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Study shines spotlight on neutering

Assumptions about a mainstay of companion animal practice are called into question

By R. Scott Nolen

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Earlier this year, a study out of the University of California-Davis showed higher rates of certain cancers and musculoskeletal disorders among neutered Golden Retrievers, compared with rates among sexually intact Goldens. The findings challenge what is essentially an article of faith within the U.S. veterinary profession: Thou shalt spay or castrate cats and dogs.



Photo by R. Scott Nolen

Unlike in many parts of Europe, where elective gonadectomy is seen as unethical and the procedure is rare, most owned cats and dogs in the United States are spayed or castrated before 1 year of age. “Spaying and neutering is the most common surgery performed in Banfield hospitals,” said Dr. Karen Faunt, vice president of medical quality for Banfield’s more than 830 hospitals.

Veterinarians and humane organizations alike support neutering as a population management tool that can also improve pet health and curb unwanted behaviors. Spayed cats and dogs, for example, are known to have lower incidences of mastitis; castrated dogs have a lower risk of developing prostate disease and are less likely to roam than are sexually intact dogs. Spay Day USA, World Spay Day, and the U.S. Postal Service’s 2002 “Neuter or spay” commemorative stamps have reinforced the importance of neutering pets.

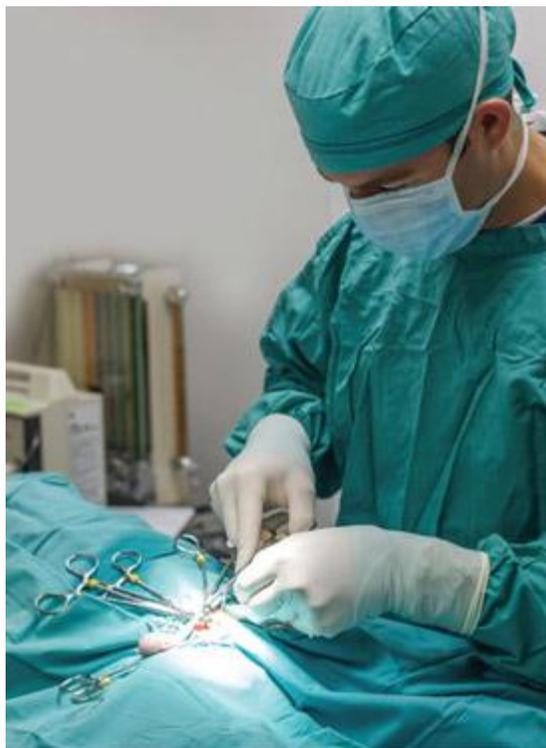
Belief in the advisability of spaying and neutering was called into question this past February when the online journal PLOS ONE published the UC-Davis study linking neutering to the increased occurrence of certain adverse health conditions in Golden Retrievers. While it isn’t the first study to challenge widely held assumptions about neutering, it garnered a great deal of attention, possibly because of the Golden Retriever’s standing as one of America’s most popular dog breeds.

Number crunching

As part of the study, UC-Davis researchers analyzed medical records for 759 Golden Retrievers treated at the Veterinary Medical Teaching Hospital for hip dysplasia, cranial cruciate ligament tear, lymphosarcoma, hemangiosarcoma, and mast cell tumor—conditions to which the breed is predisposed. The dogs were privately owned, were of both sexes, and ranged from 1 to 8 years of age. What researchers found was noteworthy (see *JAVMA*, [April 1, 2013](#)).

Of males castrated early—defined in this study as before 1 year of age—10 percent had hip dysplasia, double the

occurrence among sexually intact males. Cranial cruciate ligament tears were not diagnosed in any of the sexually intact males or females, but in the early age–neutered males and females, prevalences were 5 percent and 8 percent, respectively. Lymphosarcoma was diagnosed in almost 10 percent of males castrated early, three times the rate in sexually intact males.



Dr. Stephen Poduska of Harper Animal Hospital in Palatine, Ill., castrates an adult West Highland White Terrier. Neutering has been associated with longer life spans in cats and dogs, but there's growing evidence of a possible link between neutering and higher rates of certain diseases. (Photo by R. Scott Nolen)

Additionally, researchers found the percentage of females spayed at 1 year of age or later that developed hemangiosarcoma (about 7 percent) was more than four times the percentages of sexually intact and early age–neutered females that developed hemangiosarcoma. None of the sexually intact females developed mast cell tumors, but nearly 6 percent of females spayed at 1 year of age or later did.

“Understandably, we see plenty of push back, along with lots of compliments like ‘thank goodness someone is finally doing something about the issue, especially the very early neutering’,” acknowledged Dr. Benjamin L. Hart, the study's lead investigator and a distinguished professor emeritus at the UC-Davis School of Veterinary Medicine.

Dr. Ann F. Hubbs is chairwoman of the Golden Retriever Club of America's Health and Genetics Committee. The GRCA, comprising more than 4,500 members, has long been concerned with issues regarding the health effects and optimal timing of neutering. The club welcomes the findings of the UC-Davis study.

“Studies such as this may help owners and veterinarians make neutering decisions together that balance numerous factors and are tailored to the individual dog’s health, the owner’s goals, and the overall circumstances,” Dr. Hubbs said.

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and assistant dean of education, University of Minnesota
College of Veterinary Medicine*

Critics of the UC-Davis study claim a retrospective analysis won’t produce any meaningful insights into the complex physiological changes brought on by gonad removal. Others fault the study for being limited to Golden Retrievers and say the data cannot be extrapolated across dog populations. Still others insist the study only confirms what they had already suspected about the health risks of neutering.

“The interesting thing is that our paper did not report any new disease related to neutering,” Dr. Hart said. “The information has been around for several years but lumped breeds, genders, and times of neutering together. We focused on one breed that gets a lot of diseases, looking at neutering in different sexes and at the different ages of neutering.”

He explained that preliminary work at the UC-Davis Center for Companion Animal Health on Labrador Retrievers suggests that dogs of this breed are not as likely to see an increase in cancers or joint disorders associated with neutering as are Golden Retrievers.

Veterinarians, Dr. Hart said, have two concerns about delaying neutering. One is an increased risk of mammary cancers in females, and the other is an increased risk of problem behaviors, such as aggression, in males. With regard to mammary cancer, he pointed to a recent meta-analysis that concluded there is only a weak link, if any, between sexually intact females and an increase in the rate of mammary cancer.

Dr. Hart further noted that none of the 120 sexually intact females in their study reportedly developed mammary cancer and the two dogs that did have mammary cancer were spayed females. “The picture with regard to mammary cancer will undoubtedly vary among breeds,” he said.

“There is an erroneous feeling that neutering males before puberty is necessary to prevent some problem behaviors, such as urine marking in the home or aggression toward the owners,” Dr. Hart said. Research done at their center and cited in their paper shows that neutering males in adulthood, after the onset of problem behavior, is as effective in changing the behavior as neutering before puberty is in preventing the problems.

Mixed messages

The UC-Davis study on Golden Retrievers is part of a growing body of evidence indicating elective gonadectomy can adversely impact an animal’s health.

Numerous studies published in peer-reviewed scientific journals, including the *JAVMA*, have reported the health benefits neutering can impart. Spayed and castrated cats and dogs tend to live longer and are less susceptible to reproductive tract diseases and hormone-associated disorders than are those left sexually intact.

Throughout the past three decades, however, the same journals have also published data showing the opposite to be

true. Researchers have reported higher incidences of musculoskeletal and endocrinologic disorders, obesity, and urinary incontinence in neutered mixed-breed and pedigreed cats and dogs, compared with incidences in sexually intact animals.

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“We change animals when we spay and castrate them, both in good and bad ways,” explained Dr. Margaret V. Root, a professor of small animal theriogenology at the University of Minnesota College of Veterinary Medicine.

“There is little to help us understand cause and effect of surgery and disorders prevented or apparently promoted by this surgery. There also are few studies specifically addressing whether or not age at the time of surgery has an effect on development of problems.”

Dr. Root is a diplomate of the American College of Theriogenologists and has twice published literature reviews on the positive and negative health effects of neutering on dogs and cats, first in 2007 and most recently in 2012.

“There have been several studies published since then, including the Golden Retriever study out of UC-Davis, and findings from those studies do not refute what has already been reported,” she said.

JAVMA News contacted several pet health insurers to determine whether neutering is a factor for assessing premium costs. Four companies—Petplan Pet Insurance, Pets Best Insurance, ASPCA Pet Health Insurance, and VPI Pet Insurance—stated that neutering is not a consideration. Embrace Pet Insurance offers a 5 percent discount to insure pets that are spayed or castrated.

To date, research on the disadvantages of neutering isn't persuasive enough for Petplan Pet Insurance to include the procedure as a risk factor when assessing premiums, according to Dr. Jules Benson, the company's vice president of veterinary services. Petplan covers more than 100,000 pets in the U.S. and more than 1 million worldwide.

“Some of the data are obviously very compelling, and you can’t ignore that,” Dr. Benson said. “What is needed are long-term studies that then allow us to make the best, informed decisions.”

Crowd control

This September, Best Friends Animal Society released results of a national survey that revealed most Americans vastly underestimate how many cats and dogs are euthanized daily in U.S. animal shelters. Most respondents guessed fewer than 500; Best Friends puts the number at more than 9,000.

The American Society for the Prevention of Cruelty to Animals is one of the most widely recognized humane organizations working to remedy this crisis, in part by advocating for the neutering of all cats and dogs, except those that are part of a responsible breeding program or for which neutering isn’t medically viable.

Moreover, the ASPCA supports neutering animals as soon as they reach 2 months of age and weigh 2 pounds. The AVMA likewise endorses pediatric or “early-age” spay and neuter to manage dog and cat overpopulation, and advises veterinarians to use their best judgment in deciding at what age the surgery should be performed.

Dr. Jed Rogers, senior vice president of Animal Health Services for the ASPCA, acknowledged there is a lack of scientific evidence proving that neutering has helped reduce the number of unwanted cats and dogs. The consensus within the shelter community, however, is that neutering has contributed to a substantial decline. It is estimated that, some 30 years ago, upward of 70 million shelter animals were being euthanized annually. Today, that number is thought to have dropped to fewer than 5 million.

“People with knowledge of veterinary medicine and/or animal welfare will say it’s an easy concept to believe,” Dr. Rogers said.

Given the ASPCA’s intersecting interests in animal welfare and solving the dog and cat overpopulation problem, the organization stays apprised of new research on neutering, Dr. Rogers explained. “Over the past 10 years,” he said, “there’ve been probably 20 significant studies looking at both the benefits and the risks of spay-neuter.

“We know that an animal that has been spayed or neutered is less likely to be relinquished to shelters. We know that spay-neuter conveys health benefits with respect to certain types of cancers. There are some risks that we all know about, such as obesity and urinary incontinence in female dogs.”

While commending the UC-Davis study for offering new insights on the effects of neutering on the health of Golden Retrievers, Dr. Rogers said the findings are too limited in scope to spur a review of his organization’s policies and initiatives. “The increase in spay-neuter over the past 50 years has been driven by veterinarians and shelters. We’ve done that, and I’m proud of us for doing that,” he said. “This one study is not going to knock 50 years of thinking off course.”

A two-tiered approach

While the ASPCA is steadfast in its convictions, some veterinarians’ faith in neutering was shaken by the UC-Davis study. To help practitioners sort through the mixed messages, the Humane Society VMA this past September hosted a webinar summarizing the research on the health benefits and risks associated with neutering cats and dogs.

The webinar was presented by Dr. Philip A. Bushby, a professor of humane ethics and animal welfare at the Mississippi State University College of Veterinary Medicine, whose interest in dog and cat overpopulation was sparked while he was interning during the 1970s at the ASPCA’s Bergh Memorial Hospital in New York City.

“At that time, ASPCA did animal control for all five boroughs of the city. I was just shocked by the numbers of animals being euthanized every day in the shelters. That’s always lived with me,” Dr. Bushby recalled. He has since spent most of his career educating veterinary students about how they can help remedy dog and cat overpopulation.

The UC-Davis study created “a fair amount of buzz in the profession,” Dr. Bushby acknowledged, and has even caused some veterinarians to question whether the current approach to neutering is appropriate. What many people ignore, he says, is this key statement in the UC-Davis analysis: “An important point to make is that the results of this study, being breed-specific, with regard to the effects of early and late neutering cannot be extrapolated to other breeds, or dogs in general.”

“These data are real, the issue is there, but the numbers are real small,” Dr. Bushby said. “We know that spay-neuter increases the incidences of some tumors and some medical conditions. We know that. We know that spay-neuter decreases the incidences of some tumors and some medical conditions. We know that.”

“But before we, as a profession, make any major decision about spay-neuter, we should look at more numbers, and before we try to extrapolate these findings across all dogs, we should look at populations in general, not just one breed.”

Given the amount of knowledge on the health effects of spaying and castrating, Dr. Bushby believes the decision to neuter a cat or dog should be based, in part, on the animal’s ownership status. “My position on shelter animals is there is no reason to change anything. We should still be promoting spay-neuter, and we should still be promoting early-age spay-neuter because of the population dynamics involved,” he said.

Before neutering an owned animal, a veterinarian should take into account the pet’s breed and its genetic predisposition to particular diseases, Dr. Bushby said. “When you’re talking about the individual owned animal, if you’re dealing with a breed that is known to be predisposed to osteosarcoma, then you probably need to have that sit-down conversation with the owner so the owner can make a more informed decision,” he suggested.

Similar to Dr. Bushby, Dr. Root believes that, given the millions of unowned cats and dogs and the research on neutering, shelter animals and pets should be treated differently when it comes to spaying and castrating. Veterinarians, she added, owe it to their clients to make sure they understand the pros and cons of neutering so they can make the best choices for their pets.

“Everyone wants what is best for the animals. The problem is that what is best for an unowned animal may not be what is best for an owned animal, depending on the situation,” Dr. Root said.

“In the absence of other ways to prevent adopted animals from repopulating shelters with their offspring, shelters will continue to perform spay-castration surgery.”