

The benefits (aside from preventing pet overpopulation) of neutering male dogs may be a reduction in the incidence and growth of some types of skin tumors (“perianal gland adenoma”), decreased incidence of perianal fistula and problems associated with benign enlargement of the canine prostate, including prostatic cysts and abscesses. The results of recent research has not shown that neutering of male dogs decreases prostatic cancer in dogs; in fact, some findings indicate that neutered male dogs may be at a slightly increased risk for developing this very uncommon tumor.

The effect of spaying and neutering on the development of other diseases and on pet behavior (such as aggression) is less clear cut. Once again, a discussion of these topics with your veterinarian will help you make important decisions on pet breeding and pet neutering.

How Breed Influences Health in Dogs

One of the many things that are very important in determining the health of every dog is genetic makeup. Each cell in every dog contains a “blueprint” for the cell and for the dog. These “blueprints” are made up of DNA, formed into specific genes contained in chromosomes. The entire set of genes that contain the “blueprint” for each dog is known as its genome. The genome specifies how cells are made, how the cells form tissues, and how the tissues (such as the heart or skin) function.

Selective breeding of dogs, following domestication from wild dogs and wolves, has resulted in the evolution of specific dog breeds, like the West Highland White Terrier. The genome of one Westie is likely to be very similar to other Westies, because selective breeding over several hundreds of years has focused the genome on certain desirable characteristics that make them Westies. For example, the pale and white coat color of Westies, the shape of the body, and even things like their

lifespan are encoded in their genome. Interesting, Westies tend to live longer than Great Danes!

It is very likely that the differences between the genome of Westies and those of other dog breeds are small and caused by the variable expression of certain key genes. These variations in gene expression are termed “polymorphisms” or “mutations” by genomic scientists. Many such variations in the genome are beneficial, conferring selective advantages in appearance, performance and health. On the other hand, some variations are not advantageous for dogs. It is well known that cancer, for example, is the result of mutation in certain specific genes that control cell growth, cell division, and cell lifespan.

How does this relate to Westies?

There are some diseases that occur more commonly in Westies than in other breeds. The reason for this is undoubtedly tied up in the genome of the breed. Selective breeding over hundreds, if not thousands of years, has developed the Westie with certain characteristics such as size, stature, coloration and even personality. At the same time that these desirable characteristics were selected by careful breeding, other less desirable characteristics also developed. Some of these less desirable mutations were linked (literally, in the DNA and chromosomes) to more desirable breed characteristics – sort of ‘hitching a ride’ in the Westie genomic pattern. Because of these linked mutations, Westies are predisposed to the development of some diseases, just like Golden Retrievers are predisposed to develop malignant lymphoma and Bulldogs get more brain tumors. We know that while dogs may be predisposed genetically to developing some diseases, there are also many identified and unidentified environmental influences on disease development, expression and severity. This complex interplay between genome and environment is an area of intense scientific study.



A very good first step in making progress in understanding which diseases are common and for beginning the study of genomeenvironmental relationships are health surveys, conducted by the Westie Foundation of America and also the West Highland White Terrier Club of America. The results of recent studies serve as an excellent starting point for discussion of diseases that follow.

It is now our job to find the specific genes in the Westie genome that are related to common diseases. Once this is done, more effective treatments for these diseases can be found, and concerned breeders, owners, veterinarians and scientists can work together to eliminate these problem genes, while maintaining happy, healthy populations of Westies for centuries to come.

Common Diseases of Westies

In 2005, the Westie Foundation of America and the Health Committee of the West Highland White Terrier Club of America conducted a study to determine the owner-reported prevalence of 27 diseases in West Highland White Terriers using an anonymous survey distributed by mail to approximately 6,000 homes owners and breeders in 2005. Follow-up mailings to non-responders were not conducted, as no effort was made to track returns. This was the result of a decision to make the surveys completely anonymous in an effort to increase response rates and the validity of reported information.

The results of that study were made available in 2007 on the Foundation’s website. In the report prepared by Dr. J. Kevin Grayson, author of the report, the following conclusions were made:

The prevalences of targeted diseases remain essentially unchanged between the 2000 and 2005 surveys. For some common diseases, such as: atopic dermatitis, deafness, luxated patella, and Legg-Perthes disease; the prevalences have actually increased. For others, such as: aggression, deafness, diabetes, and pulmonary fibrosis; modest decreases were realized.

Progress is being made at many veterinary schools on determining the mode of inheritance and new treatments for many of these conditions. Continued financial, data, and case material support for these programs will greatly benefit the breed in the future. Some of the interesting findings of the 2005 study are summarized below.

An ongoing health Survey (2012-present) can be found at www.offa.org. The WFA and West Highland White Terrier Club of America conducted the survey as a joint project. We encourage all Westie owners to participate in this survey answering for dogs both past and present. This information determines how the WFA designates how research dollars are spent.

Comparison of prevalence of targeted diseases in 2000 and 2005:

<u>2000</u>
Atopic Dermatitis
Aggression
Luxated Patella
Dry Eye
Legg-Perthes Disease
Cranio-mandibular Osteopathy
Pulmonary Fibrosis
White Shaker Syndrome, Addison’s Disease, Diabetes

<u>2005</u>
Atopic Dermatitis
Luxated Patella
Aggression
Inflammatory Bowel Disease
Legg-Perthes Disease
Dry Eye
Addison’s Disease
Lymphoma
White Shaker Syndrome