

DM (Degenerative Myelopathy)

At Our Appalachian Doodles the genetic health of our family dogs, breeding dogs and puppies is a primary concern and responsibility. Genetic testing is always completed before any parent dog is used for breeding to ensure that we do not produce further generations of dogs that are affected with mutated genes. Although we strive to have parent dogs with clear genetics, sometimes a dog's other traits are highly desirable and in those cases we will breed the DM Carrier only to a Clear mate to ensure that no puppy we produce will be Affected or At Risk for DM.

What is DM?

DM is an abbreviation for Degenerative Myelopathy. This is a disease of the spinal cord found in many breeds of dog for many many years. The structure of the nerves in the spine gradually breaks down and basically the dog's brain does not know where the dogs back legs are or what position they are in so slowly becomes unable to tell the dogs legs what to do next to be able to walk. This typically starts by the dog 'going over' on his rear feet, dragging the front of the claws on the ground for example, and develops over a few months to be an obvious lack of coordination at the rear and eventually complete loss of the ability to walk and stand at the rear. Sadly this paralysis caused by lack of feedback will spread forwards and gradually affect more and more of the dog's functionality. As well as the practical aspects of life, management of a dog with DM involves an ongoing consideration of the quality of life of the dog as the dog slowly loses more and more capability. Eventually a DM affected dog would starve or suffocate to death as it will be unable to swallow or breathe. Clearly responsible owners will not let things get anywhere near this stage although the exact 'decision point' may be a little different for each of us and our dog.

An important point is that DM itself is painless for the affected animal. The disease is about loss of nerve function so there is a simple loss of sensation to the rear quarters which causes the initial problems. However, there may be secondary issues causing pain, such as falling over or bashing into things causing injuries or straining muscles and ligaments in other areas compensating for the loss of function in the DM affected area. Generally speaking, the affected dogs, in the earlier stages at least, do not seem to exhibit pain due to DM but as the disease progresses this may become part of the judgment call for owners to make for individual dogs.

Dealing With DM

There is no cure or treatment for DM, it is a progressive degenerative disease which will only get worse and lead to the death of your dog. There is no pleasant way to report this so it is only fair to report the truth. Having said that many owners find ways to make life as bearable as possible for as long as possible for their dogs. Some use small two wheel devices, simply referred to usually as carts, to support the rear end and these can have a fantastic effect for a short while enabling the dog to take part in walks and other activities. All too soon though the dog will move on past the stage when these are helpful and again this time frame will vary from dog to dog. Some will consider this is only delaying the inevitable, it should be remembered that there is no primary pain with DM so the dog may well feel that they are having a decent quality of life for a while longer.

There are other issues to consider in coping with a dog with DM such as hygiene and infection avoidance and again these are comprehensively covered in the Berner U sheets available below which, especially if you are reading this because your dog has been diagnosed with DM, I would urge you to print off and read. Bear in mind some of the references given are American and not applicable to the UK but the overall advice is essential reading for anyone encountering or interested in DM.

Genetically Speaking

There is a genetic mutation involved in the incidence of DM that has been found in all affected breeds. As it is present in all dogs and is the only one identified in most cases it is sometimes just known as the DM mutation but for Bernese it is referred to as SOD1A or sometimes Exon2. In Bernese, and only Bernese so far, there is also a second mutation at the same location, logically referred to as SOD1B or Exon1. There are other breeds with separate mutations linked to DM occurrence so we are not unique in this.

Fortunately there are genetic tests available for both of these mutations so breeders should not be taking a step into the dark. To be strictly correct the only 100% validated diagnosis of clinical DM is by means of cross sectional microscopic examination of the spinal cord but this can obviously only be done after death. Practically speaking, the best diagnosis of a symptomatic dog is partly by assessing the symptoms and using the DNA test to give strong supportive evidence. Many conditions will cause similar symptoms so it is about accumulating as much information as you can.

Just to be clear, these are separate tests which means two tests per dog. In line with many other DNA situations each test gives three possible results, Clear, Carrier or Affected. The mode of inheritance of these mutations in breeding combinations is the straightforward autosomal recessive type known to all responsible breeders namely.

- Clear to Clear can only result in clear puppies and no chance of developing the disease or any of the puppies helping to pass it on in the future. This would obviously be the ideal world option but would immediately take out around 60% of the gene pool which we can ill afford to do. We have to operate in the real world so in reality we have to work with other options as shown below.
- **** Clear to Carrier will result (on average) in an even mix of carriers and clears but crucially NO affected or at risk dogs. Meaning the dog will not develop DM.**
- Carrier to Carrier will result (on average) in 25% clear, 50% carrier but crucially 25% affected or at risk puppies.
- Carrier to Affected will result (on average) in 50% carriers and 50% affected or at risk puppies.
- Affected to Affected will result in 100% of affected/at risk puppies.
- Affected to Clear will result in 100% of genetic carriers but crucially no affected or at risk dogs.