**Centronuclear Myopathy** (other names: CNM, Hereditary Myopathy of the Labrador Retriever, Type II Muscle Fiber Deficiency)

Centronuclear Myopathy is an inherited progressive muscle disease affecting Labrador retrievers. Though the severity of symptoms is variable, affected dogs typically present between 6 weeks to 7 months of age with exercise intolerance, awkward gait and difficulty eating. As the disease progresses, symptoms also include generalized muscle atrophy, downward flexion of the head and neck, low muscle tone and more frequent episodes of collapse when exposed to cold temperatures. Progression of the disease tends to stabilize around one year of age and dogs typically have a normal life span, but affected dogs usually have life-long medical problems due to the underlying muscle disease.

**Degenerative Myelopathy** (other names: DM, Canine Degenerative Myelopathy)

Degenerative Myelopathy is an inherited neurologic disorder caused by a mutation of the SOD1 gene known to be carried by Labrador retrievers. This mutation is found in many breeds of dog, though it is not clear for Labrador retrievers whether all dogs carrying two copies of the mutation will develop the disease. The variable presentation between breeds suggests that there are environmental or other genetic factors responsible for modifying disease expression. The average age of onset for dogs with degenerative myelopathy is approximately nine years of age. The disease affects the white matter tissue of the spinal cord and is considered the canine equivalent to amyotrophic lateral sclerosis (Lou Gehrig’s disease) found in humans. Affected dogs usually present in adulthood with gradual muscle atrophy and loss of coordination typically beginning in the hind limbs due to degeneration of the nerves. The condition is not typically painful for the dog, but will progress until the dog is no longer able to walk. The gait of dogs affected with degenerative myelopathy can be difficult to distinguish from the gait of dogs with hip dysplasia, arthritis of other joints of the hind limbs, or intervertebral disc disease. Late in the progression of disease, dogs may lose fecal and urinary continence and the forelimbs may be affected. Affected dogs may fully lose the ability to walk 6 months to 2 years after the onset of symptoms. Affected medium to large breed dogs, such as the Labrador retriever, can be difficult to manage and owners often elect euthanasia when their dog can no longer support weight in the hind limbs.

**Exercise-Induced Collapse** (other name: EIC)

Exercise-Induced Collapse (EIC) is an inherited neuromuscular disorder affecting Labrador Retrievers. EIC presents as exercise intolerance in apparently healthy dogs. Affected dogs are usually diagnosed before two years of age and appear normal during low to moderately strenuous activity. However, shortly after 5-20 minutes of strenuous exercise affected dogs will begin to walk with a wobbly, uncoordinated gait that often only affects the hind limbs. Dogs remain mentally alert and are not in pain during episodes of EIC. In some circumstances, the symptoms of EIC can progress to full body weakness with low muscle tone (flaccid paralysis), confusion, loss of consciousness, seizures and very rarely, death. The episodes typically last 5-10 minutes and most dogs will completely recover within 15-30 minutes.

**Progressive Retinal Atrophy** (other names: PRA-PRCD, PRCD)

Progressive retinal atrophy, progressive Rod-cone degeneration (PRA-PRCD) is a late onset, inherited eye disease affecting Labrador Retrievers. PRA-PRCD occurs as a result of degeneration of both rod and cone type Photoreceptor Cells of the Retina, which are important for vision in dim and bright light, respectively. Evidence of retinal disease in affected Labrador Retrievers can first be seen on an Electroretinogram around 1.5 years of age, but most affected dogs will not show signs of vision loss until 4 to 6 years of age or later. The rod type cells are affected first and affected dogs will initially have vision deficits in dim light (night blindness) and loss of peripheral vision. Over time affected dogs continue to lose night vision and begin to show visual deficits in bright light. Other signs of progressive retinal atrophy involve changes in reflectivity and appearance of a structure behind the retina called the Tapetum that can be observed on a veterinary eye exam. Although there is individual and breed variation in the age of onset and the rate of disease progression, the disease eventually progresses to complete blindness in most dogs. Other inherited disorders of the eye can appear similar to PRA-PRCD. Genetic testing may help clarify if a dog is affected with PRA-PRCD or another inherited condition of the eye.

**Retinal Dysplasia/Oculoskeletal Dysplasia 1** (other names: RD/OSD, Dwarfism with Retinal Dysplasia 1, Inherited Retinal Dysplasia, Oculoskeletal Dysplasia 1, Retinal Dysplasia, DRD1, OSD1, RD)

Retinal Dysplasia/Oculoskeletal Dysplasia 1 is an inherited Collagen disorder affecting Labrador retrievers. Dwarfism and eye abnormalities may be apparent as early as 4 to 6 weeks of age in affected puppies. The dwarfism is characterized by shortened forelimbs that become curved as the dog grows. In puppies, the top of the head may be noticeably dome shaped compared to littermates. A range of eye abnormalities is visible on a veterinary eye exam of which retinal detachment and cataracts are the most common. Carrier dogs do not have skeletal changes but may have mild eye abnormalities, including retinal folds.

**Skeletal Dysplasia 2** (other names: Dwarfism, SD2)

Skeletal Dysplasia 2 is an inherited Musculoskeletal disease affecting Labrador Retrievers. Affected dogs develop a mild form of “disproportionate dwarfism” consisting of short legs with normal body length and width. The leg bones are shorter, thicker, and slightly curved and the front legs are frequently more affected than rear legs. Joints and eyes are not typically affected with this disease. The height of affected dogs is variable, making diagnosis based on physical characteristics alone challenging in some individuals. Mildly affected dogs from bloodlines known to produce large dogs may still fall within their breed standard for height. The causal Mutuation shows Incomplete Penetrance meaning that not all dogs inheriting two copies (one from each parent) will display obvious physical characteristics of dwarfism.

**Cystinuria** (other name: Type IA Cystinuria)

Cystinuria (Labrador retriever type) is an inherited disease affecting kidney function in Labrador retrievers. The SLC3A1 gene codes for a protein that allows the kidneys to transport cystine and other amino acids from the urine. Normal kidneys reabsorb the Amino Acid cystine so that only small amounts pass into the urine, while dogs with mutations of both copies of the SLC3A1 gene fail to reabsorb cystine allowing large amounts to pass into the urine, hence the name cystinuria. Cystine can form crystals and/or stones in the urinary tract, which can block the ureters or Urethra and stop the normal flow of urine. Affected male dogs typically present with symptoms related to cysteine bladder stones at 6 to 14 months of age, however female dogs tend to develop symptoms later than males. Symptoms of disease include straining to urinate, frequent urination of small volumes or inability to urinate. In Labrador retrievers, males and females are equally affected with excess cysteine in the urine, but obstruction of urine flow is more common in males due to differences in anatomy and females tend to develop stones about a year later than males on average. Dogs with cystinuria often have recurrent inflammation of the urinary tract and if not treated, urinary stones can cause urinary tract infections, kidney failure and even death.

**Hereditary Nasal Parakeratosis** (other name: HNPK)

Hereditary Nasal Parakeratosis is an inherited disease affecting the nose of Labrador Retrievers. Beginning around 6 to 12 months of age, affected dogs develop dry, rough, gray to brown crusts and rarely, painful cracks on the tip of the nose. In some cases, lesions are also present on the haired area around the nose. The noses of affected dogs are prone to superficial bacterial infections and often become depigmented over time. Affected dogs are otherwise healthy. Symptoms often wax and wane in severity over the dog’s life. Though manageable, this disorder requires continuous topical therapy to prevent recurrence of excessive nasal crusting.