.

Canine idiopathic vestibular disease (also called "Old dog vestibular disease") and, its feline counterpart, feline idiopathic vestibular disease, begin suddenly and resolve relatively quickly. Usually improvement is seen within 72 hours and the animal is normal in 7-14 days, possibly with an occasional head tilt persisting. Idiopathic means we do not know why it occurs. We do know that the idiopathic form represents problems in the periphery (nerves of the middle ear rather than in the actual brain.)

Idiopathic vestibular disease is the most common form in both dogs and cats. Other possibilities include a stroke, infection in the brain or middle ear, or a tumor affecting the brain or middle ear. In general, we examine the ears carefully for signs of inner ear infection and if none is present we assume the pet has idiopathic disease. If improvement isn't noted within a few days we may need to investigate further. In order to make your pet as comfortable as possible during an episode of idiopathic vestibular disease, we treat affected pets with anti-nausea medication if needed. If dehydration is present we will treat with fluids. You will need to provide some supportive care to help your pet to get around and you may need to hand feed for a few days.

Middle ear infection is more likely 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 is a good hint that there is 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 or isn't present. If we suspect your animal has a middle ear infection, we may do imaging studies such as a CT scan or treat with antibiotics.

Vestibular disease is a highly unpleasant and even debilitating condition for pets. However, the vast majority of the time it is very temporary, requiring only patience, symptomatic treatment and tender loving care.

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