

How to Help Protect Your Pet From Avoidable Tumors

While the jury is out as to whether early spaying reduces a dog's risk of developing mammary tumors, there's much you can do to help your pet stay healthy. Avoiding these often hidden estrogen-mimicking chemicals can help protect against high estrogen levels that can fuel tumors.

Analysis by Dr. Karen Shaw Becker

STORY AT-A-GLANCE

- A 2019 Penn Vet study raised as-yet unanswered questions about the role of spaying and estrogen levels in dogs who develop mammary tumors
- Estrogen appears to drive mammary cancer development; it also appears to have a protective effect with regard to metastasis and survival times
- The ability to effectively metabolize estrogen is essential in preventing certain cancers, including mammary tumors; estrogen-mimicking chemicals in the environment — xenoestrogens — can be the culprit in dogs with excessively high serum estrogen levels
- There are many things pet parents can do to limit their dog's exposure to xenoestrogens and reduce the risk for mammary cancer

It's generally accepted as fact that female dogs **spayed at a young age** have a reduced risk of developing mammary tumors — the equivalent of breast cancer in humans.

However, it's certainly worth noting that the results of a now 10-year-old study — a systematic review conducted by veterinary researchers in the U.K. — **did not validate** the theory that early spaying protects female dogs from mammary neoplasia.¹

Unfortunately, this study, and the questions it raises, has received very little attention, but does highlight what emerging research is now discovering: canine mammary tumors have hormone interplays potentially as complex as human mammary cancers.

New Study Raises Questions About Mammary Cancer

Since spaying involves the removal of the ovaries, it also removes most of the body's ability to produce estrogen. For this reason, estrogen is widely assumed to play a role in the development of canine mammary tumors. But a study by researchers at the University of Pennsylvania's School of Veterinary Medicine suggests the effects of estrogen on cancer risk in dogs aren't as clear-cut as originally thought.²

Interestingly, the study found that while spaying reduces dogs' risk of developing mammary cancer, it may increase the risk of more aggressive cancers. In addition, the researchers discovered that in spayed dogs with mammary tumors, higher serum estrogen levels were actually protective in terms of delayed metastasis and improved survival

times.

*"Dogs that remain intact and have their ovaries develop many more mammary tumors than dogs that were spayed, so removing that source of estrogen does have a protective effect," says Karin U. Sorenmo, a veterinary oncologist at Penn Vet and senior author on the study, in a Penn Today news release. "Estrogen does seem to drive mammary cancer development. But what it does for progression to metastasis — that I think is more complicated."*³

Estrogen May Play Opposing Roles in Cancer

For the study, the Penn Vet research team evaluated 159 dogs with mammary cancer, 130 who were spayed for purposes of the study, and 29 who were left intact. The researchers removed the dogs' tumors and gathered data on serum estrogen levels, tumor type, disease grade and stage, time to metastasis, and survival time.

They discovered that despite the link between estrogen and an elevated risk of developing mammary tumors, higher estrogen levels seemed to also help prevent some of the most dangerous aspects of the cancer. From the Penn Today news release:

"Unexpectedly, when dogs were spayed at the same time their tumors were removed, those with estrogen receptor-positive tumors that had higher serum estrogen took longer to develop metastatic disease and survived longer than dogs with lower estrogen levels, confirming that these tumors depended on estrogen for progression."

Sorenmo's theory is that in these instances, the effect of estrogen may be nuanced. "It drives the cancer, but it also seems to control or modulate it, reining it in," she says, because most of the dogs with high estrogen levels had lower-grade and estrogen receptor-positive tumors, which made them susceptible to hormonal deprivation by spaying.

The researchers noted that the protective effect of estrogen was also pronounced in dogs with estrogen-receptor negative mammary tumors. These are higher risk cancers, and high estrogen levels were associated with delayed metastasis, or the absence of metastasis.

Additionally, after mammary tumor surgery, dogs with low estrogen levels had a significantly increased risk for other aggressive, fatal tumors that were not mammary related, such as **hemangiosarcoma**.

As Sorenmo notes, some of the findings in women with breast cancer are also contradictory. For example, while higher serum estrogen levels in survivors of breast cancer are linked to higher recurrence rates, many breast cancers develop immediately following menopause, when estrogen levels plummet. So, it's possible estrogen plays a more complex role in human cancer risk as well.

"I think this study opens some really complicated questions," Sorenmo says. "If we start dissecting exactly what estrogen is doing, what genes or immune cells it's interacting with, maybe we could harness the power of estrogen to be more clever in our treatment strategies."

Metabolization of Estrogen Is Key in Preventing Certain Cancers

In order to address why dogs develop mammary tumors, we must identify why their immune systems failed and allowed cancer cells to proliferate. It's also critical to evaluate the estrogen-mimicking chemical load in their environment.

Even animals no longer producing their own estrogen after being spayed or neutered can be exposed to overwhelming amounts of xenoestrogens (estrogen mimicking chemicals) in the environment. I've seen many patients over the years with wildly unbalanced endocrine systems, including male dogs with estrogen levels higher than what is normal for intact females.

When I find mammary tumors in a dog, I immediately measure the sex hormone levels. If estrogen is elevated in desexed animals, after removing the tumors I institute a protocol including DIM (diindolylmethane) and high-lignan flax hulls, which may help to naturally reduce estrogen levels.⁴

DIM and flax hulls (not flaxseeds or flaxseed oil) have been shown to promote beneficial estrogen metabolism in both males and females. The body's ability to effectively metabolize estrogen is an important component in the prevention of certain cancers, in particular breast cancer.⁵

Dietary adjustments, including the elimination of all estrogenic foods (e.g., soy and yams) and highly processed foods created via the extrusion process (kibble) is important because the manufacture of kibble creates **carcinogenic byproducts**.

Feeding a fresh, **ketogenic**, high-fat, no-carb (starch-free), nutritionally balanced and species-appropriate diet is also part of the protocol, along with beneficial immune-support supplements. Broccoli sprouts can help metabolize xenoestrogens from environmental sources and is a food I recommend for all mammary cancer patients.

Thankfully there are a growing number of integrative veterinary oncologists popping up around the globe who can work with veterinary surgeons and local integrative veterinarians to customize treatment plans to achieve maximum benefits with the fewest possible side effects.

Sources of Xenoestrogens

In my opinion, exposure to xenoestrogens — chemicals that mimic the hormone estrogen — plays a significant role in elevated estrogen levels in dogs. Examples of xenoestrogens include:

- Atrazine (weed killer)
- Heptachlor (restricted insecticide)
- 4-Methylbenzylidene camphor (4-MBC) (found in sunscreen lotions)
- Lindane, hexachlorocyclohexane (restricted insecticide)
- Butylated hydroxyanisole (BHA) (food preservative)
- Methoxychlor (banned insecticide in U.S.)
- **Bisphenol A** (used to make plastics)
- Nonylphenol and derivatives (laboratory detergents; pesticides)
- Dichlorodiphenyldichloroethylene (DDT)
- Pentachlorophenol (restricted biocide in U.S.; wood preservative)
- Dieldrin (banned insecticide)
- Polychlorinated biphenyls (PCBs)

- DDT (banned insecticide in the U.S. but not other countries)
- Parabens (lotions)
- Endosulfan (banned insecticide in U.S.)
- Phthalates (used to make plastics)
- Erythrosine (FD&C Red No. 3)
- DEHP (found in PVC)
- Ethinylestradiol (oral contraceptive)
- Propyl gallate (used to preserve oils and fats)

The problem with this list is that these chemicals often aren't plainly labeled as such in many products found around the house. For instance, plug-ins, car fresheners, scented candles, room sprays and gel air fresheners are loaded with chemicals on this list, but manufacturers aren't required to list them on product labels.

Endocrine disruptors, which damage your dog's hormonal axis, including estrogen balance, are also found on many fabrics treated with **flame-retardant chemicals** (dog beds, carpets, couches, draperies).

Another endocrine disruptor is BPA, which is found in the lining of canned dog food containers and plastic food and water bowls, not to mention cleaning supplies that instruct you to call poison control if ingested. Always remember that any product used in your house has the potential to end up inside your pet.

It's also important to keep in mind that pesticides and chemicals banned in the U.S. still show up on and in products imported from other countries.

12 Ways to Reduce Your Pet's Exposure to Xenoestrogens

To reduce your dog's exposure to these estrogen-mimicking compounds, and thereby potentially lower the risk of mammary cancer:

1. Use stainless steel, glass, or ceramic food and water bowls
2. Avoid plastic storage containers for pet food or water
3. Don't microwave pet food in plastic containers
4. Don't use non-stick cookware if you cook food for your pet
5. Avoid using cling wrap that contains DEHA
6. Avoid pet foods containing soy, the preservatives BHA and BHT, and the food dye FD&C Red No. #3
7. Use natural pest control around your home and yard
8. Use alternatives to chemical flea/tick repellents
9. Use all-natural, **nontoxic cleaning supplies**
10. Buy organic dog beds
11. Remove fluoride and chlorine from drinking water
12. Don't buy canned food unless it's labeled BPA-free

Sources and References

[The Wildest July 20, 2021](#)

¹ [Beauvais, W. et al. \(2012\) Journal of Small Animal Practice, 53: 314-322](#)

² [Sorenmo K.U. et al. \(2019\) PLoS ONE 14\(10\): e0224504](#)

³ [Penn Today Media Release, November 1, 2019](#)

⁴ [Silver Bulletin](#)

⁵ [Molecular Medicine, 2007 Jan-Feb; 13\(1-2\): 69-78](#)
