

# Ongoing Research for Degenerative Myelopathy

## Protocol for Submission of Information, Tissue & Blood Samples

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We would like to thank you for participating in this research project. Your involvement with this study is very much appreciated by the project investigators and participating breed clubs. Our ultimate goal for this project is reduce the prevalence of degenerative myelopathy (DM) in dogs and to gain further understanding of the disease cause and progression.

Research is underway to determine the relative risk for having the mutation and subsequently developing clinical signs of DM, to further evaluate for other genetic or environmental modifying factors influencing the onset & progression of clinical signs, and to further document the pathology in the nervous system. Ultimately, these studies hope to establish measures of disease that can be used to evaluate potential therapies.

Below is a protocol for submission of information and historical information along with instructions for tissue collection. **Please note that we are targeting some cases for a more in-depth workup – please contact us to determine if your case meets the targeted criteria, and a special collection kit should be sent.** The checklist that follows details all the forms of information that we are ideally interested in. However, we understand that not all of these evaluations will be available for every case. We are interested in all the information you can gather and share with us.

## CHECK LIST

(Please include all information that is available; it is not essential that we obtain all of the diagnostic information)

**General Information: (page 3)** – please complete for ALL cases & send with all other information – this one IS essential!

**Questions for pet owner: (page 4)**

**History: (page 5)**

**Physical Examination: (page 6)**

**Neurologic Examination: (page 7-9)**

**Laboratory Results: (if available)**

- ❑ **Complete blood count** – attach results
- ❑ **Serum biochemistry panel** – attach results
- ❑ **Urinalysis** – attach results

**Radiology Studies: (if available)**

- ❑ **Thoracic Radiographs** – attach results
- ❑ **Myelogram / CT / MRI (if available)** – attach results

**Blood Samples for Genetic Research (follow these instructions if you are sending blood samples only):**

- ❑ Obtain pedigree of DM affected dog (if available)
- ❑ Instructions and form for blood sample collection available on website – [www.CanineGeneticDiseases.net](http://www.CanineGeneticDiseases.net) in the “Sample Submission” section for DM
- ❑ Collect 5.0 to 10 ml of whole blood in EDTA tubes from DM affected dog and ship sample as soon as possible to the address on downloaded form.
- ❑ Please email ([HansenL@missouri.edu](mailto:HansenL@missouri.edu)) or call (573-884-3712) Liz Hansen if you have questions.

**Tissue Samples for Diagnosis (follow these instructions if your dog is being euthanized and you are sending tissue samples):**

- ❑ Please contact Joan Coates ([CoatesJ@missouri.edu](mailto:CoatesJ@missouri.edu) or 573-882-7821), or Liz Hansen ([HansenL@missouri.edu](mailto:HansenL@missouri.edu), or 573-884-3712) when euthanasia is being planned. Most cases can follow a general protocol provided in this document (page 10-11). **For some cases that fit specific research targets, a kit may be sent to the veterinarian or owner prior to euthanasia. Please contact us a week or more in advance of planned euthanasia to inquire if your case meets the criteria for a kit.**
- ❑ Complete the forms below as completely as possible and send along with the tissues.
- ❑ Please email: [CoatesJ@missouri.edu](mailto:CoatesJ@missouri.edu) and cc [KatzM@health.missouri.edu](mailto:KatzM@health.missouri.edu) prior to shipping

## UMC CANINE DM RESEARCH – General Information

Registered Name _____	Breed: _____
Reg# _____ Birth Date _____	Call name _____
Microchip or Tattoo: _____	Male / Female - - Intact / Neutered
	Color _____
Owner: name _____	Veterinarian _____
address _____	address _____
city-st-zip _____	city-st-zip _____
phone (day) _____	phone _____
phone (eve) _____	_____
cell _____	Fax _____
<b>EMAIL</b> _____	<b>EMAIL</b> _____

Has this dog been previously DNA tested for DM?      Yes    No

If yes, please provide AMGL case number, or OFA barcode # \_\_\_\_\_

***I submit these samples for the purpose of study of DM; I understand that the tissues will be stored for future research at the University of Missouri or shared with other researchers who are investigating DM or ALS; I understand that accuracy of results are dependent upon quality of tissue samples; I understand that the results of the histopathology will be reported only to the owner listed on this form and to the veterinarian (if requested) listed here.***

**Signed:** \_\_\_\_\_ **date** \_\_\_\_\_

**IMPORTANT!! PLEASE COMPLETE THE QUESTIONNAIRE ON THE NEXT PAGE !!**

**Record Date/Time of Euthanasia:** \_\_\_\_\_

**Record Date/Time Necropsy Completed:** \_\_\_\_\_

Please circle your answer to the questions below, and fill in blanks as appropriate.

Has this dog been diagnosed with Degenerative Myelopathy?  Y  N

Was Degenerative Myelopathy in this dog diagnosed by a veterinarian?  Y  N

What was the date (month and year) that this dog began showing signs of DM? \_\_\_\_\_

Is this dog still alive?  Y  N If NO, when did this dog die \_\_\_\_\_

What was the cause of death? \_\_\_\_\_

How long has this dog been showing signs of DM? (Please Circle)

1-3 mos;  4-8 mos;  9-12 mos;  13-18 mos;  19 mos-24 mos;  25 mos-36 mos;  >36 mos

Which of the following tests were done to make the diagnosis of DM?

No diagnostic tests, clinical symptoms only	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N		
Spinal radiographs (X-rays)	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N	..... result was:	<input type="checkbox"/> normal <input type="checkbox"/> abnormal
Myelogram (contrast X-rays)	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N	..... result was:	<input type="checkbox"/> normal <input type="checkbox"/> abnormal
CT (CAT) scan	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N	..... result was:	<input type="checkbox"/> normal <input type="checkbox"/> abnormal
MRI	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N	..... result was:	<input type="checkbox"/> normal <input type="checkbox"/> abnormal

For any abnormal result, please list findings: \_\_\_\_\_

Describe the **FIRST** symptoms of DM in this dog:

One rear leg weaker than other	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N
Dragging toes	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N
Falling in rear legs	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N
Tremors in rear legs	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N
Pain in back	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N

Describe the **CURRENT** symptoms of DM in this dog (if deceased, symptoms at time of death):

Weakness in one rear leg	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N	Loss of muscle mass in rear legs	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N
Weakness in both rear legs	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N	Loss of muscle mass over entire body	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N
Unable to support weight in rear legs	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N	Urinary incontinence	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N
Unable to move rear legs	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N	Fecal incontinence	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N
Weakness in front legs	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N	Difficulty swallowing	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N
Unable to support weight in all limbs	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N	Pain in back	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N
Unable to move all limbs	.....	<input type="checkbox"/> Y	<input type="checkbox"/> N				

When did your dog start needing assistance to walk outside: \_\_\_\_\_

When was your dog unable to move the rear legs: \_\_\_\_\_

If the front limbs were affected, when did you start noticing weakness: \_\_\_\_\_

FECAL INCONTINENCE:    yes    no    Date of onset: \_\_\_\_\_

URINARY INCONTINENCE:    yes    no    Date of onset: \_\_\_\_\_

Do you know of relatives of this dog who are diagnosed with Degenerative Myelopathy?  Y  N

If yes, please circle:    sire    dam    sibling    grandparent    other \_\_\_\_\_

## HISTORY

<b>Chief Complaint</b>		
<b>History of Present illness (describe signs, when started and rapidity of disease progression)</b>		
<b>Past History</b>		
	<b>Vaccination</b>	
	<b>Deworming</b>	
	<b>Prior illness</b>	
	<b>Surgery</b>	
	<b>Trauma</b>	
	<b>Toxicity</b>	
<b>Medications (include insecticides)</b>		
<b>Environment (indoor, outdoor)</b>		
	<b>Family History (other related dogs affected)</b>	
<b>Diet</b>		
	<b>Dog food</b>	
	<b>Supplements</b>	

# PHYSICAL EXAMINATION

T \_\_\_\_\_ P \_\_\_\_\_ R \_\_\_\_\_ Wt \_\_\_\_\_ lbs

Outline	NAF	Description of Abnormal Findings
General		
Eyes, Ears, Nose		
Skin		
Musculoskeletal		
Cardiovascular		
Respiratory		
Digestive		
Urinary		
Reproductive		
Lymphatic		
Neurologic		
Other		

NAF = No Abnormal Findings

**NEUROLOGIC EXAMINATION FINDINGS: (At time of Euthanasia)**

**MENTATION:**      Alert              Obtunded      Disoriented  
                         Stupor              Coma

**MUSCLE MASS/TONE:**

                 Increased tone in pelvic limbs              Decreased tone in pelvic limbs  
                 Muscle atrophy in pelvic limbs      Muscle atrophy in all limbs

**TREMORS:**    Yes (Describe location) \_\_\_\_\_              No

**POSTURE:**    Normal              Head Tilt              Falling              Wide base stance

**GAIT:**

Date gait abnormalities first noticed: \_\_\_\_\_

Gait at time of euthanasia: (Circle all that apply)

Normal              Ataxia Pelvic limbs only      Ataxia all limbs  
Paraparesis    Right asymmetric paraparesis      Left asymmetric paraparesis  
Intermittently falls in pelvic limbs    Frequently falls in pelvic limbs  
Unable to support weight but still can move pelvic limbs  
Paraplegia  
Thoracic limb weakness  
Tetraplegia

When did this dog start needing assistance to walk outside: \_\_\_\_\_

When was this dog unable to move the rear legs: \_\_\_\_\_

If the front limbs were affected, when was weakness first noticed: \_\_\_\_\_

**FECAL INCONTINENCE:**              yes      no      Date of onset: \_\_\_\_\_

**URINARY INCONTINENCE:** yes      no      Date of onset: \_\_\_\_\_

**POSTURAL REACTIONS: N=Normal; ↑= Exaggerated; ↓=Decreased; A=Absent**

Left	Reaction	Right
	Proprioception	
	Fore	
	Rear	
	Hopping	
	Fore	
	Rear	
	Extensor Postural Thrust	
	Fore	
	Rear	
	Wheelbarrowing	
	Fore	
	Rear	

**CRANIAL NERVES: N=Normal; ↑= Exaggerated; ↓=Decreased; A=Absent**

Left	Nerve + Function	Right
	II Vision + Menace	
	II/III Pupil Size	
	V/VI/VII Corneal	
	V/VII Palpebral	
	II/III PLR	
	VIII Strabismus	
	Spontaneous Nystagmus (direction)	
	Positional Nystagmus	
	Physiologic Nystagmus	
	V Sensation Face	
	VII Sensation Pinnae	
	V Mastication	
	VII Facial Muscles, Symmetry	
	IX/X Swallowing	
	XII Tongue	

**SPINAL REFLEXES: N=Normal; ↑= Exaggerated; ↓=Decreased; A=Absent**

	Left	Reflex	Right
<b>Myotactic</b>		Triceps	
		Biceps	
		Patellar	
		Gastrocnemius	
		Cranial Tibial	
<b>Flexor</b>		Flexor Fore	
		Flexor Hind	
		Cutaneous Trunci	

**Crossed Extensor Reflex: L fore \_\_\_\_\_ R fore \_\_\_\_\_ L hind \_\_\_\_\_ R hind \_\_\_\_\_**

PERINEAL REFLEX:           exaggerated           normal           decreased   absent

TAIL TONE:           normal           decreased   absent

**PAIN ON SPINAL MUSCLE PALPATION:**

Cervical:    yes   no           Thoracic:   yes   no

Lumbar:     yes   no           Sacral:           yes   no

**SENSATION: N=Normal; ↑= Exaggerated; ↓=Decreased; A=Absent**

Superficial Pain		Deep Pain
	L fore	
	R fore	
	L hind	
	R hind	