Westie NEWS
Foundation of America Inc.
Fall Issue 2008
Working for Westie health through research and communication

IN THIS ISSUE

The Westie Foundation of America, Inc. is a nonprofit corporation, recognized by the IRS as a 501 (C) (3) organization. The mission of the Foundation is to provide financial aid and other support for medical research in order to benefit the health and quality of life of West Highland White Terriers; and to further develop and communicate information regarding the health, care, breeding and quality of life of Westies to Westie owners, Westie breeders and veterinarians.

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PRESIDENT'S MESSAGE

It was a significant disappointment to have to cancel the Westie Foundation health seminar at Montgomery at the last minute. Unfortunately, one of our two speakers, Dr. Keith Murphy, fell on his way over to the seminar from the hotel and aggravated a back condition that left him in severe pain, and he had to be rushed to a hospital by the other speaker, Dr. Alison Starr. Fortunately, Dr. Murphy was in good condition after being treated at the hospital and released late that evening. I trust we will have Drs. Murphy and Starr back to address Genetics of the Dog and Rear Leg Lameness at one of our future seminars. In the meantime, Dr. Starr has provided us with an excellent summary of her presentation, and it's included in this issue, along with a call for more DNA samples from Westies affected with Legg-Calve-Perthes Disease.

We have just put the latest four chapters of our Health eBook up on our website (www.westiefoundation.org) - Breeding and Whelping, Juvenile Cataracts, Aggression and White Shaker Syndrome. These chapters join eight other chapters on diseases affecting Westies, and we will be contracting with the Virginia/Maryland Regional College of Veterinary Medicine to develop four more chapters for delivery in the second half of 2009. By the end of next year, we will have an up-to-date eBook with sixteen chapters and 150 - 200 pages of information addressing diseases and health issues affecting Westies. I honestly believe that this effort is truly unique in the area of breed-specific health information, and represents one of the greatest successes of the Westie Foundation.

On another note, our researchers are still urgently requesting DNA samples for Westies affected with Transitional Cell Carcinoma (bladder cancer) and Legg-Calve-Perthes Disease. If you have or know of any Westies affected with either of these diseases, please

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visit our website, which has links to information about how to have a vet collect these samples and who and where to send them. Also, the next time you happen to be visiting your vet, you might mention this request to them, in case they may have other Westie clients with these diseases. Again, all information about the affected dog and owner is strictly confidential, and known only to the participating vet and the researchers.

Speaking of treating Westies, I again encourage you to nominate your vet for our Westie Docs program, assuming you are happy with your vet and would recommend her or him to your fellow Westie owners. This information can be very helpful to first-time or recently relocated Westie owners. It also helps us to reach vets who may have Westie clients with a specific disease when there are needs for DNA samples or cases for research projects we are funding. Please note that we have made the nominating process much easier for you. All you have to do is fill out your vet's name and address on an on-line form on our website, and we will take care of getting the vet's other contact information and permission to have their name appear on our Westie Docs list.

Finally, congratulations to the winners of our two raffles at Montgomery - Cheryl Stinson of Kentucky for Westie Docs Nominators and Gail Miller of Louisiana for the trip to the Eukanuba Championship Show in Long Beach, CA this year.

Thanks again for your generosity and support.

Wayne Kompare

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FUNDRAISING COMMITTEE

By Bebe Pinter

"He is your friend, your partner,
your defender, your dog.

You are his life, his love, his leader.

He will be yours, faithful and true,
to the last beat of his heart.

You owe it to him to be worthy
of such devotion."

Unknown

In your mind, substitute "Westie" for "dog" in the first sentence of the quotation above. I think we agree that Westies are very important to each of us, especially, our own westies.

In this regard, we are fortunate that the founders of the Westie Foundation of America Inc. had the foresight to create a non-profit organization benefiting the health and wellbeing of all Westies. Most importantly, the organization provides a coordinated, efficient method for us to join forces through contributions of time and money to achieve what we could not accomplish if acting alone.

Your donations make it possible for the Foundation to formally attack, through research, numerous diseases that threaten Westies, to develop 12 chapters for Health eBooks, to maintain a website for information and communication, to provide annual seminars on "hot" health topics, to publish a quarterly newsletter, to provide education to owners and breeders, to liaison and team with other health and education focused canine organizations, and to respond to Westie owners' questions and concerns.

To continue these projects and other work benefiting all Westies, the Foundation requests your ongoing support. Please think of us for memorials and honorariums, as beneficiaries, as the designated recipient of funds raised from a Westie Walk or other club activity, and by supporting our annual fundraising activities. For example, one upcoming activity is a raffle for a trip to the 2010 Westminster as the prize. There will also be ample opportunities throughout 2009 to purchase gifts and treasures available online and at national club activities. As a reminder, December 31 is the last date to make a charitable contribution eligible for deduction on your 2008 income tax.

We thank you for your generosity as it demonstrates your love and care for all Westies.

HEALTH COMMITTEE UPDATE

By Kay McGuire, DVM, MS

I continue to answer and field numerous questions from our web site www.westiefoundation.org. Upon reviewing the saved messages, 60% are concerning Westies with skin disease. Aggression, dry eye (KCS), Cushings Disease and Addison's disease each occur about 15%. The remaining questions fall under copper toxicosis or liver disease, acute death, diet, behavior, and luxating patellas. We are all aware that our wonderful breed suffers from many genetic problems, but no more than other breeds. Being the guardian of your dog's health should encourage you to look for as many of the genetic problems as possible in your future breeding prospects. The West Highland Club of America's Board of Directors also encourages breeders to participate in the Canine Health Information Center's registry.

Information on hip and patella registries can be found on www.offa.org. Highlight OFA forms, the forms can then be downloaded and printed to take with you to your veterinarian. The dog must be permanently identified by microchip or tattoo, taken to your veterinarian and a ventrodorsal hip radiograph taken as per specifications on the OFA application. The dog must be at least two years of age for certification. The film and application are submitted to OFA with the appropriate fee. Once the film is "passed," an OFA number will be issued to the dog. This information is automatically reported to the Canine Health Information Center. Patella clearances may be certified by your veterinarian with just a physical examination. Again, this form filled out by the veterinarian is submitted to OFA for a patella registration. The dog's eyes may be cleared upon examination by a Board Certified Opthomologist. Exams are to be repeated yearly to assure good eye health. All these registries automatically report to CHIC. Once the three tests are performed, your dog will be issued a CHIC registration number.

HEALTH E-BOOKS

Please check out the Foundations web site to see our new e-book articles. We are proud to launch chapters on Canine Breeding and Perinatal Care, White Shakers Disease Syndrome, Juvenile Cataracts, and Aggression. The subjects of choice for next year include Diabetes mellitus, Keratitis Sicca (Dry Eye), Copper Toxicosis and Cholangiohepatitis, and Alternative Medicine. We offer a special thank you to Dr. John Robertson from Virginia Tech University for orchestrating the production of this information.

MONTGOMERY COUNTY HEALTH SEMINAR

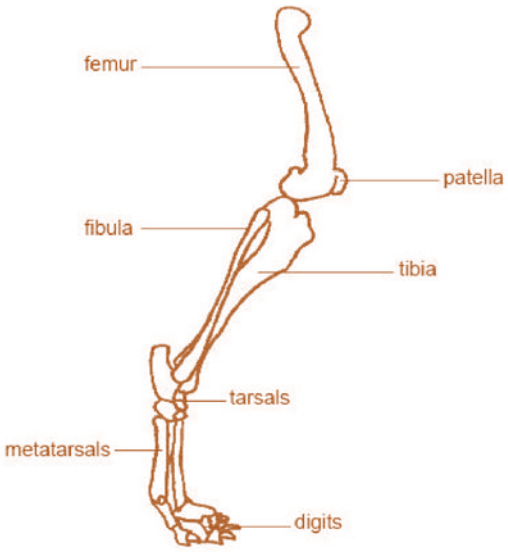
As many of you are aware, our health seminar at this past Montgomery County weekend was postponed due to a freak accident to our speaker Dr. Keith Murphy. We are glad to add that Dr. Murphy has recovered nicely. In this edition of our newsletter and on our website, please find the summation of the presentation by Dr. Alison Starr.
Rear Leg Lameness: a Genetic Perspective.

REAR LEG LAMENESS: A Genetic Perspective

Alison N. Starr, Ph.D.
Canine Genetics Laboratory, Clemson University, Clemson, SC 29634

Introduction

Three major orthopedic conditions affecting the rear leg in West Highland White Terriers include patellar luxation, hip dysplasia, and Legg-Calve-Perthes. Each will be briefly discussed in terms of description of the condition, treatment options, and what is known from a genetic standpoint.



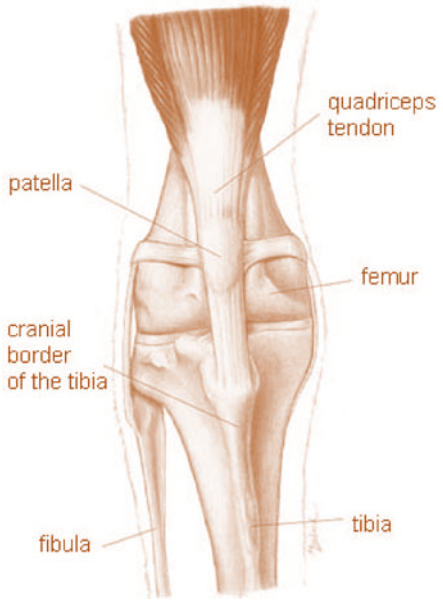
As a review, let us start with some basic anatomical points of reference that will be discussed throughout the article. The normal rear leg of the dog has 3 main joints: the hip, the stifle, and the hock. The bones comprising the rear leg are, from the top down: femur (long bone between the hip and stifle), patella (kneecap), tibia and fibula (bones between stifle and hock), tarsals (bones in the hock, equivalent to our ankle bones), metatarsals (bones between hock and foot, equivalent to the bones in the flat of our feet), and phalanges/digits (the bones in the toes). The patella (kneecap) is maintained in proper position by the quadriceps and patellar tendons. The hip and stifle joints, and associated structures, will be the focus of this article.

Patellar Luxation

Patellar luxation is a dislocation of the kneecap. This is one of the most common congenital anomalies in dogs. Nearly 7% of all puppies are diagnosed with a luxating patella. Small breed dogs are 10 times more likely to be affected than large breed dogs. Half of the diagnosed cases have a bilateral (both stifles) involvement.

The patella can luxate (move out of place) either medially (towards the belly) or laterally (towards the outside of the leg). Medial luxations are more common than lateral conditions.

Signs that your pet may have patellar luxation include: carrying leg off the ground for several steps, shaking or extending the leg prior to full use, or intermittent rear leg lameness. Severe cases may present with a "bow-legged" appearance. This is due to an improper development of the leg(s) as a result of the luxation.



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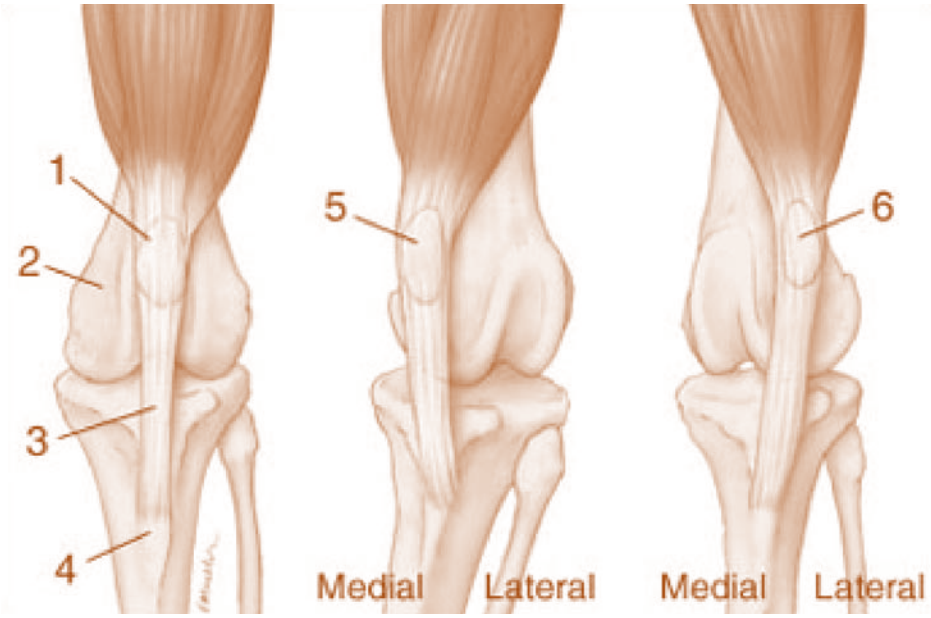


1- Patella	4- Tibia
2- Femur	5- Medial luxation
3- Patellar ligament	6- Lateral luxation

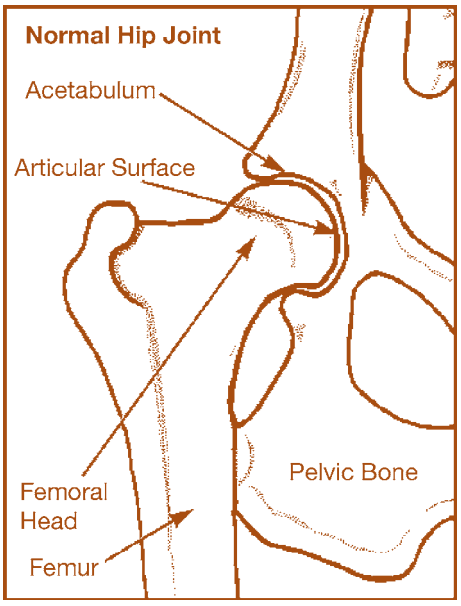
There are four grades used in the evaluation of the severity of a luxation. Grade 1 luxations mean the patella can be manipulated out of its groove, but returns to the normal position spontaneously. Grade 2-4 luxations indicate that the patella spontaneously rides out of its groove and may or may not be able to be replaced in proper position. The higher the grade, the more time the patella resides outside of grove. Owners with dogs having a grade 2-4 may need to consider surgical treatment.

Surgical corrections aim to reconstruct the stifle joint for proper alignment and congruency of the quadriceps, femur, patella, tendons, and tibia/fibula.

Breed predispositions have been observed, indicating there is a genetic link to this condition. The Westie was one of 32 breeds identified as having an increased risk for developing patellar luxation by Drs. LaFond, Breur, and Austin. One recent study investigating patellar luxation in flat-coated retrievers suggested an autosomal recessive transmission. This was proposed by Dr. Herman Hazewinkel at Utrecht University. If luxating patellas are determined to be a recessive condition, this is good news for eliminating the condition from breeding lines. With proper use of a genetic test, autosomal recessive conditions can be eliminated from breeding lines in two to three generations. This, of course, requires a genetic test, which is currently unavailable.

Hip Dysplasia

Canine Hip Dysplasia (CHD) is the most common orthopedic disease of the dog. CHD is a degenerative disease characterized by an improper formation of the hip joint. Changes in hip joint laxity and conformation begin in the first few weeks after birth. CHD inevitably leads to osteoarthritis (OA), also known as degenerative joint disease (DJD). This is the result of



the femoral head having mobility in the socket, causing it to contact the edge of the acetabulum.

Clinical signs of CHD include painful hips between the ages of 6-8 months; lameness, particularly after exercise or prolonged confinement; reluctance to run, play or jump; tiring easily; exhibition of a "bunny-hop" gait; a loss of muscle mass in rear legs; a "popping" sensation felt over the hips.

The only definitive method for diagnosing CHD is the observation of arthritis in the hip joint. Unfortunately, this means that the hip joint must undergo painful structural changes before detection is possible.

Normal hips shown on left, dysplastic hips on right. Notice the dislocation of the right hip (left hip as you view picture). Femoral head is not seated properly in the acetabulum. You do not observe the typical ball-in-socket joint congruency.

There are several methods of evaluating the hip joints, which you can discuss with your veterinarian. Each method has associated pros and cons. These methods include (but are not limited to): ventrodorsal hip extended view (VHE), University of Pennsylvania Hip Improvement Program (PennHIP) method (illustrated in images to left), and dorsolateral subluxation (DLS) test.

There are many courses of treatment to consider in a dog afflicted with CHD. These options should be discussed with your veterinarian as to which would be most suitable for you and your dog's needs.

CHD is a complex trait. There are numerous laboratories researching CHD and several

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regions of interest have been identified. Nutrition is also known to play a role in disease development. To date, no specific genes have been implicated from these studies and no mutations have been described in CHD-affected dogs.

Due to the multifactorial nature of this condition (genetics + environment), CHD has been very challenging to selectively breed away from. General recommendations for breeding programs trying to eliminate CHD from their lines include:

- Breed the best to the best
- Breed for the whole dog, not just for a single trait
- Keep detailed breeding records, including testing (OFA hips/patellas, etc.)
- Dysplastic dogs are not recommended for breeding

Legg-Calve-Perthes Disease

Legg-Calve-Perthes Disease (LCPD) is a form of osteonecrosis of the hip. LCPD is a disease of many names: ischemic necrosis of the hip, coxa plana, osteochondritis, avascular necrosis of the femoral head, and Perthes Disease. LCPD affects puppies, generally between the ages of 4 and 11 months, and is limited to toy and miniature breeds. This disease can affect one or both hips (unilateral or bilateral).

Clinical signs of LCPD include a sudden onset of non-weight bearing lameness without previous trauma, pain in the hip, muscle atrophy, and crepitus (crackling or grating feeling in joint) of the hip during palpation. Some cases of LCPD are subclinical, meaning they show no outward clinical signs.

Diagnosis of LCPD is typically made by evaluation of radiographs (x-rays) or magnetic resonance imaging (MRI). These visualization techniques are coupled with palpation of the hip and the evaluation of range of motion and observance of clinical signs in the patient. In the image to the right, notice that the right femoral head (left as viewed) is misshaped, has planar angles, and has a widened joint space as compared to the left.

LCPD has an unknown etiology, meaning we do not know what initiates the disease. Infection, trauma, metabolic or hormone imbalances, vascular abnormalities, and genetics have all been proposed origins of the disease.

Several treatment options are available for cases of LCPD. The goal of treatment is to (1) reduce hip irritability, (2) restore and maintain hip mobility, (3) prevent the femoral head from collapsing, and (4) regain proper spherical femoral head conformation. This can be accomplished in a manner of ways:

- **Conservative** – The primary objective in conservative treatment is to reduce the motion in the hip joint. This requires rest and limited exercise, crate rest, controlled walks on a

leash, and no vigorous play. Pain medicine and anti-inflammatory medication are given as needed.

- **Femoral Head Ostectomy (FHO) –** This surgical procedure involves the excision of the femoral head and neck. Over time, a false joint of muscle and tissue will form.
- **Total Hip Replacement (THR) –** This procedure is newly available for small breeds. Here, diseased bone is removed and replaced with an artificial joint. BioMedtrix is the sole provider of hip replacement for small breed dogs. (For more information, see BioMedtrix.com; search CFX ™ Micro Hip System)

Our lab has started a research project studying LCPD in several breeds of dog, including the Westie. We have collected 24 samples in total for the project: 14 affected and 8 unaffected samples. Of those, 7 affected and 6 unaffected samples are from Westies. We are asking for a small volume of blood from each participating dog, a copy of the pedigree, and a copy of radiographs used to diagnose LCPD affected dogs.

One of our aims is to identify the mode of inheritance of LCPD in several breeds. There are reports of an autosomal recessive inheritance with incomplete penetrance (meaning not all dogs who have the disease alleles develop the disease) as well as a multifactorial inheritance, meaning there would be major and minor genes in addition to environmental factors which contribute to the disease. We are collecting pedigrees with each sample submitted to complete transmission studies of LCPD and identify the mode of inheritance in Westies. Our initial analyses using only a few pedigrees were inconclusive – we did not have enough affected dogs to draw any conclusions about inheritance. We are continuing to collect pedigrees to complete this aim.

Our second goal is to identify candidate genes that may either cause the disease or be involved in the disease process. Our planned approach for the study of LCPD is a whole-genome association mapping strategy, where we examine molecular markers (think: genetic mile markers) that will identify regions of interest, or regions where all the affected dogs have the same markers in a unique pattern from the unaffected dogs.

Our ultimate goal from this work is to identify the mutation causing LCPD. This would allow us to develop a genetic test that would enable early classification of affected dogs as well as detection of carrier dogs. Breeders would then be able to make informed decisions in their breeding programs and eliminate LCPD from their breeding lines. Any owners with questions regarding this study or willing to participate in the study should contact Dr. Alison Starr (astarr@clemson.edu) or refer to the Westie Foundation of America website for more information.

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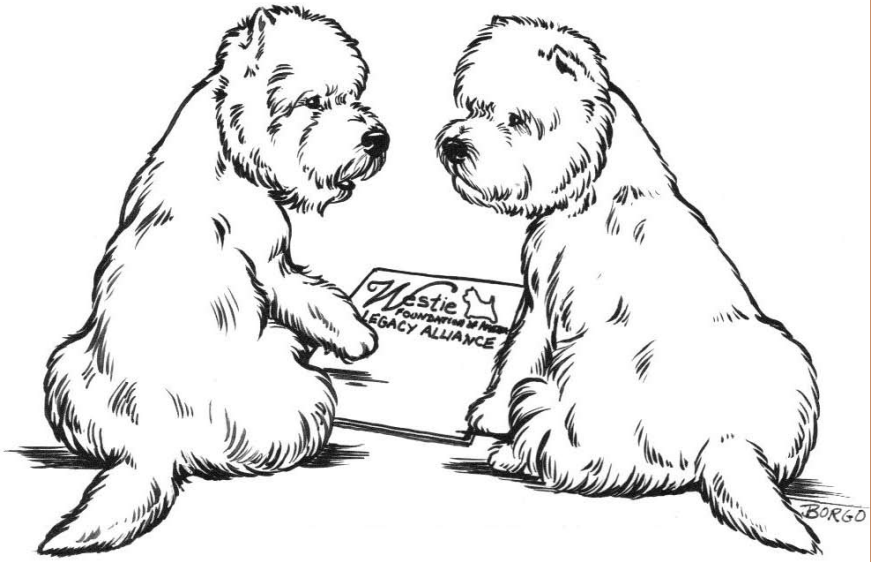

Did you hear?

The Westie Foundation of America has an endowment fund. It's the **Legacy Alliance Program**. All gifts and bequests stay in the Fund. All earnings from the Fund are used to help Westies through research and education.

Contact us:
www.westiefoundation.org/contact

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