

## About Laryngeal Paralysis

### INCIDENCE

Acquired late-onset laryngeal paralysis/acquired peripheral neuropathy is a frequent cause of increased respiratory noise in older dogs. At UW Veterinary Care, surgeons treat many older dogs every year for this condition. It is common for patients in respiratory distress to require surgery to open the airway and prevent life-threatening airway obstruction.

### CAUSES

Acquired laryngeal paralysis is a genetic disease, which is particularly common in the Labrador Retriever, although it can occur in many other breeds as well. Although the paralysis of the laryngeal nerves is most dramatic, the disease is actually a result of a generalized degenerative neurologic disease, in which motor nerve fibers that run from the spinal cord directly to muscles undergo degeneration. The laryngeal muscles and the hindlimb muscles are affected most severely, and in some dogs the esophagus can also become affected. Paralysis of the laryngeal muscles leads to respiratory obstruction. Nerve degeneration progresses over time.

### CLINICAL SIGNS

Laryngeal paralysis is a part of a generalized neurologic disease. Common clinical signs may include:

- Reduced exercise tolerance
- Noisy breathing, which may be described as “roaring” or sounding like a train.
- A change in the sound of a dog’s bark
- Weakness of the rear legs, which may present as dogs having a hard time jumping or climbing stairs
- Coughing while eating or drinking

### TREATMENT GOALS AND OPTIONS

The goal of treatment for pets with laryngeal paralysis is to help these older dogs maintain a high quality-of-life by preventing episodes of respiratory distress or suffocation.

### CONSERVATIVE MANAGEMENT

Laryngeal paralysis can often be managed conservatively by modification of the dog’s activity. Affected dogs should be kept cool and rested. Dogs can not be permitted to go outside on hot days.

### SURGICAL TREATMENT

The goal of surgery is to prevent the larynx from becoming obstructed by permanently a larger airway opening by suturing the larynx open. This surgical procedure is known as arytenoid lateralization, also commonly referred to as a “tie-back”. By permanently opening the larynx, air is allowed to move more easily during normal breathing. Potential risks associated with surgical treatment include complications such as the development of pneumonia. In some instances life style changes are required.

Surgery does not cure the degenerative neurologic process that causes laryngeal paralysis, but is effective at opening the airway and improving quality of life.

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## Genetic Basis of Acquired Laryngeal Paralysis



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# Genetic and Pathologic Basis of Laryngeal Paralysis

## STUDY INFORMATION

### BACKGROUND

Laryngeal paralysis is a disease most commonly diagnosed in older (9-13+ years) Labrador retrievers and Golden Retrievers, although other breeds can be affected. Laryngeal paralysis most commonly part of a generalized progressive neurologic disease that affects motor nerve fibers; therefore, a more accurate term for this condition is “acquired peripheral neuropathy.” Although we now know the condition is genetic, the specific gene mutation(s) is not known.

### RESEARCH OBJECTIVES

The ultimate goal of this work is to understand the genetics and neuropathology of laryngeal paralysis in dogs. Doing so will allow for the development of medical treatment for these animals and provide a model for similar conditions that affect people. Currently, there are no treatments available for people or dogs with this type of neurodegenerative disease.

This study has three main objectives.

- 1) Create a genetic test for laryngeal paralysis in the Labrador and Golden Retriever.
- 2) Determine whether this test is applicable to other breeds.
- 3) Determine the specific gene and mutation associated with laryngeal paralysis in dogs.
- 4) Determine the neuropathology and its progression in dogs with laryngeal paralysis.

Understanding the genetic mutation associated with laryngeal paralysis is the first of two steps to fully unraveling the disease. A separate portion of this work will be focusing on understanding the degenerative changes that nerves in affected dogs undergo over time.

### GENOMIC SEQUENCING

The Dog Genome Sequencing Project was completed in 2005. We have used a genome-wide association study (GWAS) to locate a genetic marker for laryngeal paralysis in Labrador Retrievers, through which a genetic screening test has been developed for the disease. Currently, GWAS is being used to investigate a variety of canine diseases.

### WHY IS THIS IMPORTANT?

Currently, we have identified a genetic locus (region of DNA) that significantly correlates with the laryngeal paralysis condition in the Labrador Retriever. We are now working towards finding the genetic mutation that causes laryngeal paralysis. This work is expected to result in the development of a highly sensitive and specific diagnostic test for laryngeal paralysis that can be used to inform breeding and patient management.

We are currently working to determine if the genetic marker associated with laryngeal paralysis in Labradors Retrievers is also associated with the disease in other breeds, with a focus on the Golden Retriever. This will allow us to determine whether the genetic test can be used for breeds other than the Labrador Retriever.

Importantly, it has long been established that dogs and humans share a similar profile of diseases, including degenerative neurologic disease that can result in laryngeal paralysis. The results of this research in dogs is expected to be also help understand and inform treatment of human patients with a similar genetic disease.

## “CAN MY DOG PARTICIPATE?”

### PEDIGREE INFORMATION

If your dog is AKC registered, we would like to use the AKC number to check the pedigree of your dog. If your dog is not registered, we could use the AKC registration numbers of his/her parents or the Certificate of Pedigree provided by your breeder.

**DOGS AFFECTED WITH LARYNGEAL PARALYSIS** can be of any age and must have had either a previous arytenoid lateralization procedure or currently have clinical signs consistent with laryngeal paralysis.

**UNAFFECTED DOGS** must be **12.5 years of age or older** and have no history of increased respiratory noise or evidence of neurologic abnormalities.

### IF YOUR DOG PARTICIPATES IN THE STUDY, WE WILL COLLECT THE FOLLOWING:

- A small blood sample from your dog
- A neurologic examination will be performed
- In some circumstances, a sedated airway examination may be performed to assess if your dog is affected or unaffected
- In dogs that are determined to be neurologically normal, we may ask to recheck your pet every 6-12 months to confirm that he/she remains unaffected by the disease

### WHAT IF I DON'T LIVE NEAR MADISON WISCONSIN?

We are looking for dogs from all over the US and Canada to help us with this study! If you would like to participate, we will send you a package with saliva swabs for DNA collection, a permission form and a questionnaire about your dog's medical history, along with packaging to send material back to us.