

Update on Degenerative Myelopathy (DM) Mutations in AWS

Dear Members,

Here is concise information about Degenerative Myelopathy from Liz Hansen, University of Missouri. It is a well written and very clear explanation of the disease and what it means for American Water Spaniels now that mutations associated with the disease have been identified in our breed. --H&G Committee

Dr Joan Coates & Dr Gary Johnson & associates (University of Missouri) in collaboration with Drs Claire Wade & Kirsten Lindblad-Toh & associates (Broad Institute at MIT) have identified a mutation that is the primary risk factor for development of Degenerative Myelopathy (DM) in many breeds of dogs. DM is a spinal cord deterioration with clinical symptoms appearing in older dogs (generally 8 yrs and over). The mutation discovered in dogs is equivalent to the most common inherited form of the human disease, amyotrophic lateral sclerosis (ALS), also known as Lou Gehrig's Disease. As a result, researchers hope that DM-affected dogs can help identify therapeutic interventions for curing the human disease, as well as managing DM in dogs.

The first symptoms typically observed in dogs are dragging of the hind toes and hind limb weakness, progressing over several months to muscle wasting and a complete loss of control of hind limbs, at which point most owners opt for euthanasia for their dog. The mutation was discovered in Boxers and Pembroke Welsh Corgis, and has now been shown to be present in over 50 breeds. Not all of these breeds have reported clinical symptoms in older dogs, but we have confirmed the disease using our most stringent criteria in 8 breeds now. To confirm DM and add a breed to our "recommended for testing" list, we first confirm 1) clinical symptoms, 2) DNA test result of AFFECTED/AT RISK, and 3) microscopic changes in the spinal cord typical of DM; and we confirm all 3 conditions in the same individual dog. These conditions have not yet been met for American Water Spaniels, as we have not yet had the opportunity to examine a spinal cord section from a symptomatic dog. If any AWS owner has a dog they suspect has DM, please contact the researchers for sample submission instructions (see below). When we can confirm microscopic changes typical of DM in a spinal cord, AWS will be added to our "recommended for testing" list.

The DNA test is available through the Orthopedic Foundation for Animals (OFA), and can be ordered online using their new Online Store. Any dog can be tested, but we list only those breeds where we have confirmed DM by the criteria listed above as "recommended for testing". The DNA test clearly shows dogs who do not have the mutation (normal), dogs who have one normal copy of the gene and one mutated copy of the gene (carrier), and those dogs with 2 mutated copies of the gene (affected/at risk). It is important to understand that not all dogs testing "at risk" will develop clinical symptoms of DM within their lifetime. Additional research is underway to develop a method for determining more precisely which dogs with the "at risk" genetic profile will remain symptom-free and which dogs will develop clinical disease. However, breeders can use the DNA test as they plan litters to reduce the chances of producing puppies who will be at risk for DM in the future.

As of 1-15-09, we have DNA-tested 49 AWS's for the DM mutation. The dogs tested were chosen at random from AWS samples in the U of MO collection for any reason (DNA bank, epilepsy research, or other research projects). Of these 49 dogs, 15 tested NORMAL, 23 tested CARRIER, and 11 tested AFFECTED/AT RISK. Obviously this is only a small snapshot of AWS's, and to get a true indication of breed-wide risk, more dogs will need to be tested. Through communication with AWS owners, we have reports of typical DM symptoms in older AWS's, but no samples from symptomatic dogs have been sent for testing as yet. It will be very important to confirm DM by examining a spinal cord, so again, we ask that AWS fanciers are aware of this condition and bring suspect affected dogs to the attention of the researchers by submitting samples and information. Breeders who believe they have seen this condition in their dogs in the past, or who are concerned about the potential of DM may want to consider testing their breeding stock for the DM mutation, and include knowledge of the test result in the overall decision-making

process when choosing breeding partners. With careful and wise use of the test, overall risk of DM can be reduced while retaining the essential good qualities of the breed.

For additional information on the disease, discovery, research, and recommendations, please see the information on our website – go to www.CanineGeneticDiseases.net, in the DEGENERATIVE MYELOPATHY section. As outlined in the RESEARCH and SAMPLE SUBMISSION portions of the website, any dog that is symptomatic for DM will be tested at no charge. For general screening of any dog, including breeding stock and other young, healthy dogs, testing kits can be ordered through OFA – go to www.OFFA.org, scroll down below the cardiac testing announcement and follow the DNA TESTING links to order the kit.

If there are additional questions not answered by the website, please contact me. We hope that this news will be shared with the AWS community, and that development of this test will be seen as an opportunity toward improved overall health for the breed.

Thank you,
Liz

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