Head Tilt (Wry Neck, Torticollis)

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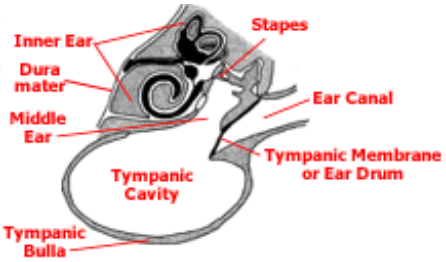
Head tilt may also be known as "wry neck," or the scientific terms "torticollis," or "vestibular disease." It is a fairly common condition in rabbits, with multiple causes.

What are the signs of head tilt?

The rabbit will tilt his head down on the side that is affected. The onset may be gradual, or come about suddenly. In severe cases, the rabbit may be incoordinated, roll, move in circles, or be unable to stand. Depending upon the cause, some rabbits will shake their heads, lose their appetite (anorexia), become lethargic and depressed, develop deafness, or have nystagmus in which the eyes move rapidly from side-to-side or up-and-down. Rabbits may become nauseated, in which case they generally will not eat, and may salivate excessively or grind their teeth. There may also be facial paralysis if various nerves are also involved. In these cases, the ear may droop. Signs may also include a drooping lip, drooling, sunken eye, loss of a blink reflex, and the third eyelid may cover a portion of the eye.



To better understand the signs, it helps to understand the anatomy of the ear and how it relates to the nerves and brain. The external ear is the visible portion of the ear and includes the first portion of the ear canal. The midde ear includes the tympanic membrane (ear drum), tympanic cavity which is surrounded by the bony tympanic bulla, the eustachian tube, 3 small bones including the stapes, and the tympanic nerve. The inner ear includes the cochlea, vestibule, semicircular canals, and the vestibulocochlear nerve. These organs of the inner ear make up the vestibular apparatus, which is the area of the ear that is responsible for balance and equilibrium. All that separates it from the brain is a tough membrane called the dura mater. In addition to the ear, portions of the brain are involved in the perception of hearing and balance.

What are the causes of and related treatments for head tilt?

There are multiple causes of head tilt, and these affect either the inner ear, nerves, brain, or a combination of sites.

Bacterial infections of the middle or inner ear: *Pasteurella multocida*, a bacteria which infects rabbits and commonly causes a respiratory disease called "snuffles," can also cause middle or inner ear infections. Other bacteria which can infect the ear include *Staphylococcus sp, Pseudomonas aeruginosa*, *Bordetella bronchiseptica*, *Proteus mirabilis*, *Streptoccus epidermidis*, *Bacteroides sp.*, and *Escherichia coli*. By using an otoscope to examine the ear, a veterinarian may see a swollen or ruptured ear drum. To confirm the diagnosis of middle or inner ear infection, the ear may be cultured and a sensitivity (culture and sensitivity) performed. The head may also be radiographed to determine the extent of the infection. If there is an accumulation of pus, the area enclosed in the tympanic bulla may need to be surgically drained. Ear infections may be so severe as to cause abscesses in the brain.

To treat middle and inner ear infections, the ear may be flushed with a saline solution to loosen debris and pus. These middle and inner ear infections are treated with systemic (oral or injectable) antibiotics such as chloramphenicol, enrofloxacin, and trimethoprim-sulfa for several weeks or months. Antibiotics must be used with care in the rabbit; the wrong type or dose can affect the bacteria in the digestive tract, and result in severe digestive disturbances. An oral *Lactobacillus* or *Acidophilus* product may be given to lessen the effects of the antibiotics on the digestive system. If the tympanic membrane (ear drum) is ruptured, topical antibiotics in the ear are not used.

Encephalitozoonosis: *Encephalitozoon cuniculi* is a protozoan (single-celled) parasite that infects the kidney and brain. It causes inflammation of the brain (meningoencephalitis) and can result in paralysis anywhere in the body. In addition to head tilt, you may also see behavior changes, staggering, and seizures. It is transmitted through the urine. The onset of signs of infection with *E. cuniculi* are frequently gradual. There is a blood test for antibodies to *E. cuniculi* that can determine whether a rabbit has been exposed. Unfortunately, a positive test is not diagnostic since many (up to 80%) of rabbits may test positive for this parasite.

The treatment of *E. cuniculi* infections includes certain wormers including albendazole, fenbendazole and oxibendazole along with dexamethasone or other corticosteroid.

Ascarid migration (cerebral larval migrans): The raccoon roundworm, *Baylisascaris procyonis*, can infect the brain of many mammals including dogs, rabbits, and humans. The migrating larvae of the worm cause damage and inflammation in the brain. It is extremely difficult to positively diagnose this disease until a post-mortem examination can be performed.

There is no specific treatment for infection with *B. procyonis.* Again, corticosteroids may be given along with supportive care.

Toxins: Several toxins can cause neurological signs, including head tilt. These include heavy metals such as lead and zinc which may be found in paint, the welds in cages, and pottery. Exposure to certain insecticides can result in toxicity with head tilt being a common sign.

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Certain plants and mushrooms are toxic to rabbits and can also affect the nervous system. If the liver is diseased, toxins such as ammonia can build up in the bloodstream and cause neurologic signs.

Treatment of toxicities depends upon the specific toxin. For heavy metal poisonings, chelation therapy aids in removing the lead from the body. Chelation agents include succimer (DMSA), dimercaprol (BAL), calcium EDTA, and penicillamine. Thiamine (vitamin B1) may also be given. External exposure to a pesticide is treated by repeatedly bathing and rinsing the rabbit and providing supportive care. Liver disease may be treated with medications and diet changes.

Stroke: Strokes, or cerebrovascular accidents, are not as common in pets as they are in humans. Diagnosis of a stroke is difficult, often requiring sophisticated imaging techniques such as CAT scans, or MRIs. The diagnosis in animals is often made by ruling out other causes of the signs of disease.

There is no specific treatment for a stroke. Heparin may be administered, and supportive care given in the form of fluids, assisted feedings, and pain medication. Depending upon the extent of the brain damage, the rabbit may partially recover over a period of weeks.

Trauma: Injury to the brain or neck may result from a blow to the head, a fall, or other trauma. It may also cause bleeding in the middle or inner ear. The extent of the signs depends upon the extent of the damage.

Brain or ear trauma is generally treated with supportive care. Medications may be used to decrease the swelling in the brain.

Mite infestation: Rabbits are prone to infection with the rabbit fur mite, *Cheyletiella parasitovorax*, which can also affect the ears. Ear mite infestations alone would rarely cause head tilt, but if severe, can lead to bacterial ear infections which are a common cause of head tilt.

Mite infections are often treated with ivermectin. Secondary bacterial infections would need to be treated with antibiotics.

Cancer: Cancer of the brain or ear is rare in rabbits, but it can occur and result in signs including head tilt.

There generally would be no treatment for this type of cancer other than supportive care.

Nutritional imbalances: Abnormal levels of vitamins A, B, and/or E can produce neurologic effects, as can mineral imbalances, e.g.; selenium and copper.

Treatment would be primarily based on correcting the imbalance through dietary changes and supplements. Supportive care may also need to be provided.

What long-term supportive care should be given to rabbits with head tilt?

In many cases, the recovery from head tilt may take weeks, and may not be complete, as neurologic damage is often permanent. Therefore, affected rabbits usually need special care to make them comfortable.

Preventing further injuries: Especially in cases where there is facial paralysis, the eyelids may not be able to close and the eyes will need to be protected. Litter which may contain excessive dust should be removed. The eyes will need to be protected with ointments or artificial tears, and the nails should be trimmed. The rabbit may also need to be confined to a smaller cage to protect her from injuring herself due to incoordination or rolling. Any protruberances in the cage that could cause injury should be removed and blankets and towels can be used to provide soft surfaces.

Rabbits that are severely affected and are unable to move to a great extent can develop decubital ulcers (bed sores). In an effort to prevent these, make sure the rabbit is on a soft surface and turned from side to side multiple times each day. Urine or feces on the skin and fur can cause inflammation, pain, and result in secondary bacterial infections, so keep the anal area clean and dry.

The rabbit should be encouraged to exercise, if he is able, since this may increase the appetite, help with digestion, maintain good muscle tone, and prevent joint stiffness. Gently flexing and extending the limbs during several sessions each day, as well as massage, may also be beneficial. Acupuncture and chiropractic treatments have also been tried.

Providing food and water: Some rabbits with head tilt will not be able to eat, or may have a decreased appetite. Supply plenty of fresh vegetables and greens to entice them. Some may need to be fed by syringe. Have your veterinarian or veterinary technician show you how to do this. Improper syringe feeding could result in aspiration of the food and pneumonia. A medication called Meclizine (Anti-Vert) may be prescribed by your veterinarian to reduce dizziness and the accompanying nausea.

As you may know, rabbits pass special droppings called cecotropes which they eat. They differ from other droppings in that they have a a mucous coating and are generally passed as an elongated mass. It is necessary for rabbits to eat them in order to more fully digest their food and obtain more of its nutritional value. Depending upon the severity of the condition, a rabbit may be unable to reach the anal area and the cecotropes. The cecotropes can be collected and placed in an area where the rabbit can reach them.

The rabbit should be monitored for his ability to drink. He may be unable to use a water bottle, and the water bowl may more easily be tipped over or become contaminated with droppings. The rabbit will have less control of his head movements, so do NOT use a very large or deep bowl, which may make him more prone to aspirate while drinking. Instead, provide a heavy and shallow bowl. Food dishes, too, may need to be shallow. Observe the rabbit to determine at what height the bowls should be to provide the best access.

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Having patience: Recovery from head tilt may take weeks, though there should be some improvement after several days of treatment. Some rabbits may fully recover, others may not. Rabbits who are permanently disabled are not necessarily unhappy. If your rabbit is eating and drinking, trying to groom, and moving about as best he can, he is showing signs he is recovering and enjoying life. If however, he has no appetite, is lethargic and depressed, and unresponsive to you, you should consult with your veterinarian to determine if the rabbit is in pain, what the long-term prognosis is for the rabbit, and what will be best for him.

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