

Canine Degenerative Myelopathy and Genetic Testing in Pembroke Welsh Corgis

By Jerold S. Bell DVM

Degenerative myelopathy (DM) is a specific genetic disease causing spinal cord degeneration in older dogs. It has a complex mode of inheritance with the effect of more than one gene pair having to combine to cause a clinically affected dog. Affected dogs begin to show signs of the disorder usually between 8 and 14 years of age. The average age of onset in Pembroke Welsh Corgis is 11 years of age. Sporadic cases of clinically affected dogs have been pathologically confirmed in 34 purebreds and in mixed breed dogs, but the majority of clinical cases occur in only a handful of breeds, including the Pembroke Welsh Corgi.

The clinical signs of DM begin with weakness of the hind legs, scuffing of the hind toes, crossing of the hind legs, and progressing to dragging of the hind legs. The progression is slow, occurring over six months to two years. With excellent nursing care (and a canine wheelchair), affected dogs can progress to advanced disease: losing urine and bowel control, showing weakness or paralysis of the forelimbs, and eventually loss of control of breathing. All affected dogs are eventually euthanized – most prior to these later stages. DM is not a painful disease but one of loss of motor (muscular) and sensory (feeling) function. There is no treatment that alters the clinical progression of DM. As several different disorders can mimic the clinical signs of DM, a confirmed diagnosis can only be made through a pathological examination of the spinal cord.

In the only controlled study of breed frequencies of clinical degenerative myelopathy (UC-Davis study of the Veterinary Medical Database Program 1990-1999) 0.6% of Pembroke Welsh Corgis were diagnosed with DM. That refers to about 1 out of 167 Pembroke Welsh Corgis that will become affected with the disorder. It is possible that a higher percentage of PWCs become affected, but would not be a significantly higher percentage.

In 2008, researchers at the University of Missouri identified a recessive mutation in the *sod1* gene that is homozygous “at risk” (carrying two copies) in all pathologically confirmed DM affected Pembroke Welsh Corgis (and clinically affected dogs of other breeds). Dogs that do not have two mutated copies of the *sod1* gene will not develop DM. A genetic test for the *sod1* mutation is available from several dog DNA testing laboratories including the University of Missouri (OFA testing).

As DM is a complexly inherited disease, clinically affected dogs must have a mutation in another (yet unidentified) gene or

genes in addition to being homozygous for the *sod1* mutation. Otherwise they will never develop clinical DM.

The *sod1* mutation is an ancient mutation in the dog genome and is the most frequent mutation identified in the genetic screening of mixed-breed and purebred dogs. Mars/Genoscooper testing finds that the *sod1* mutation frequency is 7.77% in all mixed-breed dogs tested, and 5.41% in all purebred dogs tested. In several breeds the frequency of the *sod1* mutation is

over 90%, but no members of the breed have ever been pathologically confirmed with clinical DM.

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(AKC DELEGATE'S MESSAGE . . . continued from p. 8)

members of our sport have used service dog vests to get show dogs onto airplanes. All of this must stop so that a handicapped person with a well-trained service dog will get improved access to airplanes and other venues.

AKC FORUM: This is a presentation that always precedes the AKC Delegates' Meeting. In June, Doug Ljungren, AKC Executive Vice President, Sports & Events, gave a talk on “The State of the Sport” in which he reported that new 1 + 1 = 1 change in the AKC Rules where BW can earn one point even if there is only 1 class dog of each sex entered has been a BIG success so far and has resulted in an average of 4 more entries per breed per show and a 50% cut in the absentee rate! He also talked about the many new ways AKC is trying to increase participation in our Sport including new events like Freestyle Obedience, “Fetch It”, Fit Dog Club, Introduction Videos which tell new folks about the Sport, Email campaigns to attract new spectators to all AKC events, and “Build A Trainer” finder to help folks find trainers and training clubs in their area. AKC is looking ahead to the future and trying to provide enjoyable canine activities for dogs and their owners of all ages!

I will be attending the Delegates Meetings in Newark, NJ on September 9 & 10, 2019. If you have any questions about AKC, need help dealing with an AKC issue or would like to have a topic addressed in this column, please contact me! I am here to serve you!

~ Anne H. Bowes, AKC Delegate; heronsway.corgis@verizon.net

Spotlight on MAYFLOWER PWCC

Dr. Michaelann Cox Mako • michaelanncox@optonline.net

THREE CHEERS for the completion of an outstanding 29th Independent Specialty show co-chaired by Judy Pilat and Dolores Bechard! From June 9th – 14th, Mayflower's Specialty events included morning and afternoon Pembroke, Cardigan, and Vallhund herding trials on Sunday; an all-breed herding instinct test and all-breed agility trials on Monday; corgi-only morning and afternoon agility trials on Tuesday; Rally Obedience and Altered Classes on Wednesday; Puppy Sweepstakes, Veteran Sweepstakes, and Obedience on Thursday; and Regular Classes and Obedience on Friday. While you can read all our AKC official results in this issue of the *Newsletter*, our club's special events and special awards are worthy of report.

The club honored one of its most iconic members, **DEBORAH HARPER**, by voting her into *Honorary Membership*. By 1977, when Debbie and Mayflower's other charter members saw a need to start a new regional club, she had already been in the breed for 17 years, bringing with her considerable experience and expertise. Debbie has functioned in multiple capacities in our club. Serving on the board of directors with proficiency in rules and procedures, she has played a parliamentary role in the establishment of the club's constitution and bylaws. She's judged matches and sweepstakes, offered educational seminars, acted as the advertising editor, and later also as the production editor of *The Corgi Cryer* from Summer 1990 to its very last issue in the Winter of 2015. She wrote multiple articles for *The Corgi Cryer* on breeding, whelping, raising, grooming, playing with and keeping your corgi healthy, among many other topics.

In the 1970s, Mary Gay Sargent set out to write a book about the Pembroke Welsh Corgi. She began the groundwork and had outlined much of the material when Debbie was invited to collaborate on the book. In August 1979, *The Complete Pembroke Welsh Corgi* was published by Howell Book House, which remains the textbook on the breed. Fifteen years later, after substantial additions and revisions, *The New Complete Pembroke Welsh Corgi* was published in October 1994 with Debbie as its sole author. The book contains the best and most detailed history, development, standard, and care of the breed for a book of its kind. Debbie has published other articles and books, including *The Pembroke Welsh Corgi: An Owner's Guide to a Happy Healthy Pet* (Howell Book House, 1998, and 2009 with DVD), and contributed the Pembroke Welsh Corgi profile to the *The New Complete Dog Book: Official Breed Standards and All-New Profiles for 200 Breeds, 21st edition*, Lumina Media, November 11, 2014.



Deborah Harper. Photo: Mary Elizabeth Simpson

Serving on the Illustrated Standard Revision Committee of the PWCCA, Debbie participated in the development of *The New Illustrated Study of the Pembroke Welsh Corgi Standard*, a process that took a five-member committee seven years to complete. *The New Illustrated Study* was published by the PWCCA in 2000 and revised in 2006. It is no surprise that Debbie is ardent about and an authority on the breed standard.

A true scholar (and not just about dogs – oh, but she has also bred and knows all about Swedish Vallhunds), Debbie is someone who is ready and willing to communicate her knowledge and experience. She remains solidly there to educate,

encourage, and lend a helping hand, all within a context of trust – because how we do trust this woman! The Pembroke Welsh Corgi has been the beneficiary of Debbie's 57 years of experience. Her contribution to the breed is nothing short of extraordinary. And while Debbie Harper is internationally known, she is Mayflower's own, and we can call upon her anytime. At the Specialty Banquet, many friends came together to bid on three Royal Doulton Spring



Vintage photo of Debbie Harper talking to Tasha Tudor and Mary Gay Sargent, 1981 Woodstock, CT. Photo: Cy Harvey

(DM IN PEMBROKES . . . continued from p. 53)

In PWCs, 52.7% of the breed tests homozygous “at risk” for the *sod1* mutation, 35.1% test as heterozygous carriers, and 12.2% test homozygous normal. This means that on average only 1.1% of Pembroke Welsh Corgis testing homozygous “at risk” for the *sod1* mutation will become clinically affected with DM. This percentage would be much higher in families with pathologically confirmed closely related affected dogs. By itself, the results of *sod1* testing are a poor predictor of clinical disease.

Due to the high frequency of the *sod1* mutation but the low frequency of clinical disease in the breed, it is recommended the Pembroke Welsh Corgi breeders not use the results of the *sod1* mutation in making breeding decisions unless there are confirmed DM affected close relatives (and therefore a high risk of carrying the other required mutation(s) for clinical disease).

87.8% of Pembroke Welsh Corgis test either as heterozygous carrier or homozygous “at risk” for the *sod1* mutation. If breeders attempt to eliminate the *sod1* mutation or only breed to the 12.2% of dogs not carrying the mutation, this will cause a severe and possibly disastrous restriction of the breed gene pool and breed genetic diversity.

There are several common disease processes in Pembroke Welsh Corgis (including spinal disc disease) that can cause similar clinical signs of DM. A *sod1* test result can rule out a clinical diagnosis of DM, but cannot confirm a clinical case of DM.

While owners may be comforted in purchasing a PWC that is not homozygous for the *sod1* mutation, this encompasses less than half the members of the breed. 98.9% of Pembroke Welsh Corgis testing homozygous “at risk” will never develop the disease.

More important to breeders is the knowledge of close relatives that have been pathologically confirmed with clinical DM. This gives the best indication that the dog is at high risk of carrying the other unidentified genes required for clinical disease – where *sod1* testing is indicated. The best action the breed can take would be to maintain an open pedigree database of pathologically confirmed dogs with DM. Again, focusing on *sod1* testing of all Pembroke Welsh Corgis will just create enormous pressure to restrict the breeding of healthy, quality dogs and severely restrict the genetic diversity of the breed.

[This article is reprinted with permission of the author and at the request of the PWCCA Board of Directors.]

Dr Jerold S. Bell is an adjunct Professor of clinical genetics at the Cummings School of Veterinary Medicine, Tufts University. He prepared this explanation of Canine Degenerative Myelopathy in the Pembroke Welsh Corgi to help breeders/owners of Pembrokes better understand the clinical and genetic complexities of this much misunderstood condition. He may be contacted via email at jerold.bell@tufts.edu.

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April 21-23, 2021	Pembroke Welsh Corgi Club of the Potomac	Eisenhower Hotel & Conference Center Gettysburg, PA	Karen Fruhmenn (BRUMBAER) – Sweepstakes, Altered John Burgess (BRECONMOHR) – Breed Elizabeth (Tibby) Chase – Obedience/Rally	TBA
May 21-22, 2021	Golden Gate Pembroke Welsh Corgi Fanciers	Los Gatos Lodge Los Gatos, CA	Karen Werfield (FAIRYKIST) – Sweepstakes Annette Anagnostis (ANBENLY) – Breed Obedience/Rally – TBA	TBA
June 4, 2021	Gaitway Pembroke Welsh Corgi Club	Purina Farms Gray Summit, MO	TBA – Sweepstakes Tim Mathiesen (NEBRIOWA) – Breed	TBA
June 7-11, 2021	Mayflower Pembroke Welsh Corgi Club	TBA	Robert Simpson (VANGARD) – Sweepstakes Gayle Garvin (GARVIN) – Breed David Mauer – Rally Betsy Horn-Humer – Obedience	Holly Bunn Russo, Corresp Sec'y townhillcorgis@charter.net
August 13, 2021	Cascade Pembroke Welsh Corgi Club	Red Lion Hotel Olympia, WA	Nissa Lindstrom (LINDFOX) – Sweepstakes Kandy Boll (CORCARD) – Breed James Thomson – Obedience/Rally	TBA
September 25 – October 2, 2021	Pembroke Welsh Corgi Club of America National Specialty	Wilson Exposition Center Lebanon, TN	Nancy Oehlhof (SPRINGMILL) – Sweepstakes Vicki Sandage DVM (SANDFOX) – Bitches Danelle Brown (NOMAD) – Dogs and BOB	Gail Marcum & Melissa Ericksen Co-Chairs gmarcum2012@gmail.com PemCorgiME@charter.net Lynda McKee, Performance Coordinator tifflynldm@aol.com
October 28-29, 2021	Lakeshore Pembroke Welsh Corgi Club	TBA	<u>Thursday</u> Jo Durrance (TALISMAN) – Sweepstakes TBA – Breed Dianne Allen – Obedience/Rally <u>Friday</u> Carole Keong (SIDWELL) – Breed Fred Buroff – Obedience/Rally	TBA

To include your club's listing, please e-mail the name of show, date, location and judging panel with show chair or club contact to:
Sharon Cerny at corgis@wi.rr.com

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