

This Breed Is More Predisposed to Devastating Disease

It appears to be caused by a genetic anomaly that causes deformities, sometimes severe. These pups have incompetent immune systems and will need a special regimen their whole life. But their lifespan is typically only about 2 years.

Reviewed by Dr. Becker

STORY AT-A-GLANCE

- Lethal acrodermatitis (LAD) is a devastating disease that occurs only in Bull Terriers and Miniature Bull Terriers
- A team of researchers identified the gene mutation that causes LAD, which will help veterinarians more quickly diagnose the disorder, and will also help breeders avoid breeding affected dogs
- The severity of LAD ranges from mild to severe; puppies with the most severe form of the disease are typically euthanized
- This devastating disease is another heartbreaking example of the dog breeding crisis that has occurred over the last hundred years, which has perpetuated genetically predisposed diseases in many purebred dogs
- Pups with milder disease can live from a few to many years with good quality of life if they receive the proper veterinary and home care, which include a clean, all-natural, liquefied diet and a treatment protocol to effectively deal with symptoms as they arise

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If you don't have a Bull Terrier or know someone who does, you've probably never heard of a devastating disease called lethal acrodermatitis (LAD). It was first recognized in the mid-1980s, and was initially thought to be a nutritional or infectious disease. However, since LAD occurs exclusively in Bull Terriers and Miniature Bull Terriers, scientists soon realized it was an inherited disorder.

An international team of researchers identified the gene mutation that causes the disease. Their findings were published in the journal PLoS Genetics.¹ Per Phys.org:

“Researchers compared the genomes of LAD affected and healthy dogs to pinpoint the cause to a mutation in the gene that codes for the protein muskelin 1. The mutation alters the splicing of the messenger RNA and thus leads to a lack of functional muskelin 1, which plays diverse roles in cellular shape, adhesion and spreading, and intracellular transport.

While the physiological cause of LAD is still unknown, the findings reveal a novel role for muskelin 1 in maintaining a healthy immune system and skin.”²

The discovery of the mutation that causes lethal acrodermatitis will ultimately allow veterinarians to rapidly diagnose the disease, help prevent the breeding of affected dogs and "... provide a starting point to investigate the physiological cause of the various clinical manifestations related to LAD, which thus far has eluded researchers," according to Phys.org.

Interestingly, lethal acrodermatitis in Bull Terriers is similar to acrodermatitis enteropathica in humans and a disease called lethal trait A46 in black pied cattle. Both these disorders involve a problem with intestinal absorption of zinc. High doses of zinc reverse the symptoms in afflicted humans and cows, but have no effect in Bull Terriers.

Researchers assume there's some other problem with zinc absorption in LAD puppies, and because zinc deficiency is at the root of LAD symptoms, continued research in this area is ideal to identify the pathogenesis. In the meantime, we're left managing symptoms in affected dogs.

How Lethal Acrodermatitis Affects Bull Terrier Pups

Lethal acrodermatitis is characterized by symptoms of profound zinc deficiency, including poor growth, immune deficiency and skin lesions, especially involving the paws. There are varying degrees of LAD, from pups who are only mildly affected to those who are seriously deformed.³ LAD pups are always smaller than their littermates, which is the first tipoff, and can appear pink because their skin lacks pigment.

Regardless of the severity of the disease, LAD puppies have incompetent immune systems that leave them vulnerable to infection. Zinc plays a central role in the immune system by affecting cellular and humoral immunity and is necessary for the production of thymulin, a hormone produced by the thymus gland necessary for a functional immune response.

LAD pups are prone to upper respiratory infections that can range from a mild case of sniffles to bronchitis and even pneumonia. Historically, these pups are often started on lifelong antibiotics and steroids (prednisone).

Some classes of antibiotics (particularly tetracyclines) further inhibit zinc absorption from the gut, and prednisone can suppress the immune system, so it's better to take a proactive approach with these puppies, knowing they will need intensive, lifelong supplementation and daily management for their time on this earth.

Puppies are recommended to begin supplemental colostrum immediately, which provides additional immunoglobulins for their deficient immune systems. Olive leaf ("nature's antibiotic") and probiotics should also be provided indefinitely. Maintenance microbiome restorative therapy can also be very beneficial for LAD puppies.

Diffusing frankincense **essential oil** is a proactive way to dramatically reduce the likelihood of pneumonia in immunocompromised patients and would suggest it for these pups, too.

LAD Invariably Causes Mobility Problems

Zinc is necessary for normal bone formation and development. It also plays a part in regulating calcitonin secretion from the thyroid gland and also affects bone matrix calcification and collagen synthesis, so bone and cartilage abnormalities are inevitable, even in puppies with a mild form of LAD.

An abnormal gait resulting from a deformity of the hips that causes malformation of the femur (thigh bone) coupled with a luxating patella (floating kneecap) is a common sequelae for these pups. The deformity is inoperable, but most puppies cope quite well with appropriate physical therapy and natural pain management, if needed.

Partnering with a rehab vet as soon as possible and beginning in-home physical therapy (in veterinary medicine we call it “rehabilitation”) is the best way to slow the progression of joint degeneration and help LAD pups develop compensatory muscle tone and strength.

The front feet of these puppies are almost always a problem. Their toes are splayed and they appear to walk on the pasterns (the area below the wrist but above the foot). The skin on the footpads is very hard and ultimately deforms the feet, which can cause pain and significant mobility issues.

Historically, breeders have used “Stockholm Tar” (pine tar) to manage the keratin abnormalities that occur on these puppies’ feet. Needless to say, this can be messy and some pine tar contains creosote, which may be carcinogenic. A gentler option can be a thick slather of manuka honey (created from tea tree, which has natural antibiotic properties) followed up with padded booties or wraps. DMSO can be added to medicinal honey for advanced pad problems.

Skin Lesions Are Also a Significant Problem

Collagen in skin is produced by zinc-dependent enzymes, and when a LAD puppy reaches about 6 to 10 weeks of age, crusty sores often begin to develop between the toes and quickly progress to involve the nail bed, which disrupts nail growth. Around this time lesions may also begin to appear on the face and around the eyes, the third eyelid may protrude and affect the pup’s vision, and inflammation can develop at the hair root, especially around the elbows and hocks.

Zinc has direct antimicrobial activity, so zinc-based products will help manage these chronic wounds. Skin needs to be disinfected every 12 hours with a nontoxic antimicrobial solution.

Feeding a Puppy with LAD

Puppies with LAD typically have an abnormally high arch to the palate (another bone and collagen developmental abnormality) that causes food to stick to the roof of their mouths. Not only is this uncomfortable for the pup, but it can create quite a mess each time they eat, and most importantly, it can also interfere with their ability to get the calories and nutrients they need.

Nutrient bioavailability from highly processed “dog food” has not been studied (and is very questionable) and the “feed-grade” quality of synthetic zinc supplements used in pet food has also not been evaluated for absorption. Because gut health is compromised in these puppies, feed human-grade real food.

In humans, the body absorbs 20% to 40% of the zinc in food, with animal-based sources of zinc being much more absorbable than plant sources. Zinc is also more readily absorbed with a protein meal, and because the body can’t store adequate amounts of zinc efficiently (except in bone), it needs to be supplied in a biologically available form on a daily basis. Cereal-based diets (kibble) containing phytates can impair zinc absorption, another reason to avoid starch-based kibble.

In addition, because LAD puppies are immunocompromised and prone to severe skin allergies (a common outcome of dysbiosis), their diets should be completely free of all additives, preservatives and colorings.

The ideal diet for a LAD puppy is a human-grade, homemade, nutritionally balanced fresh food diet with higher levels of zinc (60mg/1000kcal) coming from whole food sources (oysters and liver) supplemented with food-based zinc to meet necessary nutritional requirements.

Since LAD pups tend to develop **food sensitivities**, it's important to constantly monitor both skin and poop quality for signs of a problem. A fresh diet of clean food and rotating protein sources every few months will help prevent food allergies, as will a dysbiosis protocol with guidance from your integrative or functional medicine veterinarian. Dogs affected with LAD must never be vaccinated; the adjuvants in the vaccines can prompt a rapid immunologic decline.

Outlook for Bull Terrier Puppies with Lethal Acrodermatitis

With proper health care and the same socialization and TLC healthy dogs receive, puppies with mild LAD can be wonderful companions for pet parents who accept that their dog probably won't live a normal lifespan.

Pups with severe disease and those diagnosed soon after birth are typically euthanized. Puppies with a milder form of LAD often go undiagnosed or initially misdiagnosed and are sold as pets, and by the time they receive an accurate diagnosis, their owners have bonded with them and committed to doing whatever they can to help them.

The average lifespan for a pup with lethal acrodermatitis is about 2 years, but if the condition is relatively mild and the pet parent is highly committed and working closely with an **integrative or holistic veterinarian** who has experience with a variety of natural therapies, there's no reason a dog with LAD can't live many years with a good quality of life.

This devastating disease is another heartbreaking example of the dog breeding crisis that has occurred over the last hundred years, which has perpetuated genetically predisposed diseases in many purebred dogs. The only way out of these genetic nightmares is by testing breeding animals for all heritable diseases possible and sterilizing all affected animals.

If you are going to shop and not adopt, the only responsible option is to partner with a breeder you know and trust. Good breeders practice "reparative conformation" breeding, which means they have proactively done all DNA testing possible (and show you the results) and are intentionally breeding genetic flaws out of their animals.

Do not buy animals from pet stores (aka **puppy mills**) that do not do any genetic testing and are a leading cause of the perpetuation of some of these horrific diseases.

Sources and References

[Popular Science March 23, 2018](#)

¹ [PLoS Genetics, March 22, 2018](#)

² [Phys.org, March 22, 2018](#)

³ [Bull Terrier Monthly \(Archived\)](#)
