

## ***Canine Health Information Center (CHIC) Program for Shetland Sheepdogs***

**April 2008**

Health problems, in general, are not common in Shelties; however, testing of breeding stock is a recommended practice to keep the incidence of certain problems as low as possible. It must be remembered that dogs are animals, not machines, and on average, every dog has 4 to 5 defective genes.<sup>1</sup> Congenital and/or hereditary problems will occur no matter how conscientious a breeder is. Nonetheless, breeders should strive to breed Shelties that are a combination of beautiful breed type and good health.

The Canine Health Information Center (CHIC) [www.caninehealthinfo.org/chicinfo.html](http://www.caninehealthinfo.org/chicinfo.html) is a canine health database program jointly sponsored by the AKC/Canine Health Foundation (AKC/CHF) and the Orthopedic Foundation for Animals (OFA).

Its purpose is to assist breeders in breeding healthy dogs and being a central resource of health information for breeders, owners, and researchers. Over 100 breed clubs participate in the program. The national club for each participating breed recommends health tests to be performed in dogs used for breeding. The number and types of tests are tailored to the needs of each breed. Dogs that have had the required tests will receive a CHIC number, and the CHIC database can be searched for dogs having CHIC numbers. Additional health tests may be recommended, but are considered optional for that breed.

Normalcy is not required for participation in the CHIC program; abnormal results of any test are only released to the public with owner permission. As new tests become available, the list of required and optional tests may be altered. Participation in the CHIC program is voluntary.

Breed requirements for Shetland Sheepdogs are as listed below and on the CHIC Shetland Sheepdog web page. <http://www.caninehealthinfo.org/brdreqs.html?breed=SS>

### Required tests:

Hip dysplasia (OFA or PennHIP)

Eye clearance (Canine Eye Registration Foundation, CERF)

von Willebrand's Disease (VetGen, test results registered with the OFA)

Multiple drug sensitivity (MDR1) DNA test (Washington State University, results registered with the OFA)

### Optional tests:

Autoimmune thyroiditis (OFA evaluation from an approved laboratory, test results registered with the OFA)

Collie eye anomaly DNA test (Optigen, test results registered with the OFA)

Elbow dysplasia (OFA)

Congenital cardiac database (OFA evaluation by board certified cardiologist or internal medicine specialist)

American Temperament Testing Society, TT title, (test results registered with the OFA)

## Brief Explanation of the Tests

### Required tests:

Hip Dysplasia Evaluation – As of March, 2008, Shetland Sheepdogs rank 129th of 150 breeds of dogs evaluated for hip dysplasia by the Orthopedic Foundation for Animals (OFA) [www.offa.org](http://www.offa.org). Of 16,223 Shelties evaluated, 4.8% were dysplastic. OFA certification or PennHIP evaluation of the hips (x-ray examination) is on the required list for the CHIC program because hip dysplasia can be a crippling disorder, and one affected influential dog used in breeding programs could increase the incidence in Shelties. OFA hip evaluation results are automatically included in the OFA database with no extra charge. More information can be obtained by clicking on the following link:

<http://www.offa.org/hipinfo.html>

### Eye Certification with the Canine Eye Registration Foundation (CERF)

<http://www.vmdb.org/cerf.html>

Eye abnormalities can occur at any age. Ophthalmic examination can detect a variety of congenital abnormalities, including Progressive Retinal Atrophy (PRA) and Collie eye anomaly (CEA), which also occurs in Shelties. The merling gene may make it difficult to detect mild cases of CEA by ophthalmic examination because merling is normally associated with less pigmentation of the eyegrounds (back of the eye). Also, the CEA lesions (chorioretinal hypoplasia) in some mildly affected dogs may be partially masked as the eye matures, so may be missed at 8-10 weeks of age or later. Thus examination at an early age, about 5-8 weeks of age, is recommended. Because the onset of other eye diseases (such as cataracts and retinal degeneration) can occur at any age, dogs should be reexamined periodically. A more detailed discussion can be found at: [http://www.vmdb.org/aug02.html#d\\_xspot](http://www.vmdb.org/aug02.html#d_xspot)

Ideally, each dog should be examined within the preceding 12 mos. of being bred. According to the link above, the likelihood of a genetic problem showing up after age 9 years is low. The test is an eye examination performed by a board certified veterinary ophthalmologist. Results are automatically included in the OFA database with no extra charge.

von Willebrand's Disease (vWD) DNA Test – vWD is a potentially serious bleeding disorder and one that can be kept from being a major problem in the breed by having this one-time DNA test done. According to the VetGen website (<http://www.vetgen.com/canine-vwd3.html>), the incidence of vWD in Shelties as of January, 2005 is: Clear – 92%, Carrier - 7%, Affected – 1%. Dogs "Clear By Parentage" (first generation - see OFA website for detailed policy) would be accepted into the CHIC program. The test can be performed using DNA from cheek brush collection that can be mailed-in by the owner.

Multiple Drug Sensitivity (MDR1 gene) DNA Test – This DNA test identifies dogs that are sensitive to several medications. Shelties, Collies, Australian Shepherds, and Border Collies are a few of the breeds with this genetic mutation. Several commonly used drugs, ex. antiparasitic drugs (some used in heartworm preventatives), tranquilizers (acepromazine), and anti-diarrheal drugs (Imodium®) are a few of the drugs that may affect dogs with this genetic mutation. This test would provide useful, practical knowledge for every Sheltie owner, since knowing the status of each dog as clear, carrier, or affected would help a veterinarian determine which drugs to use or avoid in a particular dog. As of March, 2008, 448 Shelties have been tested (Washington State University) with 11% being heterozygous (carriers) for the MDR1 mutation, and 1 % homozygous for the MDR1 mutation. Heterozygous dogs (carriers) exhibit sensitivity to drugs that is similar to or less than that of homozygous (affected) dogs. A complete list of drugs that may affect dogs with the MDR1 gene can be found at the following link:

<http://www.vetmed.wsu.edu/depts-VCPL/drugs.aspx>.

More information on the topic can be found at: <http://www.vetmed.wsu.edu/depts-VCPL/> and

<http://www.ashgi.org/articles/mdr1.htm> . Dogs “Clear By Parentage” (first generation - see OFA website for detailed policy) would be accepted into the CHIC program. The test can be performed using DNA from cheek brush collection that can be mailed-in by the owner.

Optional tests:

Autoimmune Thyroiditis – Autoimmune thyroiditis may lead to hypothyroidism. It is generally accepted that autoimmune thyroiditis is inherited; however, studies to determine mode of inheritance either have not been performed or are inconclusive.

2 According to the OFA website, where breed results for the Michigan State University Laboratory are listed, Shetland Sheepdogs are 24th of 140 breeds (in which 100 or more evaluations have been performed) with autoimmune thyroiditis. Of 14,110 Sheltie evaluations, 12.7% were positive for autoimmune thyroiditis. From the OFA website, “Since the majority of affected dogs will have autoantibodies by 4 years of age, annual testing for the first 4 years is recommended. After that, testing every other year should suffice. Unfortunately, a negative result at any one time will not guarantee that the dog will not develop thyroiditis.” The ASSA Research Advisory Committee recommends that, at a minimum, dogs be tested at 2, 4, and 7 years of age. A blood sample is needed for this test. The Committee debated whether or not this test should be on the required list as it should be repeated multiple times over the life of a dog, and it is more expensive than other procedures that should be repeated such as eye certification. More information on autoimmune thyroiditis can be found at the following links: <http://www.offa.org/thygeninfo.html> and <http://www.upei.ca/~cidd/intro.htm> .

Collie Eye Anomaly (CEA or Choroidal Hypoplasia) DNA Test - CEA is a recessively inherited ocular anomaly that affects development of a portion of the eye. Homozygous recessive dogs may have lesions ranging from mild to severe. Heterozygous dogs will be phenotypically normal. Choroidal hypoplasia, coloboma, and retinal detachment are features of the disease. It occurs in Shetland Sheepdogs as well as other herding breeds. The CEA DNA test can distinguish between normal, carrier, and affected dogs. Unlike CERF examination, it is indifferent to the age of the dog or the presence of the merle gene.

The ASSA Research Advisory Committee encourages breeders to consider this test for their breeding stock to keep the incidence of this problem as low as possible. A blood sample is needed for this test. This test is for CEA only, so CERF examinations must still be performed to rule out other types of hereditary eye disease such as progressive retinal atrophy.

For an excellent discussion on the topic, see the following link  
[www.optigen.com/opt9\\_test\\_cea\\_ch.html](http://www.optigen.com/opt9_test_cea_ch.html)

Frequencies Based on CERF Eye Exams in the U.S. from 1991 to 1999

Choroidal Hypoplasia

Coloboma

Retinal Detachment

Collies

66.7%

8.75%

1.88%

Border Collies

2.12%

0.57%

0.06%

Shelties

0.39%

0.79%

0.05%

CERF numbers may underestimate the prevalence of the CEA mutation, because of the difficulty of detecting the defect in older dogs and the difficulty in diagnosing in a merled dog. Although the incidence of CEA in American Shelties is relatively low, it occurs in European Shetland Sheepdogs in a significantly greater frequency. For this reason, it is recommended that, at the very least, imported Shelties be tested for the CEA gene. Dogs "Clear By Parentage" (first generation - see OFA website for detailed policy) would be accepted into the CHIC program.

As of July, 2008, OptiGen will send the CEA (Collie eye anomaly) DNA test results for Shelties automatically to OFA.

Only normal results will be made public unless an owner notifies OFA that he/she would like abnormal results to be posted.

The normal OFA fee of \$15 to have the results posted will be discounted to \$7.50 and collected by OptiGen. For more information see: <http://www.optigen.com/>

Elbow dysplasia – Of breeds having 100 or more elbow evaluations, Shetland Sheepdogs rank 62nd of 92 breeds with elbow dysplasia. As of March, 2008 there have been 404 Shelties evaluated with 97.3% being normal. More information about elbow dysplasia can be found at the following link: <http://www.offa.org/elbowinfo.html> Radiographs (x-rays) are required for this test.

Congenital Cardiac Database – Many congenital cardiac defects have a genetic component, and nearly all common ones produce audible murmurs that can be detected by a veterinarian using a stethoscope. Although not common in Shelties, such defects have been found in the breed. OFA certification for the cardiac database is primarily based on examination by a veterinarian using a stethoscope. Because some veterinarians are more experienced at detecting subtle murmurs than other veterinarians, the ASSA Research Advisory Committee stipulated that the examination must be performed by a board certified veterinary cardiologist or internal medicine specialist. Dogs must be 12

mos. of age to receive a certification number. As of March, 2008 61 Sheltie evaluations have been entered into the OFA database. More information can be obtained at the following link:

<http://www.offa.org/cardiacinfo.html>

American Temperament Testing Society, TT title - The "TT" title isn't exactly a health test; however, some breeds do include temperament testing in their CHIC test list, and since heredity does play a role in temperament, the ASSA Research Advisory Committee included it on the optional list. Minimum age for a dog to take the test is 18 mos. As of December, 2007, 472 Shelties have been tested. The pass rate was 67.4%. More information on the test can be obtained at the following

<http://www.atts.org/about.html>

1. George A. Padgett, DVM, Michigan State University, Prioritizing Genetic Defects, [www.lgd.org/library/PadgettDefects.htm](http://www.lgd.org/library/PadgettDefects.htm)
2. Canine inherited disorders database - <http://www.upei.ca/~cidd/intro.htm>
3. From the OptiGen website: [http://www.optigen.com/opt9\\_test\\_cea\\_ch.html](http://www.optigen.com/opt9_test_cea_ch.html)

### **CHIC Program - Questions & Answers**

May, 2008

1) For those dogs already meeting the requirements, how long do you think it will take before they show up on the site when one does a search for CHIC Shelties? *Within two weeks.*

2) Will dogs that have had CERF examinations be included if the exams are out of date? *Yes, as long as there is a CERF report on file*

3) Once a dog receives a CHIC number, he/she will remain on the CHIC list even if the CERF exam is out of date. Is that correct? *Yes, both the CHIC report and website will list WHEN the test was done, as well as the cumulative CERF testing history*

4) When submitting the results of the VetGen and MDR-1 tests, one should use the DNA application form ([www.offa.org/dnainfo.html](http://www.offa.org/dnainfo.html)). On that form, there is a space for a previous application number. What is that referring to? Would the application number on the OFA certificate be it? *Application number is the internal OFA assigned number*

5) Is there a Clear by Parentage option available for both the vWD and the MDR-1 gene? *The answer is yes. I believe that point is noted on the CHIC webpage for Shelties and on the ASSA website. Concerning the Clear by Parentage issue, I was unable to find any information on the VetGen website concerning the Clear by Parentage option. It may be there, I just didn't find it. I do know that the option is discussed on the OFA website <http://offa.org/dnacbp.html>. The following is from that page: "For direct mutant gene tests only, the OFA will issue clearances to untested offspring, if the sire and dam have both been DNA tested clear, if the sire and dam's DNA disease test results have been OFA registered, and if all three (sire/dam/offspring) have been DNA identity profiled and parentage verified. The DNA profile paperwork must be submitted along with a completed OFA DNA-based disease test application."*

6) I had assumed that if the parents' results were registered by the OFA that the offspring would automatically be given the CBP clearance if the owner submitted the appropriate form and fee, but after reading the above, I see that there are additional requirements that, I think, will cause many owners to

balk. Why not just accept that AKC registration papers are correct rather than requiring DNA profiles of all 3 individuals? *For the MDR-1 test, it would be cheaper to get the test done on the offspring than to get the CBP done. Please let me know if I am understanding the situation correctly. The OFA Board discussed the CBP policy at the spring 2008 board meeting, and decided the policy should stand. The rationale is that the OFA is going out on a limb and issuing the clearance to an untested dog. In doing so, the board wants absolute confidence that the dog is in fact the offspring of the cleared parents. DNA profiling should not be viewed as a cost of the clearance, but a regular cost of breeding dogs. Responsible breeders should be profiling their dogs regardless for the integrity of the stud book.*

7) Must a dog be permanently identified (tattoo or microchip) in order to have genetic test results posted on the OFA or CHIC website? *On the OFA submission form, there is a place on the form for a veterinarian to certify that the DNA sample was correctly collected and that he/she had verified the permanent identification of the dog tested. If this is not done, you can still submit the test results. The information may be listed as "no permanent identification" as is done for hip reports. If a veterinarian does not sign the OFA DNA form that goes with vWD and MDR-1 test results, there is another form, "Verification of Permanent Identification" <http://offa.org/apps.html> . It is suggested that you download and read that form to understand why it may be required in some instances.*