

 PURINA
PRO PLAN

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RESEARCH OF Intervertebral Disk Disease in Dachshunds

FOCUSES ON IMPROVING RECOVERY

Dachshund owner Charlotte Borghardt remembers clearly the morning her 7-year-old Miniature Longhaired Dachshund “Lucky” (Teckelhof’s Skylark v. Sugardachs RE CGCA) couldn’t get up from her bed to eat breakfast. Instead of eagerly running to her food bowl, the normally energetic Doxie moaned and shivered in pain.

“I suspected intervertebral disk disease (IVDD) right away,” says Borghardt, chair of the Dachshund Club of America Health Committee.

A sometimes crippling disease, IVDD affects 19 to 24 percent of Dachshunds,^{1,2} more than any other breed. The disease occurs when the intervertebral disks, the shock absorbers between the vertebrae of the spinal column, bulge or burst, becoming herniated. Pressing on the nerves in the spinal cord, these disks can cause pain, nerve damage, loss of bladder and bowel control, and paralysis.

IVDD cases range from mild or moderate (Type I) to severe (Type II). Dogs with Type I disease generally heal over

time and are able to resume their normal routine and walking. There is not always a clear event that causes this injury. In some Dachshunds, it may appear one to five days after a forceful impact. Jumping or falling may cause one or more disks to burst, pressing into the spinal canal and resulting in cord compression and irritation. Among other reasons, it may occur due to a prematurely aged disk.

Type II IVDD is usually seen in dogs that have chronic difficulty climbing stairs, walking or rising from a relaxed position.



Teckelhof’s Skylark v. Sugardachs RE CGCA (“Lucky”), a Miniature Longhaired Dachshund, excelled in rally until being forced to stop due to intervertebral disk disease (IVDD), a potentially crippling disorder that affects from 19 to 24 percent of Dachshunds.^{1,2}

Typically, the vertebrae begin a spondylosis process and may even bridge together to mediate the instability caused from the lack of a functioning shock absorber — the disk. In severe cases, the dog may become incontinent or paralyzed. Surgery performed shortly after a diagnosis helps to relieve pressure on the spinal cord and increases the chance of recovery.

The standard of care is decompression surgery that involves removing a window of bone to access and remove the herniated disk material compressing the spinal cord and causing pain. This is followed by rehabilitation focused on helping a dog regain motor function in the pelvic limbs with a series of exercises that owners can learn how to perform at home. Underwater treadmill work also can be beneficial.

Decompression surgery is not always an option for owners due, in part, to the cost. The \$5,000 surgery, depending on the geographical location of the veterinary practice, may be cost-prohibitive for owners and thus require them to care for a disabled dog that may need a wheelchair for mobility or, in the worse case, euthanize their dog.

Disability associated with intervertebral disk herniation (IVDH) may include an inability to walk or control bowel and bladder function, along with secondary conditions such as pressure ulcers from remaining in a recumbent position and recurrent urinary tract infections from incomplete emptying of the bladder. If a wheelchair is needed, it must be custom-fitted to the individual dog to ensure the most comfort and utility of the cart.

In Lucky's case, "the veterinarian prescribed an anti-inflammatory medication to help reduce the swelling of the disk and ordered crate rest," says Borghardt, of Sierra Vista, Arizona, a second-generation Dachshund breeder. "Lucky bounced back, but a month later, the pain and immobility returned."

Conservative treatment, such as Lucky received, can sometimes provide an option to let the disk heal. Medication and crate rest worked well with Lucky the second



Owner Charlotte Borghardt and Lucky are pictured at a rally event before the Dachshund was diagnosed with IVDD.

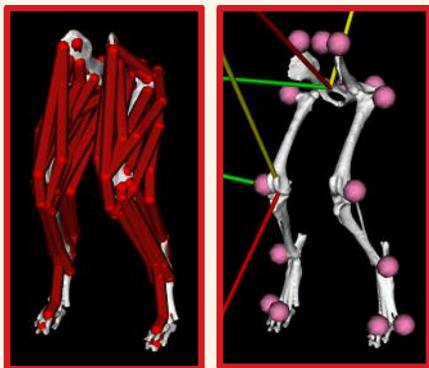
time, too. Rehabilitation initially and after recovery helps to build core strength and proprioception, and thus helps to prevent a recurrence.

"I stopped training Lucky for her RAE (Rally Advanced Excellent) title after this second incident even though she was halfway through the requirements," Borghardt says. "Fortunately, she has not had another occurrence."

Despite efforts to learn the cause of IVDD in Dachshunds, no discoveries have found a genetic link distinguishing affected dogs from healthy dogs. Without a direct DNA test, or even a genetic marker test, breeders are not able to health test sires and dams to reduce disease incidence. Unfortunately, since IVDD may not occur until a dog is 6 to 8 years of age, this is often after a dog has been bred.

Gaps in knowledge about IVDD and the high prevalence rate in the breed prompted the Dachshund Club of America (DCA) to fund two one-year research studies aimed at learning more about characterizing gait recovery in dogs with IVDH and in describing the kinetic and kinematic recovery of dogs with spinal cord injury. The American Kennel Club Canine Health Foundation administered and managed the grants, which are ongoing.

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Computer simulation enables Dr. Gina Bertocci, of the University of Louisville, to study the hind-limb motion and muscle activation patterns of healthy dogs and those recovering from intervertebral disk disease surgery.

DCA Funds Two Related IVDD Studies

In her DCA-funded study, Gina Bertocci, PhD, professor and endowed chair of biomechanics in the Department of Bio-engineering at the University of Louisville, focused on understanding muscle function in healthy Dachshunds and in those with moderate IVDH associated with spinal cord injury after having surgical decompression during recovery. The goal was to better understand the recovery of affected dogs, particularly regarding muscle activation patterns.

“Muscle activation plays a key role in whether dogs regain full function of their limbs,” Dr. Bertocci says. “We know that neurologic disruption following IVDH alters muscle recruitment strategies leading to compensatory changes in muscle function post-injury. It is important to better understand muscle activation during walking following an IVDH-associated spinal cord injury in order to develop strategies to enable full recovery.”

The research involved using computer simulation models to characterize differences between the healthy and IVDH dogs’ hind-limb motion and muscle activation patterns, as well as differences in dogs with IVDH throughout recovery. Dr. Bertocci’s research team previously developed landmark computer simulation techniques that have transformed the understanding of stifle biomechanics in cranial cruciate ligament disease.

“The idea was to better understand recovery following surgery so we can potentially help dogs with therapeutic interventions involving rehabilitation or pharmaceutical agents,” explains Dr. Bertocci. “We developed computer models based on medical imaging and hind-limb motion, ground reaction forces and the amount of body-weight support during walking. This enabled us to characterize differences in hind-limb motion and muscle activation patterns during walking between a healthy

dog and one with an IVDH-associated spinal cord injury, as well as differences in the injured dog throughout recovery.”

At Texas A&M University, research led by Gwendolyn J. Levine, DVM, DACVP, clinical assistant professor, used kinematics, or computerized gait assessments, to characterize gait recovery in Dachshunds with IVDH. “We used dogs with moderate and severe injuries to capture the spectrum of dysfunction and recovery that occurs after injury,” explains Dr. Levine.

In this study, all dogs received standard spinal decompression surgery. They were assessed before surgery and following surgery at 3, 7, 30, and 90 days. The information was compared to the gait of healthy Dachshunds.

“We believe that kinematics is more sensitive than traditional qualitative scoring to determine injury sensitivity



Using biomechanics, Dr. Bertocci and Dr. Gwendolyn J. Levine, of Texas A&M University, are able to analyze a dog’s gait.

and recovery and to identify if therapies are effective,” Dr. Levine says. “Ultimately, we gained a better understanding of the subtle improvements in gait that are made as animals recover from spinal cord injury. We hope to use this information to develop targeted physical rehabilitation protocols to improve motor recovery in affected dogs.”

Educating Owners & Veterinarians

Dachshund owners should be on the lookout for signs of IVDD. Lethargy and reluctance to play in otherwise healthy, active dogs could indicate a problem. Other signs include scrapes or abrasions on the top of a rear paw from dragging it

on the ground, uncoordinated walking, shivering or shaking, poor appetite, sensitivity to being touched on the neck or back, and uncontrollable bladder and bowel function.

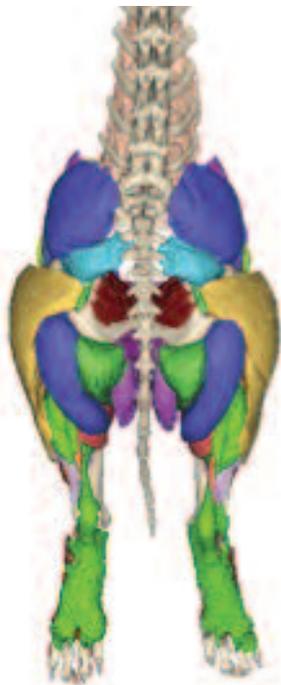
Linda Stowe of Frisco, Texas, went through IVDD with four Dachshunds. When her first one, “Jolene” (CH Corlins Jolene), suffered paralysis and underwent IVDD surgery in 2002, Stowe connected with other owners via a Forum, a website and later a [Facebook page](#).

“I was new to IVDD and wanted to find out as much as I could about the disease,” she says. “Even today, at least once a day someone asks me on Facebook what to do when their dog is paralyzed. I’ve discussed IVDD cases with thousands of people to let them know a disk episode is not the end of the world and to give them support as a fellow owner. I always tell people to take their dog immediately to their veterinarian for a diagnosis and treatment.”

Although there is no panacea for preventing IVDD in Dachshunds, avoiding obesity is an important consideration. “Keeping a dog in ideal body condition helps to reduce stress on the spine,” says Dr. Bertocci.

“Owners should work to prevent their dogs from becoming obese,” Dr. Levine agrees. “They also should work with their veterinarian to develop a physical fitness plan that includes activities like leash walks.”

Another consideration is to use a harness for walking rather than a collar and leash, which can stress the neck and spinal column. Minimizing high-impact activities, such as jumping, running up and down stairs, wrestling with other dogs, and playing tug-of-war is helpful as well.



This computed tomography (CT) scan allows Dr. Bertocci and Dr. Levine to view a dog's muscle segmentation to help them understand changes that occur after a spinal cord injury.

Ramps and steps made for dogs may be helpful for high places that dogs like to go, such as chairs, sofas and beds. This helps to prevent jumping and the risk of falling. Dachshund owners also should make sure their dog is comfortable in a crate so the adjustment is easier should crate confinement be necessary after surgery or an episode of back pain.

Educating veterinarians about IVDD research and the latest findings is part of the mission of the DCA Health Committee. Stowe, a member of the committee, helped prepare and distribute brochures to veterinarians about new studies and the latest information about treating the disease.

“Not all veterinarians are familiar with IVDD,” Stowe says. “Some may only see a few Dachshunds in their practice, for example. Anything we can do to help advance education about IVDD among veterinarians and owners will hopefully help.”

Borghardt agrees. “Efforts to educate others about IVDD and to fund research to learn more about treatment options are imperative. This is why DCA continues to fund researchers who are interested in working with us on IVDD. One of these days, we may learn how to avoid breeding dogs that develop this crippling disease.” ■

¹ Ball MU, McGuire JA, Swaim SF, et al. Patterns of Occurrence of Disk Disease Among Registered Dachshunds. *J Am Vet Med Assoc.* 1982;180:519-522.

² Priester WA. Canine Intervertebral Disk Disease Occurrence by Age, Breed and Sex Among 8,117 Cases. *Theriogenology.* 1976;6:293-303.

Purina appreciates the support of the Dachshund Club of America and particularly Charlotte Borghardt, chair of the DCA Health Committee, in helping to identify topics for the *Purina Pro Plan Dachshund Update* newsletter.

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Purina Parent Club Partnership Program Advances Canine Health Research

In 2016, 193 national parent clubs participated in the Purina Parent Club Partnership (PPCP) Program, raising more than \$438,406. Half of the amount raised, \$219,203, went to the parent clubs' Donor Advised Fund at the American Kennel Club Canine Health Foundation, and an equal amount went to the parent clubs for education, research and rescue efforts. Since it began in 2002, the PPCP Program has raised more than \$6.5 million, half of which supports canine health research funded by the Foundation. Members of *Purina Pro Club* who have designated a breed of dog and submitted [weight circles](#) from qualifying *Purina* brand dog foods have contributed to the program.

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Ann Viklund of Purina, center, presents the 2016 PPCP donation to Dr. Diane Brown, CEO, and Dr. Charles Garvin, chair, of the AKC Canine Health Foundation. An equal amount was distributed directly to the participating parent clubs.



Corey Benedict of Purina unveils the oil painting of "Preston," done by artist Linda Draper, at the Purina Pro Plan Show Dogs of the Year Awards dinner Feb. 11 in New York.

artist Linda Draper. The 5-year-old male, who was handled by Linda Pitts, of Knoxville, Tennessee, won 83 Bests in Show and 159 Herding Group Firsts in 2016.

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Posing after the presentation of the Purina Pro Plan Champions Cup Award are, from left: Michael Pitts, owners Ellen Charles and Jackie Beaudoin, owner-handler Linda Pitts, Connie Wagner of Purina, owner Penny Kelly, and Brandon Edge, Linda Pitts' assistant.

'Preston,' the Puli, Wins the 2016 Purina Pro Plan Champions Cup

The No. 1 all-breed show dog in the country in 2016, "Preston," the Puli, also tallied the most points to win the *Purina Pro Plan* Champions Cup. Among his prizes, Multi-BIS/Multi-BISS GCH Cordmaker Mister Blue Sky received \$10,000 and an original oil painting by nationally acclaimed portrait

Purina Pro Plan Introduces SAVOR Shredded Blend Small Breed Lamb & Rice Formula

Purina Pro Plan recently launched SAVOR Shredded Blend Small Breed Lamb & Rice dog food, formulated especially for adult dogs weighing 20 pounds or less. This high-protein food, with lamb as the No. 1 ingredient, complements *Purina Pro Plan* SAVOR Shredded Blend Small Breed Chicken & Rice Formula by offering an alternative protein source. Both dog foods are formulated to meet the needs of highly active small dogs and have nutrient-dense, highly palatable, bite-size kibble combined with small tender, shredded pieces. The complete and balanced Lamb & Rice formula includes calcium, phosphorus and other minerals to help maintain strong teeth and bones; natural prebiotic fiber, sourced from wheat bran, to help promote digestive health; and vitamin A and linoleic acid, an omega-6 fatty acid, for healthy skin and coat.



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Want to Reach the Editor?

Have comments about the *Dachshund Update*? Send them to: Barbara Fawver, Editor, Nestlé Purina PetCare, 2T Checkerboard Square, St. Louis, MO 63164 or via email at editor@purina.nestle.com.

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