Degenerative Myelopathy

Affected breeds: Australian Shepherd, Bernese Mountain Dog, Bloodhound, Borzoi, Boxer, Cardigan Welsh Corgi, Cavalier King Charles Spaniel, Chesapeake Bay Retriever, Cross-breed, Dalmatian, French Bulldog, German Shepherd, Golden Retriever, Hovawart, Jack Russell Terrier, Kerry Blue Terrier, Labrador Retriever, Nova Scotia Duck Tolling Retriever, Pembroke Welsh Corgi, Poodle, Pug, Rhodesian Ridgeback, Shetland Sheepdog, Soft-coated Wheaten Terrier, Standard Poodle, Wire Fox Terrier

Degenerative Myelopathy (DM) (also known as chronic degenerative radiculomyelopathy) is a progressive disease of the spinal cord. The disease has an insidious onset, typically between 7 and 14 years of age.
Degenerative myelopathy initially affects the back legs and causes muscle weakness and loss, and lack of coordination. These early signs may resemble arthritis. The dog may drag one or both rear paws when it walks. This dragging can cause the nails of one foot to be worn down. The condition may lead to extensive paralysis of the back legs. As the disease progresses, the animal may display symptoms such as incontinence and has considerable difficulties with both balance and walking. If allowed to progress, the animal will show front limb involvement and extensive muscle atrophy. Eventually cranial nerve or respiratory muscle involvement necessitates euthanasia. Progression of the disease is generally slow but highly variable. The animal could be crippled within a few months, or may survive up to three years.

Degenerative myelopathy is caused by a recessive genetic mutation, but the DNA test result is not absolutely indicative of disease. This means that CLEAR dogs, and those which carry the mutation ("CARRIERS") are very unlikely to show signs of disease. CARRIERS will pass the mutation on to an average of 50% of their offspring. Puppies which inherit two copies of the mutation ("AFFECTED"), are likely to develop Degenerative Myelopathy.

This test is particularly useful for breeders:

- To identify carriers among their breeding stock so that they can avoid CARRIER X CARRIER mating combinations which would risk AFFECTED puppies.

The genetic status of dogs can be used to predict breeding outcomes when different combinations are mated:

CLEAR X CLEAR = 100% CLEAR
CARRIER X CLEAR = 50% CARRIER, 50% CLEAR
AFFECTED X CLEAR = 100% CARRIER
CARRIER X CARRIER = 25% AFFECTED, 50% CARRIER, 25% CLEAR
AFFECTED X CARRIER = 50% AFFECTED, 50% CARRIER
AFFECTED X AFFECTED = 100% AFFECTED

References

Awano T, Johnson GS, Wade CM, Katz ML et al (2009) Genome-wide association analysis reveals a SOD1 mutation in canine degenerative myelopathy that resembles amyotrophic lateral sclerosis. PNAS 106(8): 2794-2799