

*Larry S. Katz, PhD
Associate Professor and Chair
Animal Sciences
Rutgers University
New Brunswick, NJ 08901*

INTRODUCTION

Dog owners in America are frequently advised to spay/neuter their dogs for health reasons. A number of health benefits are cited, yet evidence is usually not cited to support the alleged health benefits.

When discussing the health impacts of spay/neuter, health risks are often not mentioned. At times, some risks are mentioned, but the most severe risks usually are not. This article is an attempt to summarize the long-term health risks and benefits associated with spay/neuter in dogs that can be found in the veterinary medical literature. This article will not discuss the impact of spay/neuter on population control, or the impact of spay/neuter on behavior.

Nearly all of the health risks and benefits summarized in this article are findings from retrospective epidemiological research studies of dogs, which examine potential associations by looking backwards in time. A few are from prospective research studies, which examine potential associations by looking forward in time.

SUMMARY

An objective reading of the veterinary medical literature reveals a complex situation with respect to the long term health risks and benefits associated with spay/neuter in dogs. The evidence shows that spay/neuter correlates with both positive AND adverse health effects in dogs. It also suggests how much we really don't yet understand about this subject.

On balance, it appears that no compelling case can be made for neutering most male dogs, especially immature male dogs, in order to prevent future health problems. The number of health problems associated with neutering may exceed the associated health benefits in most cases.

On the positive side, neutering male dogs

- eliminates the small risk (probably <1%) of dying from testicular cancer
- reduces the risk of non-cancerous prostate disorders
- reduces the risk of perianal fistulas
- may possibly reduce the risk of diabetes (data inconclusive)

On the negative side, neutering male dogs

- if done before 1 year of age, significantly increases the risk of osteosarcoma (bone cancer); this is a common cancer in medium/large and larger breeds with a poor prognosis.
- increases the risk of cardiac hemangiosarcoma by a factor of 1.6
- triples the risk of hypothyroidism
- increases the risk of progressive geriatric cognitive impairment
- triples the risk of obesity, a common health problem in dogs with many associated health problems
- quadruples the small risk (<0.6%) of prostate cancer
- doubles the small risk (<1%) of urinary tract cancers
- increases the risk of orthopedic disorders
- increases the risk of adverse reactions to vaccinations

For female dogs, the situation is more complex. The number of health benefits associated with spaying may exceed the associated health problems in some (not all) cases. On balance, whether spaying improves the odds of overall good health or degrades them probably depends on the age of the female dog and the relative risk of various diseases in the different breeds.

On the positive side, spaying female dogs

- if done before 2.5 years of age, greatly reduces the risk of mammary tumors, the most common malignant tumors in female dogs
- nearly eliminates the risk of pyometra, which otherwise would affect about 23% of intact female dogs; pyometra kills about 1% of intact female dogs
- reduces the risk of perianal fistulas
- removes the very small risk ($\leq 0.5\%$) from uterine, cervical, and ovarian tumors

On the negative side, spaying female dogs

- if done before 1 year of age, significantly increases the risk of osteosarcoma (bone cancer); this is a common cancer in larger breeds with a poor prognosis
- increases the risk of splenic hemangiosarcoma by a factor of 2.2 and cardiac hemangiosarcoma by a factor of >5 ; this is a common cancer and major cause of death in some breeds • triples the risk of hypothyroidism
- increases the risk of obesity by a factor of 1.6-2, a common health problem in dogs with many associated health problems
- causes urinary “spay incontinence” in 4-20% of female dogs
- increases the risk of persistent or recurring urinary tract infections by a factor of 3-4
- increases the risk of recessed vulva, vaginal dermatitis, and vaginitis, especially for female dogs spayed before puberty
- doubles the small risk ($<1\%$) of urinary tract tumors
- increases the risk of orthopedic disorders
- increases the risk of adverse reactions to vaccinations

One thing is clear – much of the spay/neuter information that is available to the public is unbalanced and contains claims that are exaggerated or unsupported by evidence. Rather than helping to educate pet owners, much of it has contributed to common misunderstandings about the health risks and benefits associated of spay/neuter in dogs.

The traditional spay/neuter age of six months as well as the modern practice of pediatric spay/neuter appear to predispose dogs to health risks that could otherwise be avoided by waiting until the dog is physically mature, or perhaps in the case of many male dogs, foregoing it altogether unless medically necessary.

The balance of long-term health risks and benefits of spay/neuter will vary from one dog to the next. Breed, age, and gender are variables that must be taken into consideration in conjunction with non-medical factors for each individual dog. Across-the-board recommendations for all pet dogs do not appear to be supportable from findings in the veterinary medical literature.