

New Degenerative Myelopathy Test – What Does It Mean for Our Breed?

Earlier this week, the announcement was made that OFA is now offering the gene test for Degenerative Myelopathy, or DM. This is an exciting development, but one that also leaves questions behind for many.

How long does it take to get test results back?

OFA is committed to mailing the kits out within 24 hours of receiving the order. Much of the process has been automated, and you will find that the FTA card in your DM sampling kit is bar-coded. This increases the ability to use automation throughout the test ordering and test processing procedure. The current turnaround is 1-2 weeks from when the card is sent to OFA, to when you will receive results.

Is this test definitive for DM?

No, this test is for a gene that has appeared with high frequency among dogs that show symptoms of DM. It has been linked with DM in Chessies by examining cells from the spinal cords of affected dogs after they were euthanized. However, some dogs with 2 copies of the DM gene have NOT shown symptoms, and while dogs that test as carriers or non-affected are highly unlikely to develop DM, this is not yet determined to be 100% certain.

Why doesn't this test tell us with 100% certainty which dogs will be affected, like the PRA test does?

This is because the genetics behind these two diseases is very, very different. In PRA, the inheritance is very clear-cut. The form of PRA that occurs in Chessies is a single-gene mutation, meaning that only one pair of genes is responsible for PRA. Thus, if a dog does not have 2 copies of the prcd-PRA gene, it will not be affected, regardless of other factors, such as other genes or environment.

Early research into DM shows that there may be multiple genes involved with the development of DM, and possibly environmental factors as well. What this current DM test tells us is that dogs with 2 copies of the mutation are more at risk of developing DM, and those without the mutation are at less risk. More research is needed to determine what other factors may be involved with the development of DM in Chessies.

Should I breed my dog if it tests as a carrier or affected?

At this early stage in researching this disease in Chessies, it is important to not make hasty decisions. Early research indicates this gene may occur with a high frequency within the Chessie population. This, coupled with the fact that there may be other genes or environmental risk factors involved with DM, leads to no clear-cut breeding recommendations to make at this time. The ACC Health Committee recommends that breeders avoid mating two dogs together that both test as affected, and avoid where possible breeding carriers to affecteds, or to other carriers. However, this recommendation may change as further research is conducted, and more information is uncovered about how this disease affects our breed.

As with any breeding decisions, the whole dog must be taken into consideration, and focus should not be on just one condition or factor. As more Chessies are tested with this new gene test, we will get a better idea of the frequency of this gene in our population. If the early research is verified by testing of many animals, and it is found that a high percentage of animals carry this gene, it may not be practical to eliminate all carrier and affected dogs from the gene pool.

Why do we need to do more research, isn't this gene test what we were doing the research for?

The research we funded was into many things; whether Chessies actually have DM, finding out how many dogs are affected currently, and developing a gene test if it turned out Chessies do get DM. The answer to the first two questions is yes, Chessies do get DM, and we have a population of affected dogs at the current time. These affected dogs were used to help develop the current gene test.

But the research also revealed that this is a complex disease, involving perhaps several different genes, and also perhaps some environmental factors. We need to continue to do research into how DM affects Chessies specifically, and what other factors we may need to test for before determining which dogs should not be bred. Please continue to contribute funds to the ACCCT to help continue this research.

Also, if you have a dog showing DM symptoms, or one that is ten years of age or older, consider sending a blood sample to the research team. These samples will become part of this ongoing research effort, and your dog will be tested at NO CHARGE. Also, please consider sending a sample to Dr. Long, as his research is geared specifically toward discovering how DM works in our specific breed. www.amchessieclub.org/myelopathy.html

Go to OFA's web page on DNA testing www.offa.org/dnatesting and, at the bottom of the page, you will find several links to information regarding the DM test, and the ongoing research efforts. We thank everyone who has donated funds or submitted samples to help with this research effort. Your contributions are taking us one step closer to eliminating this disease from our beloved Chessie breed!

The ACC Health Committee and ACCCT will continue to bring you updates as more research is conducted, and as more dogs are tested with the OFA test.

Degenerative Myelopathy (DM)

Your dog has been tested for the mutation identifying susceptibility to Degenerative Myelopathy (DM) based on a DNA sample submission. The enclosed report lists the laboratory findings.

Explanation of results:

NORMAL (N/N): This dog is homozygous N/N, with two normal copies of the gene. In the seven breeds studied at the University of Missouri in depth so far, dogs with test results of N/N (Normal) have never been confirmed to have DM. This dog can only transmit the normal gene to its offspring, and it is unlikely that this dog or its offspring will ever develop DM.

CARRIER (A/N): This dog is heterozygous A/N, with one mutated copy of the gene and one normal copy of the gene, and is classified as a carrier. In the seven breeds studied at the University of Missouri in depth so far, dogs with test results of A/N have never been confirmed to have DM. While it is highly unlikely this dog will ever develop DM, this dog can transmit either the normal gene or the mutated gene to its offspring.

AT-RISK (A/A): This dog is homozygous A/A, with two mutated copies of the gene, and is at risk for developing Degenerative Myelopathy (DM). The research has shown that all dogs in the research study with confirmed DM have had A/A DNA test results, however, not all dogs testing as A/A have shown clinical signs of DM. DM is typically a late onset disease, and dogs testing as A/A that are clinically normal may still begin to show signs of the disease as they age. Some dogs testing A/A did not begin to show clinical signs of DM until they were 15 years of age. Research is ongoing to estimate what percentage of dogs testing as A/A will develop DM within their lifespan. At this point, the mutation can only be interpreted as being at risk of developing DM within the animal's life. For dogs showing clinical signs with a presumptive diagnosis of DM, affected (A/A) test results can be used as an additional tool to aid in the diagnosis of DM. Dogs testing Affected (A/A) can only pass the mutated gene on to their offspring.

Guidelines for Breeding

Owners with dogs testing as Carriers (A/N), or At-Risk (A/A) are strongly encouraged to share these results with their attending veterinarian and seek genetic counseling when making breeding decisions.

The "A" (mutated) allele appears to be very common in some breeds. In these breeds, an overly aggressive breeding program to eliminate dogs testing A/A or A/N might be devastating to the breed as a whole because it would eliminate a large fraction of the high quality dogs that would otherwise contribute desirable qualities to the breed. Nonetheless, DM should be taken seriously. It is a fatal disease with devastating consequences for the dog, and can be a trying experience for the owners that care for them. A realistic approach when considering which dogs to select for breeding would be to treat the test results as one would treat any other undesirable trait or fault. Dogs testing At-Risk (A/A) should be considered to have a more serious fault than those testing as Carriers (A/N). Incorporating this information into their selection criteria, breeders can then proceed as conscientious breeders have always done: make their breeding selections based on all the dog's strengths and all the dog's faults. Using this approach and factoring the DM test results into the breeding decisions should reduce the prevalence of DM in the subsequent generations while continuing to maintain and improve upon positive, sought after traits.

We recommend that breeders take into consideration the DM test results as they plan their breeding programs; however, they should not over-emphasize the test results. Instead, the test result should be one factor among many in a balanced breeding program.

Additional information on the disease can be found on the University of Missouri CVM website:

www.caninegeneticdiseases.net/DM/maindm.htm