

Questions? Comments?
 Suggestions?

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PRESIDENT'S MESSAGE

Westie owners are an important source of information that we with the Westie Foundation value. Each of us has had many experiences with our Westies, medical and otherwise, that would be helpful to other owners. Please consider sharing those stories for the **Westie Wellness** newsletter. Please let me know if you would like to submit an article. We love our dogs and any medical emergency or disease affecting them can be really scary. Remember, you and your Westie are not alone. I can almost promise that someone else has traveled the same road. You can email me at president@westiefoundation.org or bjpinter@msn.com. I look forward to hearing from you.



Bebe Pinter

In this issue of the newsletter, Dr. Kay McGuire addresses the use of cannabidiol (CBD) products for animals with her report “The Use of CBD in Dogs, Is This A New High?” There is some evidence that CBD is beneficial—an interesting read.

Dr. Claire Wiley provides the article “Early Detection of Urothelial Carcinoma and Juvenile-Onset Nephropathy” that was her presentation for the WFA seminar last October at Kimberton, Pennsylvania. Dr. Wiley defines both diseases, discusses diagnosis and treatment, and recommendations for Westies. She said that Juvenile-Onset Nephropathy diagnosis is challenging to diagnose, has a highly variable age of onset, and affected dogs could be bred before they show any clinical signs.

Take note of the article “New Research Identifies the Most Common Illnesses Suffered by Westies” by Arlo Guthrie, VetSurgeon News. Dr. Dan O’Neill, Senior Lecturer and VetCompass researcher at the Royal Veterinary College (RVC), UK was the main author of the paper. Coauthor Camilla Pegram, Veterinary Epidemiologist and RVC VetCompass researcher said: “the most common disorders of Westies shown in this study are also common in the wider UK dog population. However, the breed does seem predisposed to lower respiratory tract disease which was a common cause of death in the Westie. Owners should be aware of this issue as their Westie ages.” You can access the complete 12-page study as listed under Reference at the end of the article. There is a correction noted if you search for the research paper.

Read “What Is The Skin Barrier And Why Does It Matter?” by Valerie A. Fadok, DVM, PhD, Diplomate, ACVD. This article is very timely as spring is approaching. She discusses What is the Skin Barrier? How Can We Repair It?, A Special Role for Spot-Ons, and Conclusions. Dr. Fadok said, “We know that there are many genes involved in the abnormal allergic response, and the same is true for the skin barrier.”

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On the subject of atopic dermatitis (AD) check out the article “Journal Scan: Bad Dog? Puritus May Be To Blame.” Based upon a study, conclusion showed a direct link between itch associated with AD and problem behaviors. Follow the link in the article for the full study.

Thanks to Mary Ann Neal for sharing “A Lifetime’s Journey” about her 14 year old Westie girl Maura. Mary Ann shares her journey to help keep her girl healthy, happy and doing a job(s) Maura likes. Many of us are living with senior Westies. Mary Ann’s devotion to Maura is an inspiration! *We are saddened to report that Maura crossed the Rainbow Bridge on January 30, 2020. Condolences to Mary Ann and breeder Allison for Maura’s life well lived.*

The WFA has provided grants to three AKC Canine Health Foundation research projects that have submitted progress reports as follows: (1) Grant 0239-T: *Targeting Cancer Epigenome: The Effect of Specific Histone Lysine Methyltransferase Inhibition in Canine B-Cell Lymphoma*, (2) Grant 02597: *Molecular Epidemiology of Methicillin-resistant Staphylococcus Pseudintermedius in the United States*, and (3) Grant 02651: *Discovery of Novel Biomarkers of Canine Atopic Dermatitis through Lipid Profiling*. These are mid-year reports.

Thank you for your continued involvement and support of the WFA but most of all, your love of Westies!

Bebe Pinter

 YOUR DOG AGE CALCULATOR CHART 					
Years	Breed Size (in lbs)				
	Toy (3-10)	Small (11-25)	Medium (26-50)	Large (51-100)	Giant (100+)
1	15	15	14	14	12
2	24	24	23	22	20
3	28	28	28	28	28
4	31	32	33	34	35
5	35	36	37	39	43
6	38	40	42	45	50
7	42	44	46	50	58
8	45	48	51	56	65
9	49	52	55	61	73
10	52	56	60	67	80
11	56	60	64	72	88
12	59	64	69	78	95
13	63	68	73	83	103
14	66	72	78	89	110
15	70	76	82	94	118
16	74	80	87	100	125
17	78	84	91	105	
18	82	88	96	111	
19	86	92	100	116	
20	90	96	105	122	

Source: <http://www.vnessentials.com/Gui/Content.aspx?Page=DogAge>

The Use Of CBD In Dogs, Is This A New High?

By Kay McGuire, DVM, MS

As marijuana use laws are readily changing across the United States, there are 11 states and the District of Columbia where recreational use is lawful. As of July, 2019 there are 18 states which allow for medical use of marijuana in humans. The most common human applications of medical marijuana are uncontrolled epilepsy and chemotherapy induced nausea.

There has been a huge push of cannabidiol (CBD) products for animal treatment. There is no direct evidence for cannabis use in dogs and cats, though there is evidence of toxicity of marijuana. Dogs have increased THC receptors in the brain. There is no regulated animal use of CBD products for the veterinary professional and their use in animals is entirely experimental.

“*Cannabis sativa* has been used by humans for thousands of years for many therapeutic purposes. The discovery of cannabis-specific compounds, such as phytocannabinoids, and an endogenous cannabinoid system (ECS) have led to increasingly targeted research on the medical effects of cannabis and cannabinoids.

More specifically, you may have heard about the phytocannabinoid cannabidiol (CBD) and how it could have positive impacts on human and animal health. Many people believe CBD binds cannabinoid receptors found in the ECS, but research continues to emerge on just how CBD functions within the body. So, let’s dive in to the most important question, “How does CBD work?”

Scientists have found that CBD has the ability to interact with G-protein-coupled receptors such as GPR55,



which have been shown to play a role in behavior, bone density, seizure control and pain reduction. CBD also interacts with the 5-hydroxytryptamine (5-HT) family, which can affect serotonin levels that play an important role in mood, happiness and wellbeing.

Developing a CBD product for animals is about safety first. Research still needs to be done.

There has been a double-blind, placebo controlled study of a CBD product for osteoarthritis in a small group of 22 dogs. This small group had a 27 percent dropout rate as only 16 animals finished the 10 week trial. These dogs were also allowed to use non-steroidal anti-inflammatories or nutraceuticals like chondroitin and the treatment group received CBD at 2mg/lb twice daily. The participants received a placebo or treatment for 4 weeks, allowed a two week wash out period, then the groups were reversed. Both owners and veterinarians felt the animal was less painful on the CBD treatment but the degree of lameness did not change. This study was properly formatted using a double-blind study, a placebo, and

randomization to prevent bias but the small sample size increased the risk of random error.

The one thing noted is the lack of adverse side effects in all dogs which may indicate the treatment was not active or did not properly detect side effects.

Another trial with CBD for the use in refractory epilepsy in dogs was published in 2019. This study again was a small group of dogs which met the required parameters. All participants had to be identified as idiopathic epileptic diagnosed by MRI, a cerebral spinal fluid analysis, and other diagnostics to rule out causes of seizures. The outcome revealed that dogs which had refractory seizures of 4 or more seizures per month decreased to 2.7 seizures per month. These dogs were dosed with CBD at 2.5mg/kg every 12 hours for 12 weeks.

With this study showing some evidence of that CBD might benefit seizure control activity, it has led to the Canine Health Foundation grant 02323: Efficacy of Cannabidiol for the Treatment of Canine Epilepsy. This study is being conducted at the Colorado State University under the principal investigator Stephanie McGrath, DVM, MS. The grant period ends in November, 2020; hopefully significant data will be collected.

Each state follows their own rules regarding hemp products. Be sure to consult your veterinarian on what product might be safely available, it is up to the veterinarians to know the current ruling of their State Veterinary Board.

Early Detection of Urothelial Carcinoma and Juvenile-Onset Nephropathy

By Claire Wiley, VMD, DACVIM, Clinician Investigator, North Carolina State University,
College of Veterinary Medicine, Raleigh, NC

Matthew Breen PhD CBIOL FRSB, Oscar J. Fletcher Distinguished Professor of Comparative Oncology Genetics

What Is Urothelial Carcinoma?

Urothelial carcinoma (UC), also referred to as transitional cell carcinoma (TCC), is a common cancer of the urinary tract that is both challenging to diagnose and treat effectively. This cancer represents 1-2% of all canine cancers, affecting 60,000-120,000 dogs per year. Westies in particular are 3-6x more likely to develop this cancer than the general dog population. In other words, 1 in 25 Westies aged 6 or older will develop UC/TCC. Typically, UC/TCC is not suspected until a dog develops clinical signs or urinary discomfort, such as bloody urine, straining to urinate, accidents in the house, and/or frequent urination. Diagnosis involves obtaining samples to identify the cancer as UC/TCC and to evaluate the location of any lesions. UC/TCC typically involves the bladder, urethra, and/or prostate. The current gold standard for UC/TCC diagnosis is via tissue biopsy, typically through cystoscopy. Abdominal imaging, such as ultrasound, and cystoscopy can be used to determine where the tumor is located. Distant metastases (spreading of UC/TCC to other organs such as lymph nodes, lungs, and the liver) are present in ~20% of dogs with UC/TCC at the time of diagnosis. Therefore, imaging such as abdominal ultrasound, thoracic radiographs, and/or CT scan can also be used to look for evidence of metastases. Once diagnosed, treatment options include chemotherapy, radiation therapy, and surgery. Currently,



at the time of diagnosis over 90% of cases of canine TCC/UC are of intermediate to high-grade and invasive. Due to its aggressive nature, UC/TCC treatment is rarely curative, and ultimately the tumor progresses. The ability to diagnose UC/TCC earlier in its disease course could have a powerful impact on blunting its progression.

The NC State College of Veterinary Medicine Urothelial Carcinoma Research Group is evaluating a newly developed test, the CADET® *BRAF*, to see if it is capable of early detection of urothelial carcinoma. Early, noninvasive diagnosis could be a game-changer in improving survival of dogs with UC/TCC. Additionally, we are investigating environmental exposure to chemicals, such as pesticides and flame retardants, in both dogs with early bladder cancer and healthy dogs.

What Is The CADET® *BRAF*?

The foundation for the CADET® *BRAF* comes from two recent studies performed by research teams at North Carolina State University (NC State) and the National Institutes of Health (NIH). A single mutation in the canine *BRAF* gene was detected in pathology-verified tumor biopsy specimens of canine UC/TCC. The result of this single mutation is one amino acid change (valine to glutamic acid) in the *BRAF* protein in the tumor cells. This change results in a mutated protein that signals the cells to proliferate, leading

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to the development of a tumor. The *BRAF* mutation has not been detected in numerous non-neoplastic bladder tissues, including inflammatory bladder tissue and polyps.

In cases where a dog has a UC/TCC, cells from the mass, ranging from very early to late in the course of disease, are shed into the urine and so contribute to the cells recovered. The Breen Lab at NC State developed a rapid and highly sensitive test to detect the presence of this mutation in cells shed into the urine. Further development by Sentinel Biomedical (www.SentinelBiomedical.com) led to the refinement and commercialization of the world's first liquid biopsy for a veterinary cancer in the form of the CADET® *BRAF*. Quantification is presented as a percent fractional abundance of mutant alleles. Most cells with the *BRAF* mutation are heterozygous, so the fractional abundance of the mutation typically does not exceed 50%.

The CADET® *BRAF* can identify 85% of canine UC/TCC. In all cases that have had a biopsy of a visible mass for pathology evaluation, there is 100% concordance between the presence of a *BRAF* mutation detected in free-catch urine and subsequent confirmation of a UC/TCC in the biopsy of the mass. In contrast, a *BRAF* mutation has not been detected in urine specimens from dogs that were shown not to have a TCC/UC. Unlike previous tests for canine TCC/UC, CADET® *BRAF* blood or bacteria in the urine does not affect results. The test can detect the *BRAF* mutation in as few as 10 cells shed into the urine, and therefore provides a powerful opportunity to use this mutation as a screening test to diagnose UC/TCC earlier. However, the CADET® *BRAF* has not been fully evaluated in asymptomatic dogs.

Screening Healthy Westies For UC/TCC

This clinical study at NC State, called the Early Detection of Urothelial Carcinoma Clinical Trial, involves screening healthy dogs over the age of 6 years from several AKC-registered breeds at an increased risk of developing UC/TCC. These breeds include West Highland White Terriers, Scottish Terriers, Beagles, Shetland Sheepdogs, Russell/Parson Russell Terriers, and American Eskimo dogs. As with all dogs affected by UC/TCC, the majority of tumors in the Westie are detected in the bladder.

Potential participants are asked to complete an online questionnaire and consent form. Upon completion, each dog owner will be sent a urine collection kit, which is very easy to use. Owners collect free catch urine from their dog at home in a clean household container and pour it into the collection pot provided. The pot is then shipped back to the lab to be tested.

All packing materials and prepaid FedEx shipping labels are included with each kit. On receipt at NC State Veterinary School, urine samples will be analyzed by CADET® *BRAF* to identify dogs that are shedding a very low level of *BRAF* mutant cells into their urine, indicative of the presence of an early TCC/UC. We

plan on screening over 1000 dogs across the country.

From the >1,000 dogs screened, 30 dogs with a low urinary *BRAF* mutation level will have a detailed clinical evaluation through physical examination, blood tests, urinalysis, ultrasound, cystoscopy, and biopsy of any visible lesions. The goal of the clinical evaluation is to obtain samples for definitive diagnosis and to determine the extent and location of any suspected UC/TCC. For all 30 dogs, the level of *BRAF* mutation shed into the urine will be monitored monthly. Once the levels reach 10%, dogs will have repeat diagnostics, including ultrasound, urine cytology, and cystoscopy with biopsy. The cost of all provided clinical evaluations and associated CADET® *BRAF* testing will be covered by the study. Participation will end when a definitive diagnosis of UC/TCC is made through urine cytology or histopathology of tumor biopsies.

If the CADET® *BRAF* is proven as an effective screening test for UC/TCC, earlier diagnosis prior to the development of clinical signs holds promise for improved survival and quality of life for dogs diagnosed with this devastating cancer. Through periodic monitoring, this study also aims to determine the time period from detection of a low level of the *BRAF* mutation to the time that the dog shows clinical signs of UC/TCC. This interval may help guide future recommendations on the frequency of screening as well.



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If you are interested in getting involved, please complete this questionnaire: <https://is.gd/NCStateUCClinicalTrial>

What Do We Recommend For Westies?

Although the study is ongoing, preliminary results suggests that screening asymptomatic dogs using the CADET® BRAF may aid in identifying UC/TCC 3-6 months or longer before clinical signs develop. Diagnosing UC/TCC earlier in the course of disease provides more time for the dog to be treated for this cancer. However, more studies are necessary to see if earlier treatment leads to increased survival. Starting at six years of age, we recommend using the CADET® BRAF to screen the urine of Westies every 4-6 months.

JUVENILE-ONSET NEPHROPATHY

What Is Juvenile-Onset Nephropathy?

Juvenile onset nephropathy, also known as renal dysplasia or juvenile dysplasia, represents a group of developmental anomalies defined as an abnormal differentiation of the



kidneys. Renal disease of any kind can be challenging to diagnose and treat early. Kidneys have incredible redundancy, and signs related to kidney disease do not develop until greater than 66% of both kidneys combined are damaged. Increased drinking (polydipsia) and urination (polyuria) develop once greater than 66% of the kidneys are damaged, and increased BUN and creatinine (azotemia) develop once greater than 75% of the kidneys are damaged. Other clinical signs related to kidney disease include vomiting, nausea, decrease appetite, weight loss, and muscle-wasting.

Juvenile-onset nephropathy often presents similar to chronic kidney disease, with these clinical signs gradually developing as kidney function declines. Therefore, juvenile-onset nephropathy can have a highly variable age of onset. **This late diagnosis means that dogs with juvenile-onset nephropathy could be bred before they show any clinical signs.**

Juvenile-onset nephropathy affects multiple breeds, including some terrier breeds related to Westies (Soft-coated Wheaten terriers, Cairn terriers). The disease is well characterized in some breeds, such as Lhasa Apso and Shih Tzu, and poorly characterized in others, often with only a single case or litter documented. Other breeds are likely affected.

How Is Juvenile-Onset Nephropathy Diagnosed And Treated?

Like many kidney diseases, juvenile-onset nephropathy is often diagnosed late in the disease course once clinical signs develop. Affected kidneys appear small and scarred, similar to those with advanced chronic kidney disease (CKD). Diagnosis is made with biopsy and histopathology. A large sample obtained through a surgical wedge biopsy is recommended. Because juvenile-onset nephropathy is a group of diseases, histopathology can be varied. The most consistent abnormality is inappropriate differentiation of nephron components, such as the presence of immature nephrons along with normal nephrons. Because the immature nephrons cannot function appropriately, the normal nephrons try to compensate and become hypertrophied. Histopathology may also show signs of acquired damage, such as inflammation, scarring, and mineralization. This acquired damage can make diagnosis of juvenile-onset nephropathy very challenging. If enough damage is present, then the immature nephrons or other diagnostic features may not be visible. **In other words, kidneys from a dog that died of juvenile-onset nephropathy could be identical to kidneys from a dog that died of CKD, even on histopathology.**

Although biopsies are imperative for diagnosis, ultrasound shows promise in identifying preclinical juvenile-onset nephropathy, and therefore aid in determining which dogs to obtain biopsies from. A study evaluating ultrasonographic findings in Cairn terriers showed that the severity of ultrasonographic disease observed was comparable to the

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severity of the histopathologic abnormalities, even in dogs as young as 4 months old. Kidneys with juvenile-onset nephropathy can look identical to those with other kidney diseases, so biopsy is always recommended. Treatment for juvenile-onset nephropathy involves supportive care, similar to that required for CKD. However, biopsy of the kidneys could identify a different type of kidney disease, and therefore necessitate different treatments.

What About Westies?

Although Westies have not been listed as an at-risk breed, the difficulty in diagnosing juvenile-onset nephropathy makes it very possible that other breeds, including Westies, are affected. Breeds related to Westies, including Cairns and soft-coated Wheaten terriers, also have reported cases of juvenile-onset nephropathy. More information is necessary to determine if this kidney disease should be a concern to breeders.

Moving forward, I recommend the club starts by discussing their goals in investigating juvenile-onset nephropathy. A starting point could be discussing the prevalence of kidney disease of any kind in Westies, because juvenile-onset nephropathy can appear similar to CKD. Once the scope of possible disease is established, the club can discuss additional recommendations. A starting point could be obtaining kidney samples from dogs that die of CKD. For consistency we recommend sending kidney samples to the International Veterinary Renal Pathology Service, a collaborative effort between the Ohio State University and Texas A&M University. Additionally, a database of all cases of juvenile-onset nephropathy could be established. Another consideration would be to start performing ultrasounds

on a few litters when the puppies are 4 months of age to see if any abnormalities are detected. Ultimately, no one is more dedicated to upholding the health of Westies than their breeders and owners, and so next steps should reflect a collaboration between the Westie club and veterinarians.

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New Research Identifies The Most Common Illnesses Suffered By Westies

Arlo Guthrie
VetSurgeon News
3 Sep 2019

The Royal Veterinary College has announced the results of the world's largest study of West Highland White Terriers¹, which identified both the most common illnesses suffered by the breed and the most common causes of death.



The *VetCompass* study, which was based on the records of over 900,000 Westies under the care of UK first opinion veterinary practices in 2016, also found that ownership of Westies has fallen dramatically, to just a quarter of what it was a decade ago. Researchers found that the breed comprised only 0.43% of puppies born in 2015 compared to 1.69% of puppies born in 2004.

The average age of the Westies studied was a relatively elderly 7.8 years, suggesting an ageing population with fewer new puppies entering the population compared to other breed studies carried out by *VetCompass*.

The most common illnesses suffered by Westies were found to be dental disease (which affects 15.7% of Westies), ear disease (10.6%), overgrown nails (7.2%), allergic skin disorder (6.5%) and obesity (6.1%). Lower respiratory tract disease and cancer were the most common causes of death, with each accounting for 10.2% of deaths in the breed. Spinal cord disorders were the next biggest killer at 7.8%.

Other Findings Included:

- Male Westies are more likely to be diagnosed with ear disease and aggression than female Westies.
- Female Westies are more likely, however, to develop dental disease.
- The average bodyweight of the Westie is 9.6kg, with males tending to be heavier with an average weight of 10.1kg compared to the 9.0kg average of females.
- The average lifespan of the breed is 13.4 years with males outliving females at 13.8 years compared to the latter's 12.9 years.

Dr Dan O'Neill, Senior Lecturer and *VetCompass* researcher at the RVC, who was the main author of the paper, said: "With the ascent of social media as a dominant influencer of public opinion, ownership preferences for dog breeds are becoming increasingly polarised and susceptible to the whims of internet celebrity endorsement and advertising.

"Previously, preferences for dog breeds used to wax and wane gently over time. But *VetCompass* breed data now show rapid changes in preferences among breeds that create bubbles and troughs of demand that can have far-reaching implications for these breeds.

"Flat-faced (brachycephalic) breeds are currently the darling of the nation but this has created huge welfare problems for breeds such as the Pug and French Bulldog. And breeds such as the West Highland White Terrier and Cavalier King Charles have fallen sharply out of favour."

Camilla Pegram, Veterinary Epidemiologist and *VetCompass* researcher at the RVC, who co-authored the paper, said: "The most common disorders of Westies shown in this study are also common in the wider UK dog population. However, the breed does seem

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predisposed to lower respiratory tract disease which was a common cause of death in the Westie. Owners should be aware of this as their Westie ages.

“What is particularly interesting is the level of skin disorders, which although relatively high, are still lower than might have been predicted a decade ago. It is possible that the reduction in Westie ownership has relieved the pressure on breeders to breed from less healthy individuals to meet demand and

therefore contributed to improved skin health within the breed. Paradoxically, reducing popularity may have led to better health in the Westies that are now being born.”

Reference

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Healthcare Tips For Senior Dogs

5 Tips to Keep Your Senior Dog Healthy

By Lorie Huston, DVM

PetMD https://m.petmd.com/dog/care/evr_multi_senior_pet_health_tips

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A senior dog has different health requirements than a younger dog. Here are some tips to help you keep your senior pet healthy.

1. DON'T FORGET THE HEALTH CHECK-UPS

Make sure your senior dog has regular visits with your veterinarian. In fact, many veterinarians recommend that senior dogs should be examined twice a year, even more so if the dog has serious health issues. A thorough physical examination by your veterinarian may reveal health issues that can impact your pet's life and comfort level, such as dental disease, arthritis, heart disease, kidney disease and more.

2. NOTE ANY BEHAVIOR CHANGES IN YOUR DOG

Watch your senior dog's behavior carefully. This is important for all pets but doubly so for senior dogs. Changes in your dog's behavior may be a symptom of disease. Watch specifically for changes in your dog's appetite and water consumption. Watch for changes in urinary and bowel habits and alterations in sleep routines. If your dog suddenly becomes irritable for no reason, it may be because he is in pain, having difficulty seeing, or having a hard time hearing properly. Any changes in your senior pet's routines or behaviors should prompt a consultation with your veterinarian.

3. MAKE IT EASIER FOR YOUR DOG TO GET AROUND

Be aware that your senior dog may have pain caused by arthritis or other health issues that make it difficult for him to get around

as well as he did when he was younger. Consider providing ramps or stairs to allow your senior dog to access furniture or beds. Ramps or stairs may make it easier for your pet to get up and down the stairs, and carpeting on slippery floors may help your dog gain his footing. Your senior dog may need assistance getting into and out of the car as well.

4. CHOOSE AN AGE-APPROPRIATE DIET FOR YOUR DOG

Dietary requirements may change as your dog ages. It's important that you provide your senior dog a pet food that is age appropriate. Some older pets tend to gain weight and may need a diet for less active dogs. Others may have difficulty holding their weight and may need a diet with a higher calorie content or better palatability. Older pets also may have diseases that can be manipulated and/or controlled at least partly through diet. Your veterinarian can help you choose an appropriate diet for your senior dog based on your dog's individual nutritional requirements.

5. PIMP OUT YOUR DOG'S BED

Provide soft blankets and towels for your senior dog's bed. This will help him to rest easier and sleep better. There are even special orthopedic beds made for senior dogs. In addition to having a denser form to help cushion your senior dog's aging joints, some orthopedic beds can be outfitted with a heat and/or vibration source, which increases circulation and reduces stiffness — perfect for dogs with arthritis.

What Is The Skin Barrier And Why Does It Matter?

By Valerie A. Fadok, DVM, PhD, Diplomate, ACVD
Senior Dermatologist, Zoetis

We are all aware that Westies are one of the breeds predisposed to atopic dermatitis, a chronic lifelong skin disease associated with itch and inflammation. Atopic dermatitis is a genetic disease with environmental triggers. Allergens include pollens, molds, dusts, danders, insects, and mites, but flares can be triggered by irritants (soaps, detergents), temperature changes (especially hot water), and even stress. Food allergy can be part of the disease, and affected dogs can become allergic to the staphylococcal and yeast organisms that frequently infect their skin. Affected dogs have a dysregulated immune system, which we have known for years. More recently, it has become clear that the skin itself is abnormal.

What Is The Skin Barrier?

The skin barrier consists of the very surface layer of skin cells, the corneocytes. In normal skin, these cells are arranged in an orderly fashion, and are surrounded

by lipids, consisting of ceramides, cholesterol, and fatty acids. We call this the “bricks and mortar” model. (See *Figure 1A*). One of the purposes of the skin barrier is to keep allergens and microbes out and hold water in. In atopic dermatitis, this skin barrier is disrupted. The skin becomes more porous and leaky, which allows allergens and microbes to penetrate more deeply into the skin, where they contact and activate the immune system (*Figure 1B*). When dogs have a skin barrier defect, their skin tends to be more scaly and dry than normal, which contributes to the itch. Skin barrier defects may be intrinsic in some atopic dogs, but any time a dog gets a skin infection with bacteria or yeast, the skin barrier is disrupted.

We know that there are many genes involved in the abnormal allergic response, and the same is true for the skin barrier. We are beginning to learn that different breeds have different sets of immune and skin genes affected.

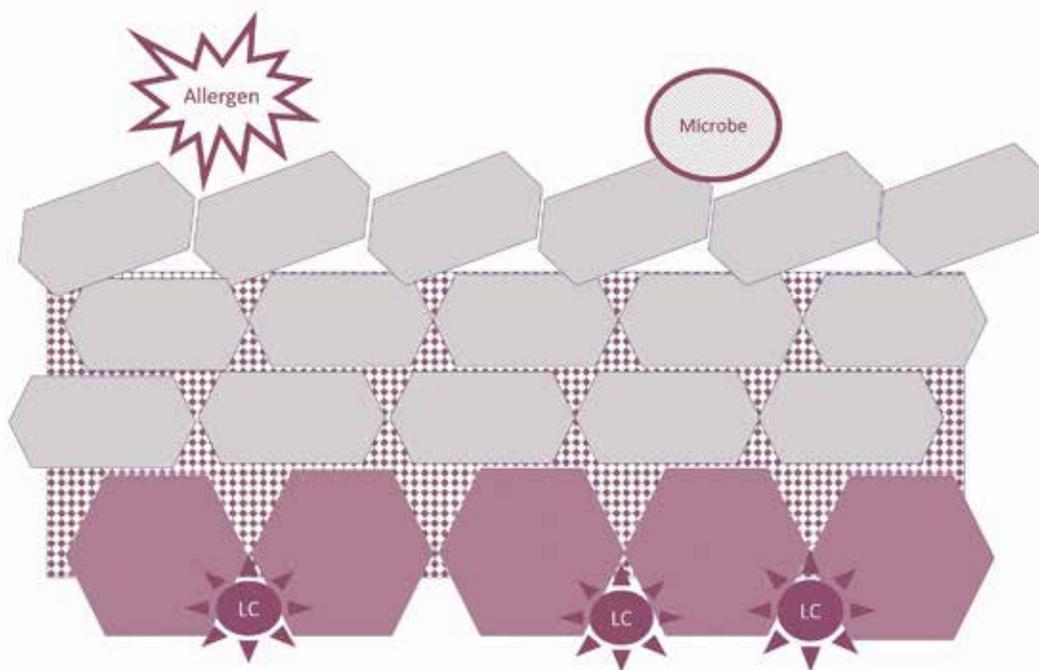


Figure 1A. Cartoon structure of the normal skin barrier. Grey shapes are cells of the barrier. Checkerboard represents the lipid. LC, Langerhans cells, the activators of the immune response.

(Continued on page 11)

(What is the Skin Barrier continued from page 10)

Hopefully in future, we can use this information to design better treatments for these dogs, but even now we can help the skin repair itself with good nutrition and with the application of lipids directly to the skin.

How Can We Repair It?

We have two ways to improve the function of the skin barrier: nutrition and topical therapy.

Nutrition: Diets enriched in the optimal ratio of omega-6 to omega-3 essential fatty acids as well as key nutrients (anti-oxidants, phytonutrients, vitamins, minerals, high quality protein) have been shown to improve the skin barrier and reduce the skin inflammation associated with atopic dermatitis. It is important to note that these diets are not meant to help diagnose a food allergy, but they are extremely helpful for atopic dogs. Examples include Hill's Derm Defense™, Royal Canin®'s Skin Support, and Purina Pro Plan Veterinary Diet® DRM. Many dogs have also done well with Hill's Prescription Diet® J/D® as well. Except for DRM which contains trout as its animal protein, these diets do contain chicken, and therefore would not be appropriate for a dog allergic to chicken. Each of these are high quality veterinary prescription diets and readily available with a prescription from your veterinarian. Utilizing these diets as part of your management plan can contribute greatly to the well being of your allergic dog.

Topical: There is good support for the beneficial effects of applying lipids directly to the skin. We have always advocated for washing dogs with a non-irritating shampoo, because it soothes the skin and removes allergens and microbes. When dogs have infected skin, there is nothing that will make them look better, feel better, and smell better than having a good antimicrobial bath in tepid to cool water! Now our veterinary shampoos contain lipids that have been proven to help the skin repair itself over time. These lipids include phytosphingosine, ceramides, and fatty acids; so far, we have no evidence to say that one of these is superior to the others. These lipids can be combined with other ingredients such as chlorhexidine and either miconazole or fluconazole to help battle infections. The beautiful thing about using these products is that while we recommend using them frequently initially, as time goes on, frequency can be reduced. And in addition to shampoos, we have sprays, mousses, wipes, and spot-ons, so there is a way to get topical lipid therapy to every patient who would benefit.

Phytosphingosine is actually a component of the skin and is a building block for ceramides, one of the major lipids in the skin. The most familiar brand for most of us is the DOUXO® line, originally produced by Sogeval and now by Ceva (<https://www.ceva.us/Companion-Animals/Dermatology>). There are several shampoos,

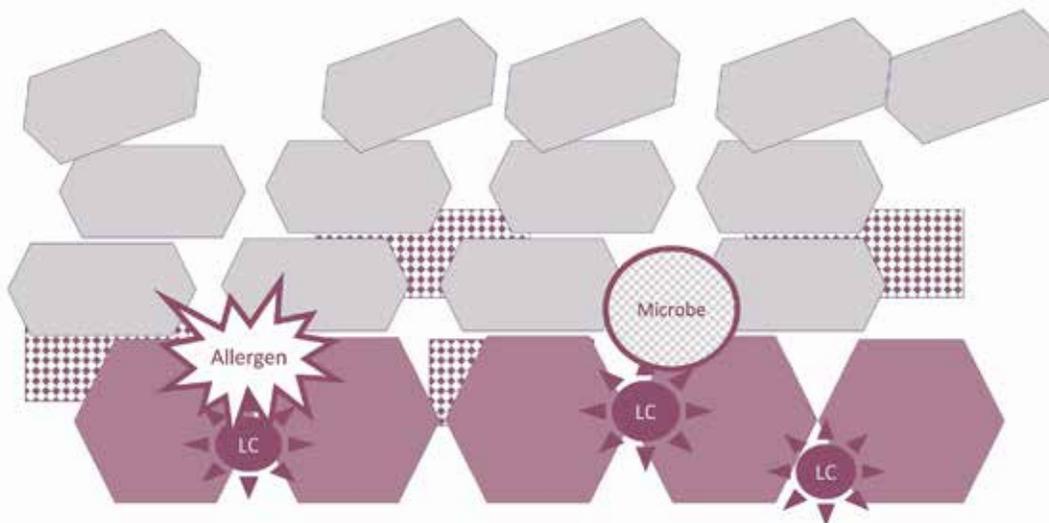


Figure 1B. Cartoon structure of a disrupted skin barrier. The lipids are disorganized and decreased; allergens and microbes can penetrate deeply to activate the Langerhans cells and start the abnormal allergic immune response.

(Continued on page 12)

(What is the Skin Barrier continued from page 11)

sprays, mousses, and wipes that contain phytosphingosine. Ceramides are contained in a number of products, including those made by Dechra (containing ceramide complex <https://www.dechra-us.com/therapy-areas/companion-animals/dermatology>) and Vetbiotek (ceramide III <https://www.vetbiotek.com/dermatology-products>). Again, there are shampoos, sprays, mousses, and wipes. Fatty acids are contained in HyLyt® shampoo (DVM brand, Bayer Animal Health <https://www.bayerdvm.com/products/hylyt-shampoo/?pref=all>) as well as in a number of products made by Dermoscent® Laboratoire (<http://www.dermoscent.com/en/>).



A Special Role For Spot-Ons

As we have said, bathing is one of the best things we can do for our dogs with atopic dermatitis. But there is a role for spot-ons and they are very easy to use. DOUXO® Spot-on is a pure solution of phytosphingosine which can be applied once to twice weekly initially, then as needed. It is odorless, clear, nongreasy, and can be used on cats as well as dogs. It seems to work best for local areas (e.g. ears, abdomen). More than one pipette may be needed for larger dogs.

Dermoscent® Laboratoire has two spot-ons, Dermoscent® Essential 6 and PYOspot®. These are a mix of highly refined essential oils of herbs and grains that have been shown to improve the skin barrier and rebalance the skin microbiome. There are different doses based on weight of the dogs. Dermoscent Essential 6 spot-on can be used once weekly for 4-8 weeks then as needed; coat skin quality can be improved dramatically. PYOspot is recommended for dogs who are struggling with recurrent pyoderma; work documenting its efficacy in reducing the number of pyoderma outbreaks will be presented at the World Congress Veterinary Dermatology in October, 2020.

Conclusions:

Barrier repair alone will not control all the signs of atopic dermatitis, but it can help speed recovery and reduce infections. When combined with an effective treatment to control itch and inflammation, it can greatly contribute to our atopic dogs' wellbeing.

The opinions expressed in the articles herein are those of the authors and not necessarily of the editor or the Officers or Directors of the Westie Foundation of America, Inc. (WFA). The WFA does not sell, endorse or promote products or services discussed in the newsletter.

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Lead, innovate and advance medical research to benefit the health and quality of life of West Highland White Terriers.

Lead, guide and advocate on behalf of Westies.

Develop and communicate to Westie owners, Westie breeders, veterinarians and others who share our challenges.

Journal Scan: Bad Dog? Pruritus May Be To Blame

2020-01-14 DVM360

<https://www.dvm360.com/view/urnal-scan-bad-dog-pruritus-may-be-to-blame>

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Findings From A Recent Study Show A Direct Link Between Itch Severity In Dogs With Atopic Dermatitis And Problem Behaviors.

Why They Did It

Inspired by studies in human medicine demonstrating a link between pruritic conditions and psychological distress that can lead to mental health issues such as depression and anxiety, researchers from the University of Nottingham's School of Veterinary Medicine in Leicestershire, United Kingdom, hypothesized that canine atopic dermatitis (AD) could have a similar effect on man's best friend. Specifically, they wanted to see if



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dogs with AD would display more problem behaviors that could be the result of the psychological stress brought on by their condition.

What They Did

Owners of purebred golden and Labrador retrievers were recruited to participate as part of the Itchy Dog Project, an online study designed to investigate the genetic and environmental causes of AD in these two breeds. Of the total 895 canine participants, 343 had been diagnosed with AD, and the other 552 healthy dogs served as controls. The pets' owners were blinded to the study's hypothesis and filled out questionnaires regarding their dog's skin health (including a measure of pruritus severity) and behavior.

What They Found

The researchers found a direct link between itch severity in dogs with AD and problem behaviors such as mounting, chewing, hyperactivity, coprophagia, begging for and stealing food, attention-seeking, excitability, excessive grooming and

reduced trainability. The results did not, however, show an association between pruritus and generally anxious or fearful behavior or aggression. Thus, the researchers conclude, "[the] results could indicate that the dogs diagnosed with AD may be experiencing low-level chronic stress as a result of pruritus."

Why It's Important

While the findings are significant to the welfare and treatment of dogs with AD, as with so many issues in veterinary medicine, the big picture includes pet owners. "Our study clearly showed a relationship between the occurrences of problematic behavior in dogs and chronic itching," said lead researcher Naomi Harvey, PhD, in a press release (<https://www.miragenews.com/itchy-skin-allergies-in-dogs-linked-to-problem-behaviour-says-new-study/>) about the research. "This can have a knock-on effect and impact the relationship between owner and dog, which means it's important for owners to know that their dog's behavioral problems could be due to the itching, rather than the dog themselves." Because as the study elaborates, "behavioral problems are the main reason given for relinquishing animals to shelters. Combined with the increased financial burden of treating and managing this chronic condition, and reduced quality of life reported by owners of dogs with AD, the problem behaviors shown by pruritic dogs in this study could disproportionately increase their risk of being relinquished by their owners."

Thus, the findings suggest that AD treatment should include client education aimed at reducing environmental stressors and protecting the human-animal bond. According to Dr. Harvey, this approach could also have an effect on the pruritus itself. "Given the large amount of evidence already available demonstrating the impact of stress in skin barrier function and the increased stress reported by human patients with AD, it is more than plausible that psychological stress experienced by dogs with AD could prolong and exacerbate allergic flares," she said in the release.

(Continued on page 18)

A Lifetime's Journey

CH PACH2 Kirkton's Moonlight at SilverOaks RE OA OAJ MXP14 MXPB2
MJP10 MJPC OFP PAX3 SWN SINE SCA RATO

By Mary Ann Neal

We are on borrowed time. I've known that since Maura turned 14, an age when my previous two Westies had departed this earthly plane and when most of my TEAM Westie callers over the years told me they had lost their beloved Westie. However at 15 years and 4 months my Maura continues to work and play with me. At the 2019 National Specialty she earned her RATO title in the one sport she truly only did because I asked her. She didn't particularly like Mr. Stinky. Ever. Not in Earthdog. Not in Barn Hunt. Her attitude? To throw shade at the location as if to say 'He's there. YOU deal with him.' Ask her to sniff out birch, anise or cypress and it's another game altogether. Even my stinky sock in Handler Discrimination is preferred to Mr. Stinky Rat!

Bred by Allison Platt, Maura was selected as my "everything Westie"...conformation and performance...we were in it for the long haul! Maura's performance career began young with basic obedience and rally obedience classes, but when she was climbing over my shoulders during class to see what was going on in the yard behind us where the big dogs were running agility, she indicated her game of choice. And once retired from

that game at 13, we took up AKC Scent Work as a way to keep her active and happy. Then we used the training from Scent Work to convince her to find Mr. Stinky. She earned all her scenting related titles, including her Barn Hunt Novice and Open after the age of 14. She would go on to become CH PACH2 Kirkton's Moonlight at SilverOaks RE OA OAJ MXP14 MXPB2 MJP10 MJPC OFP PAX3 SWN SINE SCA RATO, earn 3 trips to the National Agility Championships, and hold a top 5 position in Preferred Agility Westies for several years. And pending confirmation, in 2020 she will earn her WHWTCA Master of Versatility award.

Maintaining her health has been an important component in her achievements. She hasn't made it easy...swallowing a rock at 11 months which had to be surgically removed, a C-section for the big puppy who went the wrong direction during whelping, the repair of the sutures on that C-section when they popped. At 6 we spayed her. That's the point where we

moved her down to Preferred in Agility to jump 4 inches and her successes in that sport took off. Even before that I had had hips and patellas checked and OFA'd. With the help of my vet, Dr. Richard Yamaguchi, we ran titers



Maura Stacks for Mary Ann

(Continued on page 15)



Maura Jumps



Maura Weaves

for all her regular shots after the initial ones, administering only the Rabies, which is required by law, on the 4-year cycle.

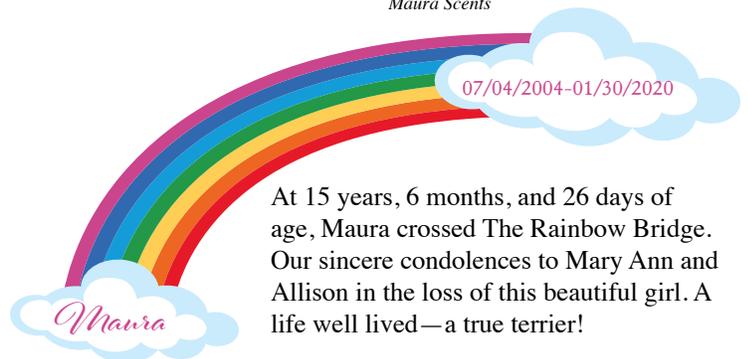
When she ate on a toxic plant that sent her liver into failure combined with Pancreatitis at 13, we treated her and changed her food to a low fat diet and brought everything back into the normal range. She had already been on a yearly senior blood panel to monitor changes. Then I found a hard bump near a nipple when she was 14. Dr. Yamaguchi removed a string of cancerous mammary tumors, achieving clean margins. A few weeks later she was back to work in Scent Work and earning titles there again, including a high Novice in Trial. She's maintaining her weight of 15 pounds, never misses a meal and plays with 6 year old Gibbs and the new addition, 16 week old Nuala. There are signs she's slowing down; her renal function isn't as good and I've been forced to cut back on the roasted chicken treat rewards she LOVES, her hearing is "selective" at times and she sleeps more soundly and startles if you wake her too quickly and she feels the aches and pains of active Westie Rumpuses with the pack. But she goes to Scent Work class weekly, tells the other dogs they aren't doing it right and continues to work, qualify and title when we trial.

Because of sound breeding, excellent veterinary care and a wide variety of activities, Maura continues to live her best life as my "everything Westie".



Maura Scents

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At 15 years, 6 months, and 26 days of age, Maura crossed The Rainbow Bridge. Our sincere condolences to Mary Ann and Allison in the loss of this beautiful girl. A life well lived—a true terrier!



RESEARCH PROGRESS REPORT SUMMARY

Grant 02309-T:

Targeting Cancer Epigenome Epigenome: The Effect of Specific Histone Lysine Methyltransferase Inhibition in Canine B-Cell Lymphoma

Principal Investigator:

Angela McCleary-Wheeler, DVM, PhD

Research Institution:

University of Missouri

Grant Amount:

\$21,321

Start Date: 09/1/2018

End Date: 06/30/2020

Progress Report:

Mid-Year 3

Report Due:

06/30/2019

Report Received:

10/01/2019

(The content of this report is not confidential and may be used in communications with your organization.)

Original Project Description:

Canine lymphoma is one of the most common cancers in dogs. While some breeds appear more at risk than others, all can be affected. Although it is often treatable, canine lymphoma can rarely be cured. A continued understanding of the mechanisms causing lymphoma in dogs and identification of novel therapies are needed to improve survival in dogs with lymphoma. One area of research that has been actively explored and provided exciting breakthroughs for human lymphoma is epigenetics, or alterations in how genes are turned on and off independent of the DNA sequence. One way in which this occurs is due to modifications of the proteins that interact with DNA called histones. Various modifications to these histones can result in genes being turned on or off, leading to the development of cancer. One particular enzyme that modifies histones, EZH2, has been found to play a role in some human lymphomas. However, this has been unexplored in canine lymphoma. Given the striking similarities between human and canine lymphoma, the objective of this work is to characterize the function and role of EZH2 in canine lymphoma. The investigators will utilize an EZH2 inhibitor to study EZH2 in canine lymphoma cells. The information obtained from this study will help guide the future development of this targeted inhibitor for use as a novel therapy to treat canine lymphoma.

Publications: None at this time.

Presentations: The work was presented as a poster presentation at the Veterinary Cancer Society Annual Conference in October 2017.

Report to Grant Sponsor from Investigator:

Lymphoma, particularly the large, B-cell subtype, is one of the most common malignancies in dogs. Canine lymphoma can be treated, but it is rarely cured. Novel therapeutic strategies are necessary to improve outcomes in dogs diagnosed with lymphoma. Recently, advances in the understanding of human lymphomas have focused on the area of epigenetics. One area of this research involves understanding how genes are turned on or off based on different modifications to histone proteins, a specific group of proteins that interact with DNA. Specific enzymes that modify these histone proteins have altered activity that can lead to lymphoma development in human lymphomas. One of these enzymes is EZH2. Increased activity of EZH2 has been shown to play an important role in the development of some human lymphomas. Data from a Phase I study of an EZH2 inhibitor, tazemetostat, in relapsed or refractory human B-cell, non-Hodgkin lymphoma has shown to be a safe, oral therapy with potential clinical benefit. The role of EZH2, however, has not been evaluated in canine B-cell lymphomas to date. Given the similarity between human and canine B-cell lymphoma, we seek to investigate whether EZH2 activity plays a role in canine B-cell lymphoma. To do this, we use canine lymphoma cells and specific EZH2 inhibitors, including the tazemetostat used in early human studies, to evaluate the effect of EZH2 inhibition on cell growth and survival. Our data suggest

that this inhibitor is highly potent and effective for inhibiting EZH2 effects on histone modification in canine lymphoma. This is important as this inhibitor is an orally bioavailable drug with a good toxicity profile in humans, making this inhibitor a candidate for clinical trials in dogs with lymphoma. Initial data suggests that EZH2 inhibition may not impede lymphoma cell proliferation or survival. However, we have confirmed that some genes that regulate the ability of canine lymphoma cells to replicate are altered with EZH2 inhibition. Specifically, one gene, CDKN1a, is turned back on when EZH2 is inhibited. The activation of CDKN1a is repeatable and profound. We will be continuing this work with a sequencing approach to further understand what genes are regulated by EZH2 in canine B-cell lymphoma cells. Our findings are suggesting an importance for EZH2 in canine lymphoma and for continued investigations into cell cycle regulators that may be abnormal. By understanding the genes regulated by EZH2, we can characterize the role this histone modifying enzyme has in canine lymphoma. Moreover, we can assess how inhibition of EZH2 activity may be utilized clinical in dogs with lymphoma. We appreciate the continued generous support provided by this grant from the CHF and its supporting donors.

RESEARCH PROGRESS REPORT SUMMARY

Grant 02597:

Molecular Epidemiology of Methicillin-resistant Staphylococcus pseudintermedius in the United States

Principal Investigator:

Stephen Kania, PhD

Research Institution:

University of Tennessee

Grant Amount:

\$47,082.00

Start Date: 05/1/2019

End Date: 04/30/2021

Progress Report:

Mid-Year 1

Report Due:

10/31/2019

Report Received:

10/23/2019

(The content of this report is not confidential and may be used in communications with your organization.)

Original Project Description:

The bacterium *Staphylococcus pseudintermedius* is the most common cause of canine skin infections as well as other important canine diseases. Disfigurement caused by skin infections and treatment failures is an important problem. Resistance to antibiotics is becoming increasingly widespread with few or no antibiotic options left for some cases. Alternative therapeutic approaches being investigated include vaccines, small molecule virulence factor inhibitors and bacteriophage lytic enzymes. In order for new products to be effective against the broadest spectrum of wildtype bacterial strains as possible, it is important to determine which strains of *S. pseudintermedius* clinically predominate in the United States today. A genetic typing method for *S. pseudintermedius* was previously developed by the research team along with a survey of bacterial strains in the United States in which they sequenced the genomes of the most common strains. This analysis provided a snapshot of predominant strains and suggested a potential for emergence of new, highly antibiotic resistant organisms. Identifying the current strains in the US and sequencing their genomes will provide a basis for developing the next generation of treatments as well as important information about changes that occur in the bacterial population in response to selective pressures.

Publications: None at this time.

Presentations: None at this time.

Report to Grant Sponsor from Investigator:

This project is designed to study the molecular epidemiology and characteristics of *Staphylococcus pseudintermedius* in the United States. This bacterium is the major cause of skin infections in dogs and has become widely resistant to antibiotics over the past 15 years. With data from about one-third of the samples we plan to collect, we have found widespread antibiotic resistance and emergence of new strains previously only associated with canine disease in other parts of the world. This information is important to understand the spread of antibiotic resistance and for the development of new strategies to treat and prevent this important disease.





RESEARCH PROGRESS REPORT SUMMARY

Grant 02651:

Discovery of Novel Biomarkers of Canine Atopic Dermatitis through Lipid Profiling

Principal Investigator:

Harm HogenEsch, DVM, PhD

Research Institution:

Purdue University

Grant Amount:

\$99,105

Start Date: 05/01/2019

End Date: 10/31/2020

Progress Report:

Mid-Year 1

Report Due:

10/31/2019

Report Received:

10/28/2019

(The content of this report is not confidential and may be used in communications with your organization.)

Original Project Description:

Canine atopic dermatitis (CAD) is a common allergic skin disease of dogs with a strong genetic basis. CAD can severely affect the health and well-being of dogs and current diagnosis of CAD requires time-consuming and expensive procedures for the owner. Furthermore, the molecular mechanisms underlying this condition are not well understood. Evidence from human studies suggests that several variants of atopic dermatitis (AD) exist with different mechanisms and responses to treatment. Therefore, new approaches to identify molecular markers that can help with better diagnosis and management are warranted. CAD and human AD are associated with changes in the composition of lipids in the epidermis which may precede the inflammation or result from the inflammation. The investigators will analyze the lipid composition of the epidermis and blood of healthy dogs in comparison to dogs with CAD using a novel analytical method developed by their interdisciplinary team. The results of this work could lead to new, minimally-invasive tests for the diagnosis of CAD and for the prediction and monitoring of the response of CAD patients to treatment.

Publications: None at this time.

Presentations: None at this time.

Report to Grant Sponsor from Investigator:

Canine atopic dermatitis (CAD) is a common allergic skin disease of dogs with a strong genetic basis. Evidence from human studies suggests that several variants of AD exist with different mechanisms and responses to treatment. Current diagnosis of CAD requires time-consuming procedures that involve a considerable cost to the owner. Therefore, new approaches to identify molecular markers that can help with better diagnosis and management of the disease are warranted. In this study, we are using our tailored methodology for lipid biomarker discovery in CAD. Thus far, 19 atopic dogs and 13 healthy dogs have been recruited. Patients are males and females of several different breeds and ages with seasonal or year-round itch. CAD patients enrolled so far are being treated with either Apoquel[®], Cytopoint[®] or prednisone and followed for 2 months to evaluate the lipid changes in their skin and blood. Using non-invasive sampling procedures, we have collected samples from the skin of healthy controls and from affected and non-affected areas of the skin of CAD patients. Preliminary statistical analysis demonstrates that the lipid fingerprint of the skin accurately classifies samples from healthy dogs and CAD patients, and can distinguish between affected and non-affected skin of CAD patients. MRM-profiling approach allows an unbiased analysis of the lipids that may result in new diagnostic biomarkers to classify disease phenotypes that drive the development of new therapies.

(Journal Scan continued from page 13)

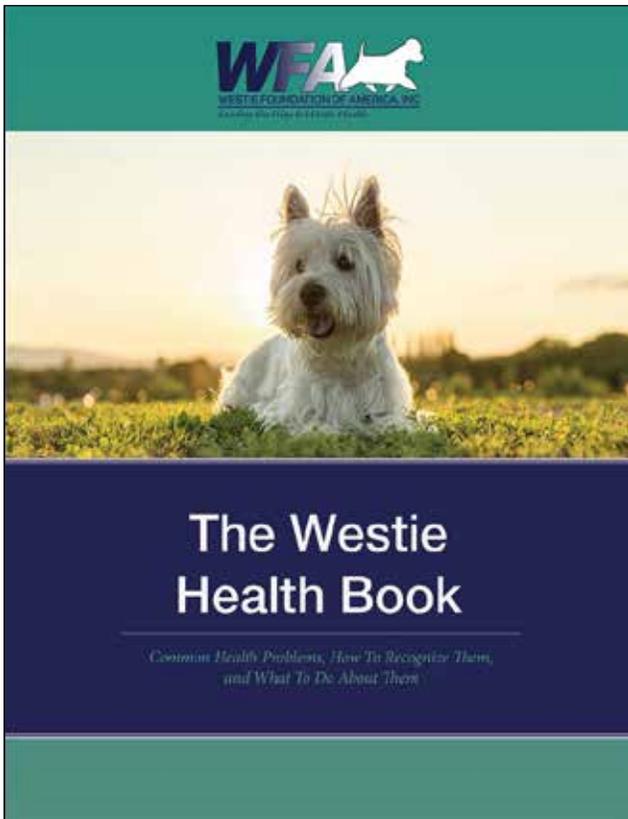
What's Next

Association is not causation, so more research is needed to determine whether pruritus causes stress in dogs with AD or if other factors are to blame. As the researchers conclude, "Given the potential importance of stress in AD development and the implications of the behavioral problems we have found for dog and owner bonds, further studies need to be carried out."

To read the full study, <https://www.mdpi.com/2076-2615/9/10/813/htm#B10-animals-09-00813>

Harvey ND, Craigon PJ, Shaw SC, et al. Behavioural differences in dogs with atopic dermatitis suggest stress could be a significant problem associated with chronic pruritus. *Animals* 2019;9(10):813.

Sarah Mouton Dowdy, a former associate content specialist for dvm360.com, is a freelance writer and editor in Kansas City, Missouri.



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Westie Cartoon Caption Contest

Create the winning caption for this Westie cartoon. Please send your caption to bjpinter@msn.com before April 1, 2020. The winner and runner-up will be announced in the next newsletter with their captions.

Create a Caption for this Cartoon

Copy of original watercolour by Ruth Sutcliffe, England



Winning Caption of Last Cartoon! Martha Black



“First Responders Saving Westie Family From Gator Invasion.”



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