



GERMAN SHEPHERD DOG Update

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STUDY FINDS

Early Spay-Neuter Surgeries in German Shepherd Dogs Increase Risk of Joint Problems

For the past three decades, there has been a trend toward early spaying and neutering of dogs for reasons such as avoiding unwanted breeding and reducing some diseases such as mammary and prostate cancers. Some people believe that spaying and neutering helps to avoid behavioral problems. The impact has been dramatic, with an estimated 85 percent of dogs in the U.S.¹ currently being spayed or neutered.

Breeders have an important role in helping puppy buyers determine at what age to neuter or spay their dog. They may require puppy buyers to neuter or spay their dog to avoid indiscriminate breeding, thus their recommendation is key in helping owners decide when to spay or neuter their German Shepherd Dog.

A retrospective study evaluating the long-term effects of spay-neuter surgeries in German Shepherd Dogs, published in

2016 in the journal *Veterinary Medicine and Science*, may change breeders' views about the safest age to recommend the procedure. The study reported a significant increase in cranial cruciate ligament (CCL) tears, or ruptures, in male and female German Shepherd Dogs neutered before 1 year of age, and it also noted a significantly higher incidence of urinary incontinence in female German Shepherd Dogs spayed before 1 year of age.



“I used to recommend neutering my puppies before they reached sexual maturity or at least spaying females before their first estrous season,” says Ginny Altman, of St. Paul, Minnesota, breeder of Rivaden German Shepherd Dogs since 1981. “Now, if the owner wants to neuter, I recommend waiting until the dog has matured and certainly waiting until they have quit growing, which is usually between 18 and 24 months of age.”

Altman attributes her change in perspective to the recent study in German Shepherd Dogs. The American German Shepherd Dog Charitable Foundation helped to sponsor the research, which was funded by the AKC (American Kennel Club) [Canine Health Foundation](#).

The research was based on the veterinary records of 1,170 intact and neutered German Shepherd Dogs in the medical database at the University of California-Davis Veterinary Medical Teaching Hospital. The report examined joint disorders and cancers previously associated with neutering that occurred in dogs from Jan. 1, 2000, to June 30, 2014.

The analysis involved a comparison of disease incidence in intact dogs with those neutered before 6 months of age, between 6 and 11 months of age, between 12 and 23 months of age, and from 24 months through 8 years of age. Three joint disorders, CCL, hip dysplasia and elbow dysplasia, and four cancers, osteosarcoma, lymphoma, hemangiosarcoma, and mast cell tumor, were followed through 8 years of age. Mammary cancer in females was followed through 11 years of age.

Lead investigator Benjamin L. Hart, DVM, PhD, DACVB, distinguished professor emeritus at the University of California-Davis School of Veterinary Medicine, says, “In general, larger dogs seem much more adversely affected with regard to joint disorders by spaying or neutering, but there also is breed and gender specificity. Thus, the risk-benefit ratio depends on the severity of the conditions affected by neutering, the conditions’ overall prevalence in that breed, and the degree to which neutering affects the risk of those con-

ditions. One size does not fit all when it comes to deciding whether to neuter.”

Dr. Hart, a clinical animal behaviorist, researches the behavioral effects of neutering or spaying in animals. An ongoing study of the health effects associated with spay and neuter surgery will provide analyses of a total of 31 breeds for which data has been compiled. When the work is completed later this year, the information will be available on an open-access website as a resource for breeders, owners, veterinarians, and researchers.

“Thus far, our findings have not associated an increase in diseases due to spaying or neutering in small breeds, and in the other breeds, disease risk was dependent on gender and whether spay or neuter surgery was performed before or after 1 year of age,” says Dr. Hart. “There is much misconception related to the impact neutering has on an animal and whether the age of neutering makes a difference. We knew we needed the research to be breed-specific rather than generalizing across breeds.”

In one of their publications, Dr. Hart’s team compared the long-term health effects of [neutering in Labrador Retrievers and Golden Retrievers](#) and found that neutering before 6 months of age doubled the incidence of one or more joint disorders in Labradors, and increased the risk in Goldens by four to five times. Spaying female Goldens through 8 years of age increased the rate of at least one cancer by three to four times that of intact females.

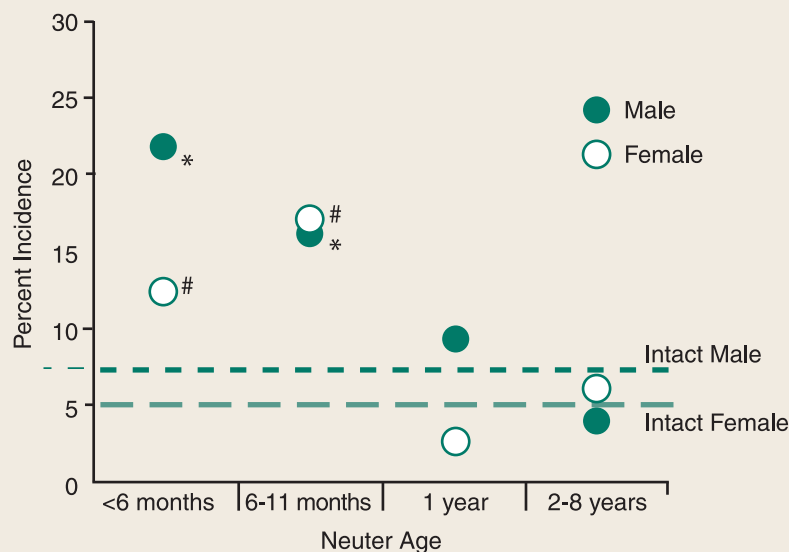
Increased Incidence of CCL Rupture

The decision whether to neuter or spay a dog often relates to the dog’s purpose. A German Shepherd Dog being campaigned at dog shows is not eligible for neutering or spaying because conformation involves judging dogs for their breeding potential. Dogs that compete in herding trials, obedience or rally, agility, tracking, and Schutzhund may be neutered or spayed, as these performance events are exempt from the breeding purpose that governs dog shows. However, owners may wish to avoid increasing the risk of a joint

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Neutering of German Shepherd Dogs: Associated Joint Disorders



Incidences of at least one joint disorder in male and female German Shepherd Dogs related to the age when neutered or spayed. The horizontal lines show the occurrences in intact males and females. Note that the main joint disorder associated with early neutering or spaying was cranial cruciate ligament rupture. *Vet Med Sci.* 2016;2(3):191-199.

* Significant differences compared to intact dogs

While neutering at less than 6 months of age and 6 to 11 months of age did not reach significance, when cases for the two early neuter periods were combined, the result was significantly higher than that of intact females

disorder such as hip dysplasia or CCL, as this could interfere with performance.

People who buy German Shepherd Dogs for companions may want to neuter or spay their dog to help prevent unwanted litters, to avoid bitches coming into season, and to lessen aggression and roaming tendencies in males, though Dr. Hart says evidence shows that neutering males after 1 year is as effective in controlling aggression as neutering before 6 months of age.

Neutering or spaying German Shepherd Dogs training for police or military work is optional. However, it is important that these dogs be healthy and fit to do their jobs, and neutering or spaying before 6 months of age could increase the risk of a debilitating joint disorder such as hip dysplasia or CCL.

Among all German Shepherd Dogs studied, hip dysplasia, a frequent disease in the breed, is doubled in risk to 7 to 8 percent by early spaying or neutering. However, CCL occurs in less than 1 percent of intact dogs but is increased in risk to 8 to 12 percent with early spay-neuter surgeries, resulting in this disease

being the main joint disorder impacted by early neutering in German Shepherd Dogs.

As the most common joint disorder in spayed or neutered dogs, CCL rupture also can shorten a dog's working career, is expensive to treat and requires weeks of rehabilitation. A critical stabilizer of the stifle (knee) joint, the CCL functions as a rope as it stabilizes the femur (thighbone) to the tibia (shinbone), preventing the stifle bone from shifting during activity. Without the normal CCL stabilization, a dog's movement is compromised and painful osteoarthritis develops.

In intact male German Shepherd Dogs, 6.6 percent were diagnosed with at least one joint disorder. The main joint disorder reported was hip dysplasia, which results from a loose connection between the pelvis socket, or acetabulum, and the thighbone ball, or femur head, which creates laxity in the hip joint. Degenerative joint disease, or osteoarthritis, commonly accompany this disease, causing pain and disability.

Male German Shepherd Dogs neutered before 6 months of age had an incidence rate of 20.8 percent of developing one

joint disorder — three times greater than in intact males. In dogs neutered from 6 to 11 months of age, the incidence was 16.4 percent — two times greater than in intact males. Although CCL rupture occurred in less than 1 percent of intact males, in dogs neutered before 6 months of age and from 6 to 11 months of age, the rate increased significantly to 12.5 percent and 8.3 percent, respectively.

Similarly, intact female German Shepherd Dogs showed an incidence rate of 5.1 percent of having at least one joint disorder. In contrast, those spayed before 6 months of age had an incidence rate of 12.5 percent — more than double that of intact females. In those spayed between 6 to 11 months of age, the rate was almost 17 percent — three times higher than in intact females. CCL, which was diagnosed in less than 1 percent of intact females, occurred in 4.6 percent of females spayed before 6 months of age and in 8.3 percent spayed between 6 and 11 months of age.

Because joint disorders can be related to body weight, the researchers also looked at whether the increased weight of neutered dogs could be responsible for CCL rupture, but they did not find a connection. Using a body condition score (BCS) based on a scale of 1 to 9, with 5 being ideal, they compared the body condition of neutered males with CCL ruptures to neutered males without CCL ruptures and found that the median BCS for both was 5. The median BCS for spayed females with CCL ruptures was 5.75 compared to spayed females without CCL ruptures having a BCS of 5.

"We think that early neutering prevents the gonadal hormone secretion that normally stimulates closure of long-bone growth plates as a dog approaches maturity," Dr. Hart explains. "The bones grow slightly longer than normal, which, in turn, disrupts joint alignment enough to lead to clinically apparent joint problems in some dogs."

Elbow dysplasia was virtually nonexistent in intact and neutered German Shepherd Dogs. This condition is caused by growth disturbances in the elbow joint due to a misalignment of growth between

the two bones in the foreleg between the radius (elbow) and ulna (wrist).

A noteworthy finding was that “dogs of either sex neutered after 1 year of age did not have significantly more joint disorders compared to intact dogs,” Dr. Hart says.

Risks Related to Urinary Incontinence & Cancer

Urinary incontinence is a disorder mainly affecting elderly female dogs in which they involuntarily pass urine. It is mostly diagnosed in neutered large-breed dogs. As expected, the condition was not reported in intact female German Shepherd Dogs, yet 7 percent of females spayed before 1 year of age were incontinent in their elderly years.

Fortunately, of the cancers followed in German Shepherd Dogs through age 8, there were few reports regardless whether a dog was intact or neutered. The research team cautioned that cancer rates could increase at later ages, though they did not study this.

Mammary cancer was tracked through 11 years of age because this type of cancer characteristically occurs later in life. About 4 to 5 percent of intact females and those spayed from 2 through 8 years were diagnosed with mammary cancer in contrast to no cases diagnosed in females spayed before 6 months of age.

Spaying has been attributed to helping to reduce the risk of mammary cancer, though a 2012 [published study](#) found neutering provided no apparent protection against mammary cancer. Dr. Hart notes that the protective factor could be breed specific. Regardless, in German Shepherd Dogs, the incidence of mammary cancer is fairly low.

A Proactive Preventive Approach

Given the results of this study showing the increased incidence of CCL rupture and urinary incontinence in German Shepherd Dogs that had early spay-neuter surgeries, breeders should consider the pros and cons before deciding the best age to recommend that puppy buyers spay or neuter their dogs. The purpose of a dog also should be consid-

ered in determining what is best for a companion dog, a working police dog, or a show or sporting competitor could be different.

A German Shepherd Dog that is neutered or spayed before 1 year of age and has a CCL rupture could be out of commission for months for surgery and rehabilitation. Urinary incontinence is an inconvenient disorder for owners to deal with because it requires frequent cleaning of urine from floors and bedding. It also is attributed to dogs being relinquished to shelters.

The most important finding in German Shepherd Dogs is that there is no advantage of neutering or spaying before 12 months of age. “I advise owners of German Shepherd Dog puppies to be in no hurry to neuter a male or spay a female,” Dr. Hart says. “I always tell them to wait until their dog is at least a year old before neutering.”

Altman believes that Dr. Hart’s research will help make it easier to convince breeders and owners that early neutering is not the healthy choice for German Shepherd Dogs it was once thought to be. “This study has been eye-opening for our breed,” she says. “Waiting until a dog is 1-year-old to be neutered or spayed is a simple way to help prevent the risk of these disorders.” ■

¹ Percentage of Dogs That Are Spayed or Neutered. APPA National Pet Owners Survey. American Pet Products Association: Greenwich, CT. 2017-2018:78.



Purina appreciates the support of the American German Shepherd Dog Charitable Foundation (AGSDCF), particularly Ginny Altman, current vice president and health liaison of the Foundation, and a past president and former chair of the Health and Genetics Committee of the German Shepherd Dog Club of America, in helping to identify topics for the *Purina Pro Plan German Shepherd Dog Update* newsletter. The AGSDCF board of directors also contributes to helping to identify topics.

Purina Pro Plan Incorporates NATURAL Formulas Into Existing Platforms

Purina Pro Plan is integrating existing NATURAL formulas, as well as adding new formulas, to the already strong FOCUS, SPORT and SAVOR platforms. Containing no artificial colors, flavors or preservatives and no poultry byproduct meal, the formulas are made without corn, wheat or soy, and include grain-free options. Additionally, two new formulas made without corn, wheat, soy, artificial colors or flavors, or poultry byproduct meal will be added to the BRIGHT MIND platform. Look for the formulas this summer.

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Handlers stack Standard Poodles during judging at the Poodle Club of America National Specialty in April at the Purina Event Center in Gray Summit, Missouri.

Purina Event Center Adds Amenities

Record-setting entries at the Poodle Club of America National Specialty, held in April at the Purina Event Center in Gray Summit, Missouri, helped confirm to club officials that holding the event in the Midwest after many years in the East was a good move. Recent upgrades to the classy dog show venue include improved cellphone reception, expanded Internet service to support live streaming, and an enhanced Wi-Fi connection with increased bandwidth that allows for easy photo and video sharing on social media. Video monitors throughout the facility allow exhibitors to watch the action in the show rings in real time. Located about an hour from St. Louis, the Purina Event Center, which was custom built to support the dog fancy, opened in 2010.

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Upcoming Events

Check out upcoming Purina-sponsored show and sporting events at venues across the country. These events are great opportunities to meet dog enthusiasts, canine experts and Purina representatives who can answer questions about Purina Pro Plan dog food and Purina Pro Club.

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