LIGHTING THE WAY

BeaCon for Health

The Bearded Collie Foundation for Health

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In This Issue

President's Reflections

What does reflection mean? Think on, contemplate, consider, or ponder about something.

How did I use the word previously? In my previous "life" as a neonatologist, I studied outcome of survivors of the Neonatal Intensive Care Nursery and also was fascinated by the fact that newborn infants had a "language". That interest was fostered by T. Berry Brazelton, MD of Boston in 1975 who designed a behavioral observation to describe infant "language". He recognized a newborn infant's capacity to interact with both animate and inanimate surroundings and the innate ability of parents to respond. I studied and became certified in Brazelton's program and later in a program for premature babies called NIDCAP, and as a trainer.

The goal of NICAP is to improve long term outcome for babies in neonatal intensive care. The methodology is to observe the infant's response during care procedures and then to revise how the care is given by considering the infant's stress responses to the care and/or the environment. For example, if a baby has apnea (i.e., stops breathing) due to loud noises in the room, change could be made to mute the noises or move the baby to a quieter room.

NIDCAP is a relationship based care model, meaning that human relationships are involved and the infant and family are considered an integral part. Combining a relationship based care model with an existing medical model requires changes in caregiver practice, the NICU culture, and the hospital system. Reflecting on the process of implementing NIDCAP gives understanding of where change is needed for one infant in his/her nursery in that specific hospital with its staff and culture. It cannot be done by rigid protocols, as is traditional with the medical model. Studies both in North America and Europe have proven that infants outcome is significantly improved by NIDCAP.

Why did I choose Reflections as the title of this column in Lighting The Way?

BeaCon evolved out of interest in establishing a long term health registry and history for Bearded Collies, something that was unworkable at the time within the BCCA. Developing BeaCon's missions was a time for reflection. What could be successful, given that dog owners are so widely dispersed geographically and with such varied backgrounds and at best, loosely organized under the umbrella of parent clubs. How could a relationship be established between individual dog owners and breeders with an organization focused solely on health? Could such an effort even hope to succeed? Why did people resist having health information be public?

I haven't all the answers but have learned some in the ensuing 10 years. For some there actually isn't resistance; rather, time is taken up with other matters. Some have never had contact with general health registries and the concept of epidemiology (i.e., the scientific and medical study of causes and transmission of disease within a population), so don't grasp the potential contribution of a registry. See the

article by Elizabeth Coolidge-Stolz on this topic.

Others fear that information on public record would be used negatively against a kennel/ breeder, perhaps reducing puppy sales and loss of reputation. Remember that the same can happen with the spread of unfounded rumors, which are much more difficult to eradicate.

While the fear of lost reputation and perhaps lost business from dog health information being public is realistic, there are solutions. Breeders who have been honest with puppy buyers about the occurrence of problems indicate that owners of normal dogs appreciated knowing of a potential health problem so if their dog became ill they could inform their vet. In contrast, there are owners of Addisonian Beardies who learn about Addison's from the breeder only after a dog is diagnosed, even when the breeder has known about the issue. Probably the most poignant event is when a breeder ceases communication with the owner after their Beardie nas a serious health problem diagnosed. Those owners feel lost and mystified by the break. On the other side of the coin are breeders who have done their best to inform puppy buyers and suggest ways to avoid potential triggers that might set off an autoimmune problem, only to learn that their advice was ignored by owner and veterinarian.

Over the years, I've seen other breeds with strong health programs. Several common features seem to lead to success. There is commitment to eliminate a specific health problem; for example, certain cancers in the Bernese Mountain Dog; a puppy brain disease in Portuguese Water Dogs; collie eye anomaly in border collies and several other breeds. That commitment is long term due to an organizational culture that persists regardless of leadership changes. An overriding theme is long term health of the breed.

In the last decade, there have been for Bearded Collies strong commitments among owners and some breeders to participate in research programs. Both the BCCA and BeaCon have supported breed specific or related research programs with funds and subject recruitment. Gradually these efforts will result in success with the first genetic problem, Addison's disease. As

you will read elsewhere in this issue, BeaCon has organized a survey on symmetrical lupoid onychodystrophy in Bearded Collies. To date, 53 owners have given time to completing the lengthy survey on 62 dogs. Now we need breeders to help complete health history on littermates and close relatives. Then we will search for researchers to evaluate the data and suggest what steps to take next.

Health Registries: What can we learn from human registries and why should we want one for Bearded Collies?

Elizabeth Coolidge-Stolz, MD
Director, BeaCon

Some countries routinely record their citizens' health information in a central registry. This registry information, much of it from northern Europe, has provided researchers with key data for understanding diseases and whether there are links to genetic or lifestyle factors or both. For instance, some critical early work that associated cigarette smoking with lung cancer and lung diseases such as emphysema was developed from Swedish registry data. In contrast, disease-specific registries record information on rare or poorly understood conditions; over time, enough information accumulates to allow researchers to analyze it. Fifteen years ago, I was one of the first women to enroll in a U.S. registry for women who used an antiepileptic drug during pregnancy. Years later, a body of information allows a woman and her doctor to make informed choices about which drugs to use before a woman even conceives.

Another example of the chain of events from registry information to improved healthcare is type 2 diabetes, also known as adult-onset or non-insulin-dependent. Registry information from nations like the U.S. with a long history of obesity to countries such as Japan, in which obesity became a problem more recently, showed the same pattern: The risk for developing type 2 diabetes goes up with rising body weight. Risk is higher for people who are overweight and higher yet for obese people. Research showed that excess body fat is associated with body tissues becoming resistant to insulin, the chemical that allows entry of glucose into cells. Even though type II diabetics make insulin, their cells cannot take in glucose properly and thus elevated glucose levels develop in the blood. At first, elevated blood glucose levels may only occur after eating. Eventually many people become diabetic

with both fasting and post eating blood sugar levels being too high. Elevated blood glucose levels are associated with disease of both large and small blood vessels, which accounts for observed complications of diabetes: heart attack and stroke (due to disease of large vessels) and eye and kidney disease (due to disease of small vessels). Current treatments for type II diabetes involve controlling blood glucose levels through weight loss, healthy diet, and, if needed, a medication that reduces insulin resistance. Conditions that negatively affect blood vessel health, such as cholesterol disorders and high blood pressure, need to be treated when also present.

The concept of gathering and using medical registry information clinically and for research is directly applicable to Bearded Collies and the people who love them. One of the reasons Sweden's health information was and is so useful to medical researchers is that it represents generations of people with a relatively common ethnic background. In the same way, Beardies have a common gene pool: they represent one breed. We know information from a single-breed registry is relevant to that breed, while general canine information may or may not be. Indeed, Beardies throughout the world have a very tight gene pool. One positive is the knowledge that all genetic information applies to all Beardies, wherever they live. If a condition known to have genetic links differs significantly in frequency in different parts of the world, researchers can consider what environmental factors play a role in development of the condition. Although it is a negative that there is such a tight gene pool, a large, representative registry can provide information that allows breeders to make the most informed breeding decisions possible regarding health conditions. We know hip dysplasia is due to the influence of multiple genes. Accumulation of information on Addison's disease that began with a broad-based survey by the American Bearded Collie breed club allowed researchers to learn that susceptibility to Addison's disease reflects the interplay of several genes. Ongoing research is trying to identify what genes are involved and to develop a test for at least the most influential gene.
We have an international open health registry for Bearded Collies run by BeaCon, a nonprofit Bearded Collie Foundation for Health. What we need is information for as many dogs as possible from as many parts of

the world as possible. This will enable us to develop a multi-generation pool of information that can accomplish two key goals; namely, provide breeders with information that allows them to make the most informed health-based choices for any prospective mating and, provide researchers with information that can allow them to advance health testing and healthcare for all Beardies.

All members of the Beardie community must ask at least some of the following questions occasionally. Then consider where you find the answers.

- Do I know the average life expectancy of my Beardie puppy? Is it longer than that of the generations before it, the same, or shorter?
- Do I know the most common causes of death and when deaths due to different causes are likely to occur?
- Do I know the five most common health problems?
- Do I know whether there is research to show genetic influences play a role or not?
- Are the diseases of yesterday the same as today?
- Are we improving the health of our breed?

BeaCon's open health registry is a source of answers to those questions. The only requirement for participation in BeaCon is that the dog be a purebred Bearded Collie with known parents. The owner and dog can reside in any country and the owner does not have to be a member of any Bearded Collie club. Indeed, every owner and every purebred Beardie with known parents should be in the registry. Having parent information enables breeders and researchers to use the health information to construct pedigrees and then make breeding decisions or conduct a genetic analysis. Every registry is only as good as the quality and quantity of its information, and the most comprehensive registries have shown their value in medical research time and time again.

One reviewer of an early Registry report commented "Excellent work? I wish all breeds could follow your example . . ." In answer to the question "What Needs Improvement?" the reviewer wrote "more dogs." A reviewer of the Year 1 Open Registry Book (fall, 2001) wrote "Your open registry represents several years of good work. The many volunteers who contributed to this open registry must be recognized for the

service they provided to their breed. Individual records, reproductive history, male reproduction, health problems & owner information are key ingredients to your database. . . The next step for your board would be to develop a strategic plan for your open database. It must include cumulative data and reports that begin to tell the story. Then there must be articles about how to use the system, how to interpret the data, and what each breeder needs to be doing. This is a great start, now the Board needs to develop a short and long range plan."

In the spring of 2010, the Year 9 Registry report will be published. BeaCon thanks the people who registered dogs and did the yearly updates that have allowed accumulation of longitudinal data, data that begin to tell a story over time rather than information for one point in time. There is a tutorial on the BeaCon website to walk prospective users through the registration process. The registration questionnaire is also available in a few languages other than English.

If it seems too intimidating to consider registering all of your dogs, do one at a time, perhaps a bitch before she is bred or a new puppy. The process is really quite short when a dog is healthy. Good health (hip scores, thyroid values, eye exam results) can be documented by sending the certificate or lab result form. Medical conditions can be documented by sending a lab form or veterinarian's letter. Owners can self-report diseases…. The quality of the documentation is recorded for each dog so each user of registry information can decide how to weigh it in their own thinking. Obviously, medical documentation helps the most. Sometimes, however, especially for a dog who has died or been ill for a long time, it is not possible to get the original paperwork. Each person should simply do the best they can in providing information. Many people call their dog's breeder when their dog gets sick. If you no longer have the health paperwork but sent copies to your breeder when your dog first got sick so they could better understand what was happening, consider asking

The heaviest dog ever recorded was an English Mastiff named Zorba: 343 pounds. (He was also the longest 8 feet 3 inches from nose to tail.)
Uncle John's Bathroom Reader

them to help document the dog's illness.

Truthful, quality information can help everyone. Ignorance and rumors about alleged health issues never help anyone. Ask questions about the registry and other efforts of BeaCon. Support it in any way you can. BeaCon is a registered charity [(501(c)(3)] corporation in the USA. Its information is available to everyone who registers. Do it for the dogs. They love us as much as we love them.

BeaCon Voluntary Open Health Registry Year 9 Condensed Report April, 2010

This is BeaCon's ninth year of reporting health conditions for Bearded Collies. The directors thank each Beardie owner and breeder who has made information available through the registry. The complete report is available on-line at www.beaconforhealth.org

What Dogs May Participate?

- **ALL BEARDED COLLIES** of known parentage
- Deceased or living
- Healthy or with a health problem
- From any country

Who May Submit Information?

- Owners with whom the dog lives.
- A co-owner (consent from primary owner is needed before the dog's record is public).
- A breeder. When a breeder enters pups prior to sale, if their contract notes the pup is in BeaCon's open registry that suffices as consent. Otherwise, consent from the primary owner is needed before the dog's record is made public.
- Primary owners can choose to enter a dog in a non-public section (started 2008). This is done by entering a co-owner name in the appropriate field. Information for non-public dogs (n=34) is included in the tabulation of diseases, causes of death, etc., but is not available through the search or report functions.

How To Submit Information. This may be done either by hard copy form or on-line at:

www.beaconforhealth.org/sqlweb.

Documentation. Copies of health screening test results are requested. This is especially important for dogs from countries other than the USA.

We attempt to validate the information for USA dogs through the on-line registry databases of OFA or CERF. Health screening tests that have not been submitted to another registry can be included in BeaCon's registry. Preferably, a copy of the exam form is sent to BeaCon; e.g., a copy of the CERF ophthalmologists' exam for an eye exam.

Use of search and report functions is free to anyone who is registered, starting March 2009. There are 160 registered users who do not have dogs in the open registry.

Pedigrees and Coefficient of Inbreeding (COI)

Pedigrees are generated with Breeder's Assistant, beginning January 2006. If an error is found in a pedigree, please notify E. Sell (beaconbb@bellsouth.net) with the correct information. The COI is the mathematical definition that elucidates closeness of relationship in a pedigree. It is usually expressed as a percentage; the higher the number the closer the relationship. Basic principles are that inbreeding only exists if the ancestor appears on both sire's and dam's side of the pedigree. The COI displayed at the top of the pedigree is calculated for 10 generations.

Resistance and Dilemmas

Uncertainty about entering dogs into this open health registry persists. People are fearful that a breeder and his/her kennel will be maligned. That is an honest fear because it has happened multiple times and across breeds. BeaCon's board encourages owners and breeders alike to give consideration to balancing such fear with the importance of establishing a record of the breed's health.

New breeders in particular face limited amounts or selectively offered information from which to make informed decisions. If you are a new breeder make sure that you ask to see the original health screening certificates for proposed mates. You can also check these certifications on the OFA Web site (www.offa.org) by entering a dog's AKC registration # or registered name. If you

"This is the beginning of a new day. You have been given this day to use as you will. You can waste it or use it for good. What you do today is important because you are exchanging a day of your life for it. When tomorrow comes, this day will be gone forever; in its place is something that you have left behind...let it be something good." Unknown

don't find the expected certification for a dog of breeding age it is prudent to suspect that the dog failed to meet the standard for that test. If the prospective mate has a CHIC #, be aware that the required tests do not have to be normal to obtain a CHIC #. You must ask to see the certificates (or do the online check). If you are in a country other than the USA and do not have on-line access to verify test results, then you should ask to see the certificate or letter or form with evaluation results.

Use of Data and Caveats

Viewers of the open health registry data are responsible for interpretation and use of the information. The purpose of this registry is to give objective data on disease and wellness, not to draw conclusions about any particular line, sire, or dam. Currency of health information is dependent on owner updating and every effort is made to reach owners of all living dogs in the registry. A caveat for disease frequencies is that they apply to this specific population of Bearded Collies. Whether the findings are applicable to the general population of Beardies awaits more entries from more countries.

We caution the reader that a sire or dam cannot be assumed to be a carrier of an undesirable genetic trait simply because that health problem is reported in a single progeny. Furthermore, the expression of many genetic diseases may be influenced by environmental factors, many of which are still unknown. Even when several dogs from the same line are reported with the same problem, you cannot assume that the problem occurs with high frequency in that line. You have to know the status of the other dogs from that line, too. Many hereditary problems, other than those transmitted by an autosomal dominant mode of inheritance, involve healthy parents, one or both of whom are carriers of the genes responsible.

The inclusion of dogs in this registry is by the free choice of the owner/co-owner. Absence of dogs from this registry is also by the free choice of the owner/co-owner. Notice of the registry's availability is made through BeaCon's newsletter (Lighting the Way) and web site Beardie internet lists.

"I find the great thing in this world is not so much where we stand, as in what direction we are moving."
Oliver Wendell Holmes

Notice of Copyright

Respectfully submitted,

the Board of Directors for the Bearded Collie Foundation for Health (BeaCon)

Cindy Alspaugh
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Elizabeth Coolidge-Stolz
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Karen Drummond
Judy Howard
Jana Jezkova
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March 15, 2010

SLO and Control Blood Samples

Dr. Oberbauer's lab is willing to receive and store blood samples from Beardies with SLO of any age (biopsy proven or veterinarian diagnosed by clinical findings), and from normal Beardies over the age of 7 years. If there is enough interest and sample collection, we will work on funding for a DNA study, similar to the work already done on Addisonian and hypothyroid Beardies. If you would like to participate, contact Elsa at:

beaconbb@bellsouth.net

for information about blood sample needed and paperwork.

SLO – Breeder Help Needed

As noted in the reflections column and year 9 report of the open registry, BeaCon is asking for breeder's help to gather information on health of affected dog's littermates and family. Cindy Alspaugh is coordinating the breeder surveys and has attempted to contact breeders by email. Some have responded; other haven't yet. With SLO the second most common autoimmune problem reported in the open registry, breeder cooperation is needed to help solve the problem.

If an owner with a Beardie having SLO has not yet completed a survey, contact either Cindy or Elsa (email addys at the end of the newsletter.

How Many Beardie Collies are Registered in the USA and UK?

Data for the last 10 years are included (see the on-line report for earlier years). Denise Barley provided the UK figures.

USA

Year	# Dogs Registered	# Litters Registered	# Pups in Litters	Av # pups/ Litter
2009	331	78	445	5.7
2008	393	82	421	5.1
2007	413	110	603	5.5
2006	447	90	537	5.2
2005	485	109	658	6.0
2004	562	150	842	5.6
2003	543	154	897	5.8
2002	587	159	943	5.9
2001	620	165	953	5.8
2000	682	183	1031	5.6
1999	614	196	1202	6.1

UK

Year	# Dogs Registered	# Litters Registered	# Pups in Litters	Av # pups/ Litter
2009	528	90	528	5.9
2008	643	113	643	5.7
2007	606	98	606	6.2
2006	720	119	720	6.1
2005	650	113	650	5.8
2004	821	129	821	6.4
2003	668	109	668	6.2
2002	901	140	901	6.4
2001	721	121	721	6.0
2000	952	150	952	6.4
1999	1034	175	1034	5.9

Number of Owners and Dogs

There are 606 participating owners, an increase of 46 from the previous year, and 1570 Beardies, an increase of 144. The geographic distribution of owners is given in the full report. There was little change from last year in the frequency of the most common health problems; fear issues and autoimmune problems continue to lead the list. The frequency of health screens is also little changed. Puppy mortality is 5% stillborn and an additional 7-8% dying by 6 weeks of age.

Demographic Information

Item	#	
Dogs	1570	
Location		% of total dogs
USA	753	48.0
United Kingdom	329	32.0
Netherlands	89	5.7
Australia	83	5.3
Canada	83	5.2
Germany	59	3.7
Czech Republic	57	3.6
Finland	37	2.4
Belgium	22	1.4
Others	59	3.8
Sex - male	705	44.9% of all dogs
intact	399	25.4% of male dogs
castrated	294	41.7% of male dogs
unknown	12	
Sex - female	865	55.1% of all dogs
intact	435	50.3% of female dogs
spayed	420	48.6% of female dogs
unknown	10	

Healthy.

The percentage of healthy dogs was 47.4% in year 7, 55.8% in year 8, and 53.4% in year 9. This trend toward healthier Beardies may reflect an increased entry of younger dogs and/or failure of owners to update and provide information about health problems.

Health Problem Frequency is calculated if there are more than 20 cases. Some owners entered health problems only into update notes, so that information was transferred to a health record for a more accurate accounting.

Health Problem	# of Dogs	% of All Dogs
None	838	53.4%
Fear, loud sharp noises	185	11.8%
Autoimmune diseases (see separate section)	181	11.5%
Hypothyroidism*	116	7.4%
Cancer (all types)**	115	7.3%
Umbilical hernia	64	4.1%
Hip dysplasia	53	3.4%
Dietary allergy/food intolerance	32	2.0%
Cataract	32	2.0%
Aggression, all types	30	1.9%
Atopy	29	1.0%
Fear, other	26	1.7%
Allergy, flea bite	25	1.6%
Depigmentation	23	1.5%
Inflammatory bowel disease	22	1.4%
Teeth, overshot	18	
Vaccination reaction	17	
Pyometra	17	
Hearing loss	16	
Cognitive dysfunction	15	
Cryptorchid	15	
Hot spots	15	
Nail problems, other	13	
Monorchid	14	

Health Problem	# of Dogs	% of All Dogs
Hyperactivity	13	
Cushing's disease	13	
Kidney failure	13	
Obsessive compulsive	11	
Epilepsy, idiopathic	11	
Exercise induced collapse	8	
Diabetes mellitus	2	

Note: Some cases of depigmentation can be autoimmune in nature (e.g., vitiligo, or associated with lupus or pemphigus). Since there are other causes of depigmentation, it was not placed into the table with autoimmune diseases. Cataracts – age of onset wasn't given for 5, at or over the age of 8 in 17 (i.e., related to older age most likely), and under the age of 8 in 10. An additional 6 had punctate cataracts.

* The incidence of autoimmune thyroiditis in the open health registry dogs is unknown; data from OFA labs suggest it is of relatively low incidence – 1.3% of 380 having OFA panels (with 1.1% idiopathic hypothyroidism, 13.7% equivocal, 83.9% normal).

**** Cancer diagnoses are listed below (see the online OHR search facility for a look at the less common cancers - select cancer, other). To assure an accurate count, the cancer causes of death are checked against a dog's health problem list. If such a diagnosis had not been added to the health problem list by the owner, it was added by the database administrator.

- mammary – 11
- nasal – 11
- liver - 10
- stomach - 9
- skin (various types) - 8
- bone - 7
- spleen – 7
- hemangiosarcoma – (plus 1 of liver and spleen), fibrosarcoma or sarcoma – 4
- kidney, testicular, pancreas (1 was insulinoma) – 3 each
- abdominal, small intestine – 2 each
- other - 44

With the low necropsy rate and the fact that either a primary site is unknown or the diagnosis was "suspected" cancer, it is not possible to be certain which are the most prevalent cancers in the breed.

Autoimmune (A/I) Disease

The number of individual A/I diseases was 216. The number of dogs having A/I disease(s) was 181, or 11.5% of all dogs. Although the frequencies appear to be unduly high in this population of Bearded Collies, it is not known if the figures are applicable to the general population of Bearded Collies worldwide. There was a small increase in the number of cases for most diseases this year; the increase for SLO was greater, likely due to the research focus on SLO for the past year and a half.

Disease	#	% of All Dogs	#(%) with >1 A/I disease**
Addison's disease (hypoadrenocorticism)	69	4.4%	11 (15.9%)
Symmetrical lupoid onychodystrophy (SLO)	48	3.1%	8 (16.7%)
Inflammatory bowel disease (IBD)	22	1.4%	6 (27.2%)
Autoimmune hemolytic anemia (AIHA)	20	1.3%	5 (25%)
Systemic lupus erythematosus (SLE)	18	1.2%	5 (33.3%)
Rheumatoid arthritis*	12	0.8%	5 (41.7%)
Immune-mediated thrombocytopenia (ITP)	10		6 (60%)
Pemphigus	7		4 (57%)
Discoid lupus erythematosus	4		2 (50%)
Myositis	3		1 (33%)

* These include cases of suspected immune polyarthritis

**This does not include hypothyroidism because thyroid panels were not available until recent years.

25 dogs had more than one disease:

- 18 dogs had 2 A/I diseases
- 5 dogs had 3 A/I diseases
- 2 dogs had 4 A/I diseases

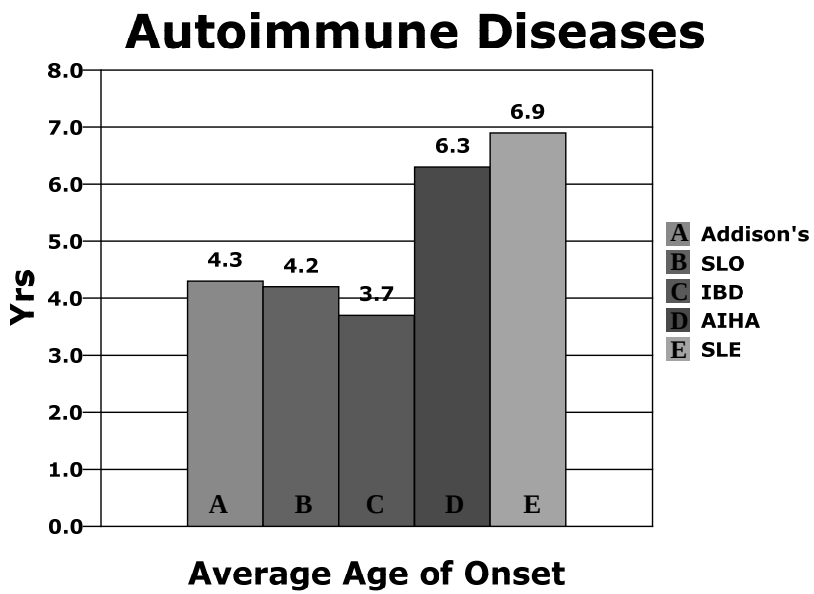
Addisonian dogs

- 16 (23.2%) are hypothyroid
- 20 (29%) have fear of loud sharp sounds
- 9 (13%) have at least one other A/I disease

SLO dogs

- 6 are hypothyroid
- 3 each have pemphigus and Addison's
- 2 have rheumatoid arthritis
- 1 each has SLE and AIHA

Average Age of Onset



A younger average age of onset exists for Addison's disease, SLO, and IBD in this population of Bearded Collies; the average for AIHA and SLE is 2 years or more higher.

Health Screening Tests

Screening Test Done	#	% of All Dogs
Hips	601	38.3%
Eyes	544	34.7%
Thyroid	397	25.3%
Elbows	121	7.7%
Hips and eyes	305	19.4%
Hips and elbows	183	11.7%
Hips and thyroid	117	7.5%
Hips, eyes, and thyroid	144	9.2%
MDR-1	22	
Von Willebrand Disease	11	

The frequency of individual health screening tests and the various combinations were minimally changed from the previous year. Mutation of the MDR-1 gene results in an inability of the blood-brain barrier to exclude certain drugs (such as ivermectin) from the CNS resulting in neurological disease. In rough and smooth Collies one in five dogs carries this gene mutation. No tested Beardies have the MDR-1 mutation, and the same was true for the 97 purebred Bearded Collies tested for the mutation at the 2006 BCCA national specialty.

Reproductive Outcome

Dogs. There were 129 with reproductive history recorded; only 56 had

semen checked and few of those had much detail; 129 were bred. The following table shows the number of bitches bred, the number of litters and puppies produced

Item	#	Av
Bitches bred	430	3
Litters produced	390	3
Total puppies produced	2288	21
Total female puppies produced	989	10
Total male puppies produced	993	10

Not all breedings resulted in a pregnancy. For some dogs the number of puppies produced was not given.

Problems developing in the dogs' progeny were:

Health Problem	# dogs producing problem	# progeny with problem
Addison's	7	14
SLO	8	13
SLE	2	2
Hypothyroid	10	11
Other	11	15
Cryptorchid	16	34

Bitches. 260 bitches were successfully bred; they produced 484 pregnancies for 421 litters and 2777 pups. Cesarean section delivery was done in 45 (10.7% of all litters). Breeding methods that resulted in live pups were: Natural - 297 (70.6%); A/I fresh - 48 (11.4%); A/I chilled - 19 (4.5%); A/I frozen - 11 (2.6%); A/I operative - 13 (3.1%); Natural and A/I fresh - 12 (2.9%); unknown – 44.

The number of progeny and early identifiable issues are given in the next table.

Male pups		
	#	% of total
total born	1439	-
live born	1336	92.8%
live @ 6 wks	1236	85.9%
		% of those alive at 6 weeks with problem
cryptorchid	73	5.9
mismark	60	4.9
umbilical hernia	51	4.1
bad bite	14	
poor pigment	12	
cleft palate	3	
Female pups		
	#	% of total
total born	1338	-
live born	1268	94.8%
live @ 6 wks	1169	87.4%
		% of those alive at 6 weeks with a problem
mismark	63	5.4
umbilical hernia	52	4.5
bad bite	13	4.1
poor pigment	5	
cleft palate	2	

Specific later health problems in the progeny of bitches are shown in the next table.

Health Problem	# dams	# progeny
Addison's	11	16
SLO	10	13
SLE	4	4
Hypothyroid	9	10
Other	26	25**

* One bitch produced 6 Addisonian puppies

** Among the early, potentially congenital or heritable conditions were:

- 6 heart problems (3 PDA; 1 persistent right aortic arch; 1 murmur, diagnosis unknown; 1 heart anomaly, diagnosis unknown)
- 3 exocrine pancreatic insufficiency
- 2 renal dysplasia
- 1 each - hyperthyroid, discoid lupus, autoimmune hemolytic anemia, pyelonephritis (early death at 3 wks), kidney failure (several died as young dogs), myositis, hip dysplasia, ulnar shortening.

Mortality

There were 381 (24.3%) deaths reported. The average age at death was 11.7 years. Some owners didn't provide information about cause of death. Other dogs may also be deceased but their owners have not responded to update requests.

Necropsies were conducted on 25 (6.6%) of the deceased dogs. Owners should remember that necropsies will sometimes be helpful in establishing the cause of death. If more necropsies were done in those where death is not due to very old age or is "unknown", there would certainly be more identifiable causes of death.

Mode of death was natural in 56, euthanasia in 283, accidental in 15, and not documented in 27.

Owners sometimes gave age of death, or month and year, or only year of death. For those, an estimated exact date of death was calculated from the information given by an owner by assigning the date as the first day of the month (if month and year were given) or assigning the date as 1/1/ yyyy (if only year was given). In no case did the assignment of estimated exact date of death change the age group that the dog was in for purposes of evaluating causes of death.

Of note were three cases of gastric torsion (1 with stomach cancer) in older Beardies (ages 10.8, 14, and 15 years). Bloat/gastric torsion is very uncommon in Beardies; the possibility of its occurrence in the older dog should alert owners to be aware of the signs and to seek emergency care immediately.

The leading causes of death before 9 years of age were autoimmune (n=20) and accidental (n=10). The high number dying from autoimmune

disease at a young age is of concern and we should focus on supporting research to identify cause(s) of the problems, and hopefully elimination of these problems where feasible.

Age Group – 0 to 3 yr

There were 12 deaths (3.2% of total with cause of death recorded).

- Accidental – 3
- Autoimmune – 3 (1 each pemphigus/SLO, IBD, Addison's)
- Aggression, directed at dogs' family – 2
- 1 each intussusception (after hemorrhagic gastroenteritis), epilepsy idiopathic, meningitis, pyometra.

Age Group – 3-7 year

There were 30 deaths (7.9% of total)

- Autoimmune - 10
  - SLE – 3
  - AIHA – 2
  - 1 each: SLO with aggression due to pain, ITP, Evan's syndrome (ITP & AIHA),
- Addison's, IBD
- Accidental – 5
- Unknown – 2
- Cancer – 3 (10% of age group)
- Poisonings – 2
- 1 each: acute renal failure, chronic interstitial nephritis, respiratory failure (in an Addisonian), acute fulminating pancreatitis after whelping, neurologic other (had hip dysplasia and developed rear paralysis from a pinched nerve), liver failure, sudden acute retinal deterioration (unable to deal with visual loss), chronic pancreatitis.

Age Group – 7-9 yr

There were 27 deaths (7.1% of total)

- Autoimmune – 7 (25.9% of age group)
  - Addison's – 3 (either primary cause or associated)
  - 1 each – autoimmune muscle disease, AIHA, rheumatoid arthritis, SLE
- Cancer – 5 (18.5% of age group)
- Unknown – 4
- Accidental – 2
- 1 each: family aggression, pet food poisoning, rear end paralysis,

sepsis, sudden breathing distress, after surgical A/I, pyometra, unidentified illness for 6 mo, pancreatitis & kidney failure

Age Group – 9-14 yr

There were 190 deaths (49.9%)

- Cancer 58 (30.5% of age group)
  - Nasal – 11 (1 of those has severe nose bleeds but no confirmed dx)
  - 5 – spleen
  - 4 – liver
  - 3 each – bone, hemangiosarcoma, stomach, abdominal
- Remainder had only 1 or 2 cases
- Autoimmune – 18 (9.5% of age group)
  - Addison's – 7 (1 with kidney failure)
  - AIHA – 4 (1 with ITP [Evan's syndrome])
  - SLE - 3
  - Diabetes, IBD, pemphigus, rheumatoid arthritis – 1 each
  - Cognitive dysfunction – 6
  - Old age – 17 (av age = 13.2 yrs)
  - Stroke – 9 (av age = 13.0 yrs)
  - Other, unknown, mostly single diagnoses - 79

Age Group >14.0 yr

There were 115 deaths (30.2%)

- Old age or cognitive dysfunction – 63 (54.8% of age group)
- Cancer – 18 (15.7% of age group)
- Stroke – 8
- Other or unknown - 26

No age Given for Death (n=8)

As in previous years, the majority of deaths from autoimmune causes occurred prior to 9 years of age.
The vast majority of cancer deaths occurred in those 9 years and older.

Coefficient of Inbreeding (COI)

The data for the USA 1997 AKC stud book were calculated by trying to use just one dog from each litter so as to represent unique breedings. There were 939 Bearded Collies registered as foundation stock as of October 1, 1976. COI's are based on 10 generations.

Year Report/Other	# dogs	Av	Min	Max
USA – 1977 stud book	318	18.3	3.8	40.1
All dogs	1570	23.4	0	47.3
USA	746	23.5	11.2	42.8
UK	311	24.9	0	40.5
Netherlands	88	20.9	9.2	36.0
Canada	81	23.3	9.2	35.2
Australia	83	22.3	12.4	42.1
Germany	58	20.2	10.8	38.4
Czech Republic	56	22.6	12.2	47.3

Research on Autoimmune Disease. Two frequently reported A/I diseases, Addison's disease and SLO, are the subject of several research projects.

Summary of Dr. Oberbauer's Research on Bearded Collies

Introduction. Autoimmune disorders occur when the body's defense system (the immune system) becomes mistargeted and attacks one or more body tissues instead of foreign invaders such as bacteria and viruses. Hypothyroidism, abnormally low function of the thyroid gland, is an example that has been raised as a concern by breeders of different breeds; the disorder also occurs in dogs of mixed breeds. Hypoadrenocorticism, abnormally low function of the cortex (outer tissue layer) of the adrenal gland, is commonly known as Addison's disease. Like hypothyroidism, it can occur as an autoimmune disorder in Bearded Collies: The immune system becomes mistargeted and attacks the cells of the adrenal cortex, destroying this tissue over time.

We know from breed-specific research such as that done in Bearded Collies that some dogs may develop more than one autoimmune disease. This medical evidence suggests that different autoimmune diseases may reflect the activity of a common set of susceptibility genes. In an individual dog, the result of gene expression depends on the whole set of genetic mutations (the abnormal forms of genes) present in the dog and the dog's exposure to and response to environmental triggers.

Summary Regarding Generalized Autoimmune Dysfunction. The 12-month Acorn grant was used to examine the entire canine genome in Bearded Collies (using technology called SNP microarrays) to search for chromosomal regions associated with hypothyroidism. No significant linkage was detected for any chromosomal region when evaluating either hypothyroidism alone or hypoadrenocorticism alone when compared with DNA from dogs that had neither condition.

However, when dogs that had both hypothyroidism and hypoadrenocorticism (dogs considered to have a generalized autoimmune condition) were examined in comparison to dogs without either condition, a specific chromosomal region (2.7 MB in length) demonstrated a statistically significant association with the presence of generalized autoimmune status. Dr. Oberbauer and her colleagues hypothesize that a set of susceptibility genes common to autoimmune disease exists within that region and they are planning to map this region in finer detail.

Summary Regarding Addison's Disease. In Bearded Collies, Addison's disease is a disorder characterized by inadequate amounts of two types of hormones produced in the adrenal cortex, one that helps balance glucose levels within the body (called glucocorticoids) and another that helps balance electrolyte levels in the body (mineralocorticoids). Evidence from the human literature pertaining to autoimmune diseases suggests susceptibility rests with a set of genes that express differently depending upon environmental triggers. The 12-month Acorn grant examined the entire canine genome with the same technology used to search for chromosomal regions associated with hypothyroidism and hypoadrenocorticism in the Bearded Collie. Four distinct chromosomal regions were significantly associated with the presence of hypoadrenocorticism; two were identified in past research (CFA 12 and another that is the subject of ongoing collaboration), one was also detected in the current research when categorizing dogs with hypothyroidism and hypoadrenocorticism together as a generalized immune condition (see above), and a fourth region was identified that has not been previously implicated. It is currently being fine mapped.

Taken together, the data from the last 12 months of research are substantial and suggest that a set of susceptibility genes common to autoimmune disease exists. In addition, a second set of genes more specific for development of hypoadrenocorticism in the Bearded Collie also appears to exist.

Symmetrical Lupoid Onychodystrophy (SLO).

BeaCon initiated a survey of Beardies with SLO or a chronic nail problem that clinically resembles SLO in 2008. The short term goals are to establish a baseline of clinical findings and other factors that are possibly associated with SLO expression (e.g., vaccination, allergic problems, stress, family history of similar disease).

Ongoing are breeder interviews to learn if a similar condition exists in littermates, parents, and other close relatives. Breeders are being contacted only if the SLO dog's owner gave permission. Breeders are free to contact Cindy Alspaugh (stonebaybeardies@yahoo.com) if they have cases/information to contribute. Breeder cooperation is essential. Let's make this health problem different from the startup of study of Addison's disease. Possibly a third step will be to identify and obtain similar clinical information from a group of healthy controls. Finally, all data will be put into a report, along with family pedigrees for study by genetic researchers.

SLO Survey Results

The information below comes from 59 Bearded Collies with completed surveys as of mid-February 2010. There were 49 owners (30 USA, 7 UK, 3 each Netherlands and Canada, 2 or 1 from other countries). Some owners have yet to return surveys, so the number will increase later on. Some dogs from the open registry who have SLO but no survey will be included in family pedigrees.

Age of Onset was before 8 years in 88.8%. The average age was 4.1 years in 46 dogs in whom exact age of onset is known. Diagnosis. Twelve dogs had nail biopsy. Others were diagnosed by clinical response to treatment regimens for SLO. Reluctance on the part of owner and/or veterinarian to do a biopsy led to clinical response as the diagnostic means. This is not ideal from a research perspective, yet it is the practicality of everyday life.

Environment. All dogs lived in homes; 41 were either born at home or placed in their home by 9 weeks of age. Others were placed later and six dogs were rehomed as adults. There were no differences in house flooring exposure or in outdoor surface exposure before or after onset of SLO.

General Health. The table shows other health conditions experienced.
*One hypothyroid dog also had atypical Addison's. 17 others were normal thyroid.

Condition	# (% of total)
Ear infections	13 (22%)
Hypothyroid*	6 (10.2%)
Weepy eyes	6 (10.2%)
Skin infections	5 (8.4%)
Eye infections	4 (6.8%)
Atopy	3 (5.1%)
Crusty nose	3 (5.1%)
AIHA, Lyme disease, dental problems	2 each

A/I Problems In Relatives. There were 33 dogs who had relatives with an A/I problem. Five dogs with SLO produced progeny with SLO and six dogs with SLO produced other A/I problems.
*5 of these had more than 1 relative with SLO
**2 of these had more than 1 relative with Addison's
***2 of these had more than 1 relative with AIHA

A/I Problem in Relative	# (% of total)
SLO*	9 (15.3%)
Addison's**	7 (11.9%)
AIHA***	5 (8.4%)

Vaccination and Preventive Use. Interestingly, 15 (25%) of the dogs never received rabies vaccination; 34 received rabies boosters (after the initial puppy vaccination) every 3 years. The other vaccination schedules were so varied and with different (or unknown) products that it will take a research team to evaluate. Other antecedent events within six months of SLO onset were vaccination in 19, showing/trialing in 12, rehome or move in 5, and miscellaneous events in some others. Heartworm preventives were used in 33 (55.9%) and flea/tick preventives were used in 41 (69.5%).
Nail Clinical Findings (either initially and/or during course of disease). Total # = 62.
The clinical findings are similar to those reported in peer reviewed published papers on SLO in multiple breeds. Most dogs in the BeaCon survey had more than one clinical findings and involvement of more than one paw.

Clinical Sign	# dogs	% of all dogs
Pain	54	87.0%
Abnormal nail growth	49	79.0%
Nails fall off	49	79.0%
Split	44	71.0%
Bleeding	44	71.0%
Persistent licking	39	62.9%
Lameness	34	54.8%
Infection	33	53.2%
Offensive odor	13	21.0%

Recurrence. There was no recurrence in 11, and either the problem was ongoing or recurring in 51 others; in 4 there was no information about recurrence. Some of those with ongoing disease referred just to the persistence of abnormal nails without other signs of disease.

Treatment. The dog's medical management was by a generalist in 43 (3 had treated SLO in other dogs; 5 also saw a dermatologist), dermatology 16, internist or other, 2 each; not specified in others. A wide range of treatments were used (see table); dosages and duration were quite varied. Several dogs had loose nails removed surgically.

Treatment	# (% of total)
Fatty acids (e.g., fish oil capsules)	50 (80.7%)
Tetracycline type antibiotic	38 (61.3%)
Niacinamide	26 (41.9%)
Antibiotic other than tetracycline	25 (40.3%)
Pain control	19 (30.7%)
Antifungal	11 (17.7%)
Prednisone	8 (12.9%)
Vitamin C	6 (9.7%)
Trental (pentoxyfylline)	4 (6.5%)

Family History.

This aspect of the survey work is incomplete because breeder information remains to be collected about littermates of the affected dogs. The following table shows that some cases (n=47) fit into families, thus supporting the concern of some participating breeders that genetics has a contributing role in expression of the disease. Families are "named" by a letter for convenience. There are some ancestors common across several families too.

Family	# SLO cases
A	6
B	10
C	9
D	2
E	3
F	2
G	3
H	5
I	2
J	2

Finnish Study of SLO in Bearded Collies

A recently completed study documented similar findings with respect to young age of onset and the most prominent early symptom as claw (i.e., nail) pain that was manifest by licking of the paws, lameness, whining or screaming when running or playing or upon pressure to the paw. Nail regrowth was abnormal in 13/14 dogs. The painful phase was 2-6 months. Antibiotics were given to all dogs at least briefly, pain medications to 13/14, and corticosteroids to 4. Maintenance medications were supplement fatty acid preparations and/or oils and vitamin B preparations, either continuously or periodically. Pedigree study suggested that one or several recessive genes were involved. This paper was published in the Finnish Beardie Magazine in the fall of 2009. It will also be submitted by the author (Suvi Taponen, DVM, PhD and Nina Janger) to a peer review journal.

Additional SLO news. (Original text by Prof Hannes Lohi, Niina Ryynala, and Genoscoper Ltd. Published in the Finnish Bearded Collie Club magazine 1/10; translation by Pertti Kellomaki). The Finnish Bearded Collie Club funded a study of genetic variability of Bearded Collies living in Finland. Major Histocompability Complex (MHC) genes were studied. The MHC region is located on chromosome 12 and consists of more than 100 genes which can be categorized into class I, II, or III according to function and location. MHC diversity is typically measured by

studying certain MHC class II genes. The dog MHC region is known as DLA, Dog Leukocyte Antigen. One goal of the study was to find out how many dogs are homozygous for each haplotype – meaning a group of alleles of different genes on a single chromosome that are closely enough linked to be inherited together.

Most Bearded Collies are heterozygous, that is, they have different haplotypes in the two corresponding chromosomes. However, 30 individuals (39%) were homozygous, so about one third of the dogs carry identical haplotypes in their chromosomes. The distribution of haplotypes among homozygous dogs is as follows: Parta1 60%, Parta2 36.7%, and Parta3 3.3%. The sixteen SLO dogs in the study had only the two most common haplotypes, Parta1 and Parta2. Moreover, eleven out of sixteen SLO dogs were homozygous for type Parta1 Parta1 or type Parta2 Parta2. The other five SLO dogs were heterozygous and haplotype Parta1 Parta2.

A possible preliminary interprettation is that homozygosity in the MHC II locus increases the risk for SLO in Bearded Collies. Future research should measure variability in other parts of the genome with other markers and compare results with the MHC II diversity findings. (Note: we thank a Finnish Bearded Collie Club for kindly sharing the report with BeaCon. Additional details will be available.

Donations

Contributions to BeaCon and the open health registry should be mailed to:

Judy Howard

(beardiebunch@gmail.com)

2141 Moonstone Dr, Concord, NC 28025

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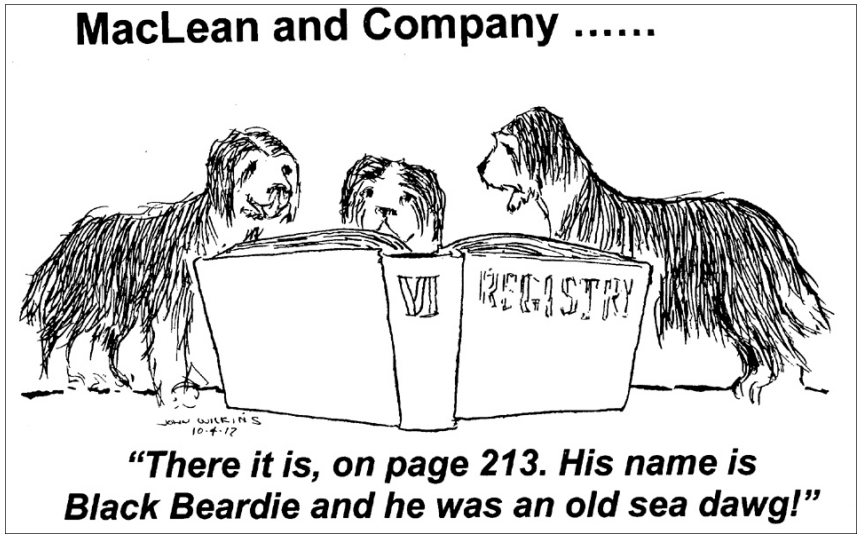
A stroll down memory lane with MacLean & a new one.



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