

The Top 5 Genetic Diseases in Cats

Unlike purebred dogs and cats, most domestic cats reproduce without interference from humans. And that's a good thing as it helps dilute disease-causing genes, so non-pedigree cats acquire fewer inherited disorders. Here's how to help protect predisposed kitties from the top five genetic diseases.

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STORY AT-A-GLANCE

- A recent DNA-based study, the largest of its kind to date, identified 13 genetic variants associated with feline disease that are present in more pedigreed breeds than previously thought
- The results of the genotyping showed more genetic diversity in the non-pedigreed cat population than the pedigreed population; the study also revealed three disease-associated variants found only in non-pedigreed cats
- The researchers believe their study demonstrates the importance of comprehensive genetic screening of feline variants in supporting domestic cat breeding programs, veterinary care, and health research
- According to feline experts at Tufts University's Cummings School of Veterinary Medicine, the top five genetic diseases in cats are lower urinary tract disease, diabetes, lymphocytic or plasmacytic inflammatory disease, polycystic kidney disease, and hypertrophic cardiomyopathy
- It's important to realize that just because a cat is predisposed to a certain inherited disease, it doesn't mean he or she will develop the condition, nor does it mean it can't be successfully prevented or treated

A recent collaboration between researchers at Wisdom Panel in the U.S. and the University of Helsinki in Finland has produced the largest-ever DNA-based study of domestic cats and has identified 13 genetic variants associated with disease that are present in more pedigreed breeds than previously thought.¹

The good news is that the variants are declining in frequency in cat breeds that are regularly screened for the genetic markers.

Study Looked for 87 Genetic Variants in Over 11,000 Cats

As part of this massive study, the research team performed DNA sequencing of over 11,000 domestic cats, including 90 pedigreed breeds and breed types, and 617 non-pedigreed cats, and looked for 87 genetic variants associated with physical appearance, blood type, or disease.

The results of the genotyping revealed there was more genetic diversity in the non-pedigreed cat population than the pedigreed population, and there were three disease-associated variants found only in non-pedigreed cats. The researchers also identified 13 disease-associated genetic variants in 47 breeds that weren't previously known; they also found that the frequency of some markers had declined since they were first identified.

For example, a variant associated with polycystic kidney disease, PKD1, which is reported to affect 40% of Persian cats, wasn't found in any of the 118 Persians in the study, but was found in some Maine Coons and Scottish Straights. According to lead study author Heidi Anderson of Wisdom Panel:

*"This study demonstrates the clinical utility and importance of comprehensive genetic screening of feline variants in supporting domestic cat breeding programs, veterinary care and health research."*²

Top 5 Genetic Diseases in Cats

Unlike purebred dogs, most domestic cats reproduce without interference from humans. This helps to dilute disease-causing genes in their lineage, with the result that they acquire inherited disorders less often. However, as the study above demonstrates, pedigreed cats tend to follow a more predictable pattern of disease inheritance much like their canine counterparts.

Pet insurance carriers and animal hospital databases keep records of the most frequently diagnosed diseases in felines that are "... complexly inherited and involve combinations of multiple genes and environmental factors," according to Dr. Jerold S. Bell of the Cummings School of Veterinary Medicine at Tufts University.³

"Genetic diseases should be recognized in practice because they must be treated as chronic illnesses - not episodic diseases," says Bell, who lists the top five genetic diseases of cats as feline lower urinary tract disease (FLUTD), diabetes mellitus, lymphocytic or plasmacytic inflammatory disease, polycystic kidney disease, and hypertrophic cardiomyopathy.

It's important to keep in mind that just because some veterinarians believe certain disorders are inherited in certain breeds, it doesn't mean your cat of that breed is destined to develop those conditions.

There are steps you can take to help prevent your kitty from acquiring diseases to which she may be predisposed, and there are ways to successfully treat or effectively manage existing genetic conditions.

Feline Lower Urinary Tract Disease

Feline lower urinary tract disease (FLUTD) is actually a group of conditions affecting the urinary tract or urethra of cats, including cystitis, bacterial infection, and urethral blockage. According to Bell, FLUTD is the most frequently seen inherited condition in domestic cats.

FLUTD isn't passed from cat to cat, as evidenced by the fact that it often occurs in just one kitty in a multi-cat household. Persians may be at increased risk for lower urinary tract problems, while Siamese may be at decreased risk.

In one study, when exposed to stressors, only kitties predisposed to FLUTD developed symptoms,⁴ and their gene expression profiles were similar to those found in humans with interstitial cystitis.

If your cat has FLUTD: She needs to drink more water, urinate more, and eat an anti-inflammatory, moisture-rich diet of either human-grade canned food or a fresh, nutritionally balanced whole food diet. It's also important to identify potential sources of food allergies and offer therapeutic supplements.

A urinary tract infection may be an underlying cause of your kitty's FLUTD, but too often, antibiotics are given without a culture and sensitivity test. If your vet suggests antibiotics to kill bacteria present in a sterile urine sample, insist on a bacterial culture to identify the correct treatment.

It's also extremely important to focus on reducing or eliminating potential stressors in your cat's life. Stress typically has three different sources: environmental, immunologic, and nutritional.

According to one study, cats with feline idiopathic cystitis (FIC), showed 75% to 80% improvement in symptoms when they were fed at the same time each day, their litter boxes stayed in the same location, and regular playtime was encouraged.⁵

Diabetes

Any cat can develop diabetes mellitus, but Bell cites studies that show the condition may be more prevalent in certain breeds, including the Burmese, Siamese, Norwegian Forest, Russian Blue, and Abyssinian.

Obesity is most definitely a predisposing factor for diabetes in felines, and in my experience, regardless of the cat's genetics, being overweight and eating a carbohydrate laden dry food diet are by far the biggest risk factors for diabetes.

If your cat has diabetes mellitus: Treatment of feline diabetes is complex and time consuming. It involves regular monitoring of blood glucose levels, ongoing dietary adjustments, insulin given by injection or oral glucose-regulating drugs, and keeping a constant, careful eye on your sick kitty.

Prevention is obviously the best "cure" for this disease, so I hope you'll give serious consideration to the importance of species-appropriate nutrition, exercise, and maintaining your cat at a healthy weight in preventing diabetes and other serious diseases.

You can help him stay trim by feeding a portion controlled, moisture-rich, low carb meat-based diet consisting of a variety of unadulterated protein sources and healthy fats, and specific nutritional supplements as necessary.

Kitty also needs to get moving. I recommend a minimum of 20 minutes of daily exercise. You'll need to get creative to keep your cat physically active, but it can be done!

Lymphocytic or Plasmacytic Inflammatory Disease

Interestingly, this immune-mediated inflammatory condition in cats typically takes the form of either gingivostomatitis (a very painful, chronic disease of the mouth), or as inflammatory bowel disease (IBD). Fortunately, it's rare that a cat develops both forms.

Siamese and other Asian breeds are predisposed to the IBD form of the disease. Other risk factors include food intolerances, sensitivity to the body's own microbiome, and behavioral stress. According to Bell, cats affected by this disease "... show a lifelong propensity to inflammatory cell infiltration that does not occur in other cats in the same household."

If your cat has gingivostomatitis: View my article on feline stomatitis for a complete discussion of the disease, treatment options, and advice on a proactive approach to managing your kitty's condition. **If your cat has IBD:** I recommend my article on inflammatory bowel disease.

Polycystic Kidney Disease

Polycystic kidney disease (PKD) is caused by a specific defective gene, and there's a DNA test available to check for it. According to Bell, the gene is present in 6% of cats worldwide, and 38% of Persian kitties. It is also prevalent in Himalayans and other Persian-type breeds.

The age range for kidney failure in PKD cats is 4 to 10 years, with 7 years as the average. Some kitties with the gene are lucky in that they develop just a few cysts and are able to maintain normal kidney function.

If your cat has polycystic kidney disease: The treatment is the same as for any form of chronic kidney disease, and includes controlling uremia (the buildup of nitrogenous waste products in the blood), delaying the progression of the disease, and maintaining the cat's quality of life.

Treatment involves fluid therapy (which many cat parents learn to administer at home), a diet high in excellent quality protein and lower than normal amounts of sodium and phosphorous, and unlimited access to fresh drinking water.

Vitamins and minerals can sometimes be beneficial. I often add a variety of the B-vitamins to a cat's sub-Q (subcutaneous) fluids. B-vitamins can help with anemia, improve a cat's overall feeling of well-being, and help with nausea. I also recommend using a probiotic specially formulated for kidney support with a blend of amino acids that support kidney health.

Improving the quality of your cat's diet to include excellent quality, highly digestible human-grade protein is critical. A specialized kidney-friendly diets can be beneficial as well, along with phosphorous binders and sodium bicarbonate, if appropriate. Your veterinarian will help you decide if these are indicated based on your pet's specific situation. Making your cat's environment as stress-free as possible is also very important.

Hypertrophic Cardiomyopathy

Hypertrophic cardiomyopathy (HCM) is the most common type of heart disease in cats, and it can be inherited or acquired. According to Bell, a gene mutation linked to the condition occurs in 33% of Maine Coons and can cause heart failure or sudden death in kitties from 6 months of age to 7 years.

In addition, 20% of Ragdolls carry a different mutation in the same gene that causes HCM. A genetic test is available to check for both mutations in Maine Coons and Ragdolls. HCM also occurs, typically around midlife, in individual cats of the two breeds who don't carry the gene mutation, as well as in many other kitties.

If your cat has hypertrophic cardiomyopathy: If the cat is asymptomatic, I prefer to prevent the need for ACE inhibiting drugs by starting HCM patients on nattokinase to reduce the risk of blood clots, preventively.

I've also found that fucoidan, a polysaccharide extracted from brown seaweed, is exceptional at preventing saddle thrombus, a condition that can occur in up to 25% of cats with HCM. Fucoidan also has blood thinning properties that your integrative veterinarian should talk to you about.

Unfortunately, no drugs have proved consistently effective in improving heart function in HCM patients. And sadly, often cats with HCM are not treated until congestive heart failure has developed.

I've successfully treated many patients with this heart condition using a combination of high doses of ubiquinol and omega-3 fatty acids, as well as certain amino acids, including taurine, L-arginine, and acetyl L-carnitine. I also use heart glandulars and herbs, including hawthorn.

Because amino acid deficiency (a dietary shortage of meat-based protein) can fuel HCM, I strongly recommend that all my cat patients consume a human-grade, minimally processed meat-based diet, and eliminate all fillers such as grains and unnecessary carbohydrates.

I also think we've underestimated the role of vitamin D in companion animal medicine, and its role in heart disease, as well. Identifying and treating vitamin D deficiency is an important step in reducing diet-related cardiovascular stress.

Sources and References

¹ [Anderson, H. et al. PLOS GENETICS, June 16, 2022](#)

² [ScienceDaily, June 16, 2022](#)

³ [Clinician's Brief, December 2016](#)

⁴ [Applied Animal Behaviour Science. 2013;143\(2-4\):157-163](#)

⁵ [Journal of the American Veterinary Medical Association, January 1, 2011, Vol. 238, No. 1, Pages 67-73](#)
