

Endorsed by Vets, It Triggers Cancer, Dysplasia and More

Oddly, this single decision can place the odds in your pet's favor, or against it. Do what most vets recommend, and you greatly increase her risk of dysplasia and many kinds of cancer, including a 1 in 4 lifetime risk of bone cancer. Handle this hot potato with TLC.

Analysis by Dr. Karen Shaw Becker

STORY AT-A-GLANCE

- Dogs in the U.S. are routinely spayed or neutered between the ages of 4 and 9 months
- Over the last several years, a number of studies have been conducted on the effects of spay/neuter in large and giant breed dogs
- While spaying or neutering these dogs decreases or prevents reproductive organ disease, it increases the risk for other diseases, including obesity, musculoskeletal disorders and several types of canine cancer
- My preference is to perform a sterilization procedure that spares the ovaries or testes instead of a full spay or neuter, however, there are very few veterinarians in the U.S. who are trained to sterilize rather than desex
- If your large or giant breed dog absolutely must be spayed or neutered the conventional way, I recommend waiting until full musculoskeletal maturity has been reached, and in females, until after the first estrus cycle

Editor's Note: This article is a reprint. It was originally published January 11, 2017.

In the U.S., dogs are routinely spayed or neutered when they're between 4 and 9 months old. In the words of Dr. Clara Goh, surgical oncologist at Colorado State University's Veterinary Teaching Hospital, writing for Clinician's Brief:

"The decision to perform this procedure is often based on convention, habit or misconception of health benefits rather than on an evidence-based assessment of each patient."¹

Over the last several years, a number of small, breed-focused and primarily retrospective studies have been conducted on the effects of spay/neuter in large and giant breed dogs, including the Rottweiler and **Golden Retriever**.

Goh provides the following information to illustrate what the research has uncovered about the potential benefits and adverse effects of gonadectomy:

Condition	Effect of Spay on Female Large/Giant Breeds	Effect of Neuter on Male Large/Giant Breeds
Overall longevity	Mild increase	Mild increase
Obesity	Moderate increase	Moderate increase
Cranial cruciate ligament disease	Moderate increase*	Moderate increase*
Hip dysplasia	Mild increase*	Mild increase*
Mammary tumors	Marked decrease*	—
Uterine, ovarian and vaginal tumors	Prevents	—
Testicular tumors	—	Prevents
Perianal gland tumors	—	Marked decrease
Prostatic carcinoma	—	Prevents
Lymphoma	Mild increase	Mild increase*
Mast cell tumors	Mild increase	—
Hemangiosarcoma	Mild increase*	Mild increase
Osteosarcoma	Mild increase*	Mild increase*
Transitional cell carcinoma	Mild increase	Mild increase
Urinary sphincter mechanism incompetence	Moderate increase*	—
Cystitis	Mild increase*	—
Benign prostatic hyperplasia	—	Marked decrease
Perineal hernia	—	Moderate decrease

*Age at time of surgery may be important

To summarize the information in Goh's table, spaying or neutering large and giant breed dogs decreases or prevents most reproductive organ disease, as you would expect, since conventional desexing surgery removes some or all of those organs and the hormones they produce.

The diseases for which spayed or neutered dogs are at increased risk are, as you also might expect, some of the most common disorders seen in dogs today. They include obesity, cranial cruciate ligament (CCL) ruptures, hip dysplasia, several types of cancer, urine dribbling (incontinence) and cystitis (bladder inflammation).

Musculoskeletal Disorders in Desexed Large and Giant Breed Dogs

As Goh points out, removing a dog's ability to produce important hormones while his skeleton is still developing can result in delayed closure of the growth plates at the end of each long bone.

This can cause a dog's legs to grow longer than normal, as you can see in **this example** of two adult male Golden Retrievers. The big guy on the left is intact, with normal conformation for the breed. The leggier guy on the right was neutered at 5 months and has a quite noticeable longer-limbed conformation.

Sadly, even though the taller Golden on the right is certainly as handsome and fit-looking as the dog on the left, his longer limbs may put him a higher risk for orthopedic disease.

Labrador and Golden Retrievers neutered before 6 months of age develop one or more joint disorders at two to five times the rate of intact dogs.²

When it comes to problems with cranial cruciate ligaments, large breed dogs spayed or neutered at under 6 months of age have three times the risk for early life CCL injuries.³ Dogs desexed at any age have a two to three times higher incidence of CCL disease compared with intact dogs.^{4,5}

In a study of several hundred Golden Retrievers, none of the intact dogs had CCL disease; however, 5% of neutered males and 7.7% of spayed females who were desexed before they were a year-old developed CCL injuries.⁶

The body condition score was the same for all the dogs, which indicates that changes in the build of the desexed dogs was to blame.

Male Golden Retrievers neutered at under 1 year developed hip dysplasia at double the rate of intact males, and the disease also appeared earlier in the desexed dogs.⁷ Another study of 40 years of data collected on a range of different dogs desexed at a variety of ages showed a 17% increased risk of **hip dysplasia**.⁸

Cancers Linked to Desexing of Large and Giant Breeds

Studies have shown that intact large and giant breed dogs have lower risk for developing lymphoma than spayed or neutered dogs. Another risk factor for lymphoma is desexing before the age of 1.⁹ Spaying/neutering is also associated with a two to four times greater risk for mast cell tumors.¹⁰

In a study of Rottweilers, both males and females who were desexed before they were a year old had a 1-in-4 lifetime risk for bone cancer, and in general, spayed or neutered dogs were significantly more likely to develop the disease than intact Rotties.¹¹

Another study concluded that for the period 1980 through 1994, the risk for **bone cancer** in large breed, purebred dogs increased twofold for dogs that were spayed or neutered.¹² Desexed dogs also have a three times greater risk of developing transitional cell carcinoma of the bladder than intact dogs.^{13,14}

Food for Thought if You're Considering Spaying or Neutering Your Large or Giant Breed Dog

Over the years I've changed my view on spaying and neutering dogs, based not just on a mounting body of research, but also on the health challenges faced by so many of my canine patients after I desexed them. That's why my current approach is to work with each individual pet owner to make decisions that will provide the most health benefits for the dog.

Whenever possible, I prefer to leave dogs intact. However, this approach requires a highly responsible pet guardian who is fully committed to and capable of preventing the dog from mating (unless the owner is a responsible breeder and that's the goal).

It's important to note that I'm not advocating the adoption of intact shelter animals to people who may or may not be responsible pet owners. Shelter veterinarians don't have the time or resources to build a relationship with every adoptive family, so the animals in their care must be sterilized prior to adoption to prevent more litters of unwanted pets.

My second choice is to sterilize without desexing. This means performing a procedure that will prevent pregnancy while sparing the testes or ovaries so they can continue to produce hormones essential for the dog's health and well-being.

This typically involves a vasectomy for male dogs, and either a tubal ligation or modified spay for females. The modified spay removes the uterus while preserving the hormone-producing ovaries. It also eliminates the possibility of pyometra because the uterus is removed.

Rarely, older, intact male dogs develop moderate to severe benign prostatic hyperplasia (an enlarged prostate) that may be improved with conventional neutering. Generally speaking, mature intact dogs have had the benefit of a lifetime of sex hormone production, so the endocrine imbalances we see with spayed or neutered puppies don't occur when dogs are desexed in their later years.

Unfortunately, veterinary schools in the U.S. only teach full spays and neuters, so unless your own vet has obtained additional training in sterilization techniques that spare the ovaries or testicles (which is unlikely), you'll have only one option available to sterilize your pet.

In that case, my suggestion would be to wait until your dog has reached full musculoskeletal maturity, and if you have a female, I'd also wait until she's completed her first estrus cycle before scheduling the surgery.

Sources and References

[Clinician's Brief, August 2016](#)

¹ [Clinician's Brief, August 2016](#)

² [PLOS ONE, July 14, 2014](#)

³ [JAVMA. 2007 Dec 1;231\(11\):1688-91](#)

^{4,8} [JAVMA. 2008 Jun 15;232\(12\):1818-24](#)

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¹² [Vet J. 1998 Jul;156\(1\):31-9](#)

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¹⁴ [JVIM. 2003;17\(2\):136-144](#)
