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Degenerative myelopathy (DM) is a slowly progressive spinal cord disorder that resembles Amyotrophic Lateral Sclerosis (ALS or Lou Gehrig's Disease) in people. The inevitable result for dogs with DM is paraplegia—hind end [paralysis](#).

Dogs at risk of degenerative myelopathy

DM affects primarily older dogs, with symptoms typically beginning at eight years of age or older. Back in the day (when I was just a pup) we referred to this disease as [German Shepherd](#) Myelopathy because we thought it was unique to this [breed](#). We now know that DM occurs in many purebred and mixed breed dogs. The breeds most commonly affected include the German Shepherd, [Pembroke Welsh Corgi](#), [Cardigan Welsh Corgi](#), [Boxer](#), [Borzoi](#), [Rhodesian Ridgeback](#), [American Eskimo Dog](#), [Bernese Mountain Dog](#), [Golden Retriever](#), [Great Pyrenees](#), [Kerry Blue Terrier](#), [Poodle](#), [Pug](#), [Shetland Sheepdog](#), [Soft Coated Wheaten Terrier](#), [Wire Fox Terrier](#), and [Chesapeake Bay Retriever](#).

Symptoms of degenerative myelopathy

DM symptoms progress slowly over the course of months to even years. From beginning to end, DM affected dogs typically remain alert and animated. The symptoms typically progress as follows:

Initial

- Loss of coordination (ataxia) in the hind legs
- Dragging the hind feet causing wearing down of the toenails.
- Hind end weakness (difficulty climbing stairs, jumping up into the car, going for walks)

Intermediate

- Knuckling of hind feet (weight bearing on the tops of the feet rather than their undersides)
- Difficulty supporting weight with hind legs
- Inability to walk without support

- Urinary and/or fecal incontinence

Advanced

- Paraplegia (paralysis of hind legs).
- Weakness in front legs.

Although this degenerative process is not painful, affected dogs can develop discomfort because of overuse of other body parts attempting to compensate for the hind end weakness.

Cause of degenerative myelopathy

DM causes degenerative changes within spinal cord axons, structures that transmit information back and forth between the brain and the rest of the body. These degenerative changes begin in the thoracolumbar region of the spinal cord, the portion that lines up with the end of the rib cage. This explains why the hind limbs are more severely affected. Given enough time, the disease progresses toward the head end of the body, causing loss of front leg function as well.

DM is an inherited disease. [In 2008 a group of researchers reported through Texas A&M University](#) that a genetic mutation on the SOD1 gene is a major risk factor for the development of DM. Their study involved Boxers, Pembroke Welsh Corgis, German Shepherds, Chesapeake Bay Retrievers, and Rhodesian Ridgebacks.

The researchers discovered that DM has a recessive mode of inheritance. In order for a dog to be affected, the mutation must be inherited from both dam and sire. What remains unknown is why some dogs who have this "double mutation" never develop symptoms of DM.

Genetic testing for degenerative myelopathy

Testing is available to determine an individual dog's SOD1 mutation status. This test is available through the [Orthopedic Foundation for Animals \(OFA\)](#). All that is required is a blood sample or cheek swab.

This DNA test identifies dogs that are normal (have two normal copies of the gene), those who are carriers (have one normal copy of the gene and one mutated copy), and those who are at risk for development of DM (have two mutated copies of the gene). It is important to remember that DNA testing does not diagnose DM.

This is because not all dogs with two mutated copies of the gene go on to develop DM.

Responsible breeders utilize DNA testing for DM to help assess whether or not a particular dog is suitable for breeding purposes. If contemplating purchasing a pup of an at-risk breed, it is important to request DM test results for the dam and sire of the litter of interest. It is also reasonable to have the puppy tested prior to purchase, although, if the parents have been tested and have "normal" results, this is unnecessary.

Making the diagnosis of degenerative myelopathy

DM is a "rule out diagnosis". What this means is that a presumptive diagnosis of DM can only be made by ruling out other causes of spinal cord disease (e.g., herniated intervertebral disk, tumor, infection, trauma). The only way to definitively diagnose DM is via a spinal cord biopsy collected through an autopsy (post-mortem) examination.

The diagnostics performed to rule out other causes of spinal cord disease often include:

- A thorough physical/neurological examination
- Blood and urine testing
- Advanced imaging (CT or MRI scan)
- Spinal fluid collection and analysis

The cause of spinal cord disease is best diagnosed by a veterinarian who specializes in neurology, internal medicine, or surgery.

Treatment of degenerative myelopathy

Currently there is no known treatment capable of significantly altering the course of DM. When searching the Internet, one might find a number of approaches that have been tried or are recommended. Unfortunately, there is no scientific evidence that supports their efficacy.

Prognosis of degenerative myelopathy

Unfortunately, the prognosis for dogs with DM is poor. The quality of life for affected dogs can be enhanced through diligent nursing care, prevention of pressure

sores, rehabilitation therapies such as [swimming](#) and stretching exercises, massage, acupuncture, monitoring for [urinary tract infections](#) (immobilized dogs are more prone), and the use of specialized equipment such as booties, slings, harnesses, and wheelchairs to assist with mobility.

DM becomes so debilitating that most people eventually opt for euthanasia. [Exactly when to euthanize is a highly individualized decision](#) based on how adaptive, both physically and psychologically, the involved dog and human(s) are. Some dogs thrive in a well-fitted doggie cart/wheelchair. Others are highly resistant to such an apparatus. For the human caretaker, in addition to the emotional toll that DM takes, there is a great deal of lifting, carrying, and cleaning involved. Everyone responds differently to this challenging situation.

Letting go of a beloved four-legged family member is never easy, but it can be particularly heartbreaking when DM is the cause. Affected dogs typically have good appetites, are pain-free, and their minds remain just as sharp as ever. Letting go of a dog who acts or feels sick is usually a bit easier, simply because the process seems to make more sense.

Degenerative myelopathy and Amyotrophic Lateral Sclerosis

It so happens that, like dogs with DM, some people with ALS carry the SOD1 gene mutation*1. Having a canine model for studying ALS has important ramifications. Not only might more be learned about the degenerative process that afflicts people with ALS, the canine model may ultimately prove to be valuable in terms of learning more about therapeutic interventions.

Questions for your veterinarian:

- Have other causes of spinal cord disease been ruled out?
- Where could I access rehabilitation therapy for my dog?
- Where would I find a veterinarian who specializes in neurology?
- What symptoms should I be watching for?

If you have any questions or concerns, you should always visit or call your veterinarian -- they are your best resource to ensure the health and well-being of your pets.

Resources:

1. ["Genetics of ALS." - The ALS Association. ALS Association, n.d. Web. 07 Jan. 2015. <http://www.alsa.org/research/about-als-research/genetics-of-als.html>.](http://www.alsa.org/research/about-als-research/genetics-of-als.html)