Ongoing Research for Degenerative Myelopathy
Protocol for Submission of Spinal Cord Samples

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Participating Breed Clubs: American Boxer Club, Pembroke Welsh Corgi Club of America, Rhodesian Ridgeback Club of the United States, French Bulldog Rescue League, French Bulldog Club of America

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.

Dogs that have clinical signs or a presumptive diagnosis of DM have tested as genetically affected for this risk factor. A relatively high percentage of dogs in several breeds (including Boxers, Pembroke Welsh Corgis, Chesapeake Bay Retrievers and Rhodesian Ridgebacks) have the predisposing mutation. It is important to note that there are a large number of dogs that have tested as genetically affected, but are reported as clinically normal by their owners. It may be that many of these dogs will develop clinical signs as they get older or that the mutation will never manifest in these dogs. Research is still needed to determine the frequency of the mutation in breeds known to have DM (German Shepherd Dogs, Rhodesian Ridgebacks, Pembroke and Cardigan Welsh Corgis, Boxers, Chesapeake Bay Retrievers), to further evaluate for other genetic or environmental modifying factors, and to further document the pathology in the nervous system.

Below is a protocol to follow for submission of spinal cord and nerve specimens.

CHECK LIST

General Information: **(See Form Below)**

Questions for pet owner: **(See Form Below)**

History: **(See Form Below)**

Physical Examination: **(See Form Below)**

Neurologic Examination: **(See Form Below)**

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:

- Obtain pedigree of DM affected dog
- Instructions and form for blood sample collection available on website – 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 related dogs (siblings and parents) and ship sample as soon as possible to the address on downloaded form.
- Please email (HansenL@missouri.edu) or call (573-884-3712) Liz Hansen if you have questions.

Spinal Cord / Nerve Sample for Diagnosis:

- Remove section of spinal cord from **T10 to L2 with nerve rootlets (to level of intervertebral foramen);** place in 10% buffered formalin
- Remove section of sciatic nerve near stifle region and place in 10% buffered formalin
- Remove a piece of biceps femoris and gastrocnemius mm.; place a piece of each in a red top tube and freeze and place a piece in 10% buffered formalin
- Record time of euthanasia _____
- Record time of spinal cord removal _____
- Send tissues on ice packs over-night to Dr. Joan R. Coates, Department of Veterinary Medicine and Surgery, 379 E. Campus Drive, Clydesdale Hall, University of Missouri, Columbia, MO 65211
- Please email: CoatesJ@missouri.edu or call (573-882-7821) prior to shipping

GENERAL INFORMATION

Date of Sample Submission: _____

Owner's Name: _____

Address: _____

_____

_____

_____

Phone:

Home: _____

Work: _____

Email: _____

Dog's Name: _____

D.O.B. _____ **Age**_____

Sex ❒ **Female** ❒ **Male** ❒ **Neutered**

Breed: _____

Colors: _____

Referring DVM:

Name: _____

Address: _____

_____

_____

Phone: _____ **Email:** _____

QUESTIONS FOR THE PET OWNER:
(PLEASE CIRCLE ALL THAT APPLY)

Has your dog been diagnosed with Degenerative Myelopathy? Y N

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

How long has your dog been showing signs of DM?

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?

Were diagnostic tests were performed	Y N
Spinal radiographs (X-rays)	Y N
Myelogram (contrast X-rays)	Y N
CT (CAT) scan	Y N
MRI	Y N

Describe the **first** symptoms of DM in your dog:

One rear leg weaker than other	Y N
Dragging toes	Y N
Falling in rear legs	Y N
Tremors in rear legs	Y N
Pain in back	Y N

Describe the symptoms of DM in your dog **now**:

Weakness in one rear leg	Y N
Weakness in both rear legs	Y N
Unable to support weight in rear legs	Y N
Unable to move rear legs	Y N
Loss of muscle mass in rear legs	Y N

Urinary incontinence	Y N
Fecal incontinence	Y N
Weakness in front legs	Y N
Unable to support weight in all limbs	Y N
Unable to move all limbs	Y N
Loss of muscle mass over entire body	Y N
Difficulty swallowing	Y N
Pain in back	Y N

Do you know of relatives of your dog diagnosed with Degenerative Myelopathy? Y N

If yes, please circle: sire dam sibling grandparent

Other relatives _____

HISTORY

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

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 (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

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
Myotactic		Triceps	
		Biceps	
		Patellar	
		Gastrocnemius	
		Cranial Tibial	
Flexor		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	