

DOG DESEXING

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THE
FOREVER
DOG





“Every surgery that removes a body part has a consequence. The question is: are you fully aware of the irreversible consequences before making the decision to operate.”

-Jack Oliver ,Veterinary Endocrinologist

In the last four decades, the practice of spaying female dogs and castrating males has greatly increased in North America. The current estimate is 83 percent of all American dogs are neutered and, increasingly, neutering is being performed prior to 6 months of age as this is being advocated by many veterinarians and animal activists.

I was taught in vet school that all responsible pet owners should spay and neuter as a means of pet population control, for the prevention of mammary gland and prostate cancers, and to prevent and reduce aggressive male behavior. This societal practice in the U.S. continues to contrast with the general attitudes in many European countries, where neutering is commonly avoided and not promoted by animal health authorities.

Let me clarify my use of the term “desexed;” I’m referring to the traditional surgical technique of removing all sex hormone secreting tissues in a pet’s body (spaying and neutering). This is different from “sterilization” which refers to surgically rendering an animal incapable of reproducing, but still capable of producing sex hormones.

When I went to vet school (25 years ago), they told us of only a few known side effects from desexing, including a higher risk of bladder infections (UTI’s), urinary incontinence (dribbling urine), and a few possible metabolic effects that have now been definitively linked, including decreased metabolic function, resulting in increased weight gain. We know there are many more permanent side effects now, including aggression and other **behavioral changes.**

Because of the 10 years I spent working as a Euthanasia Technician at our local kill shelter prior to vet school, I couldn't have agreed more with what I was taught in vet school about desexing animals prior to 6 months of age; the sooner dogs were desexed the better, my opinion. It didn't cross my mind back then that there could be any negative side effects from removing all sex hormones prior to the body completing development or going through puberty. The problem was my veterinary practice was filled with patients exhibiting symptoms I couldn't explain, and I felt compelled to investigate what other researchers were discovering about the long-term consequences of spaying and neutering.

The **Vizsla study** highlighted how desexing affects every aspect of wellbeing. Results from 2500 Vizslas showed these dogs were at a significant increased risk for cancer (mast cell, lymphoma, hemangiosarcoma) compared to their intact counterparts, and the younger the age of desexing, the earlier the diagnosis of cancer. Vizslas desexed before 6 months of age had significant increase of behavioral disorders including separation anxiety, noise phobia, timidity, excitability, submissive urination, hyperactivity, and/or fear biting. All desexed animals were at a greater risk of thunderstorm anxiety compared to intact animals.

The **Golden Retriever study** demonstrated a 100% increase in the rate of hip dysplasia in male Goldens neutered before 12 months of age, three times greater risk of lymphoma in early-neutered males, and four times greater risk of hemangiosarcoma in early-spayed females.

A **study** utilizing the Veterinary Medical Database of over 40,000 dogs found that desexed males and females were more likely to die of cancer than intact dogs, especially of bone cancer, lymphoma and mast cell tumors.

Pertaining to the musculoskeletal effects of desexing, Cornell University found dogs desexed at an early age were more prone to **hip dysplasia** and **several studies** demonstrate an increased risk of **knee ligament ruptures**.

Metabolic and immunologic wellbeing can also be compromised by early spay/neuter, including an increased risk of **hypothyroidism**. Desexing increases the risks of **adverse reactions** to vaccines and **infectious diseases** are more common in dogs that are desexed at less than 24 weeks of age.



I found lots of research pertaining to desexing and the increased risks of cancer, including **Osteosarcoma (OSA) in several breeds** having a 2-fold increase in neutered dogs compared to intact dogs. This **study** shows Cardiac hemangiosarcoma (HSA) in spayed females was four times greater than that of intact females. Rottweilers neutered prior to 1 year of age were associated with an increased occurrence of bone cancer 3–4 times that of intact dogs, according to this **research**. Spayed females had a **4 times greater risk of mast cell tumors** (MCT) compared to intact females and **splenic hemangiosarcoma** was found at rates 2 times greater than that of intact females. Further, I was taught in vet school that neutering prevents prostate cancer, but new science clearly shows just the opposite: neutering dogs increases their risk of prostate cancer **four-fold**.

The most frequently mentioned advantage of early spaying of female dogs is protection against mammary cancer, however, a recent meta-analysis of published studies found the evidence linking spaying to a reduced risk of mammary cancer is weak, with the British Small Animal Veterinary Association **article** concluding “evidence that neutering reduces the risk of mammary neoplasia, and the evidence that age at neutering has an effect, are judged to be weak and are not a sound basis for firm recommendations.”

Desexing also affects **behavior**, with thunderstorm anxiety, separation anxiety and noise phobia risks all increasing. Neutering male dogs has demonstrated to **not be an effective treatment** for aggression, with one **research group** finding spayed females were more aggressive than intact females. Lastly, it appears desexing speeds up age-related **cognitive decline**.

In the early 2000's I spent several years apologizing to my clients for making them desex their dogs because of my medical recommendations (that turned out to be wrong). I explained that as research emerges, we (as a profession) must learn to alter our recommendations and be willing to change our surgical approach. This means finding more healthful ways to prevent unwanted pregnancies without compromising physical wellbeing.



Some **non-surgical sterilization options** exist that render dogs sterile and unable to reproduce. Alternatives for females include tubal ligation (not my favorite, because pyometra can still occur), or hysterectomy (also called Ovary Sparing Spay) and involves removing the uterus (so no pyometra can occur). By removing the uterus and leaving the ovaries in your dog's body her hormonal axis remains intact, but she is unable to get pregnant. You can connect with other pet parents that have an interest in these techniques or have experience with them by joining this **Facebook group**.

Here's a link you can follow to find a vet in your area that performs these procedures, and a step-by-step guide on how to do them (if you're a vet):

<https://www.parsemus.org/projects/ovary-sparing-spay/>

The Endocrine Web

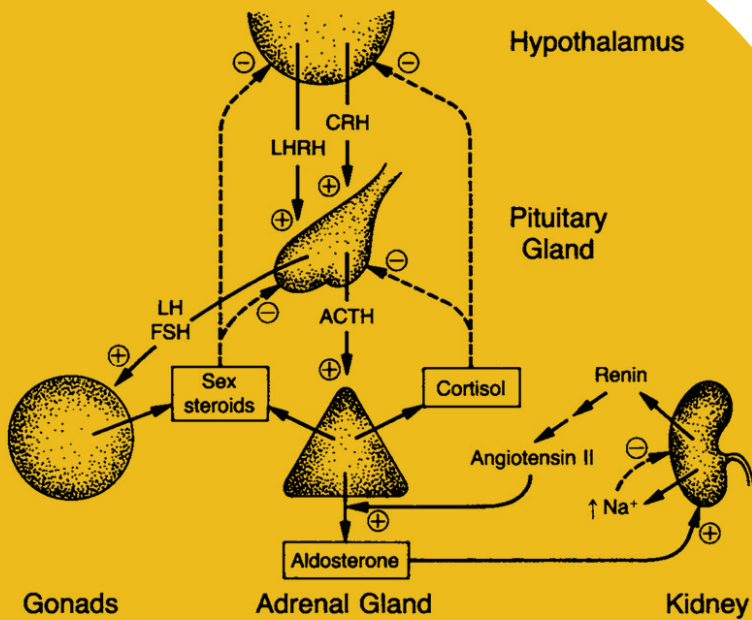
Like any web, when you pull on any aspect of your dog's hormonal axis, it affects other hormones. So, of course, when we remove all sex hormones (often times when dogs are still babies), there will be a permanent shift in your dog's hormonal axis...how can there not be?

I've had several vets say to me "what does it matter? There's nothing you can do about it anyway." And that's what separates Functional Medicine Vets from traditional vets; there's A LOT you can do about it, including changing the way we sterilize dogs.



The good news is cats appear to be off the hook regarding these lifelong side effects from desexing. Because cats have entirely different reproductive patterns (they are "induced ovulators"), traditional spay and neuter techniques do not appear to cause long-term complications (lucky cats).

It's also important to note I've met many dogs who have reached their geriatric years and have no visible complications from their castration procedures, so there's no reason to go looking for issues if your dog is desexed and thriving. But...if your dog is desexed and you've noticed physical or behavioral changes, or your dog's bloodwork shows possible adrenal issues (a climbing alkaline phosphatase--ALP--is a first clue) it is worth investigating to see if your dog's hormonal axis shift could be a part of the problem.



Without canine ovaries or testicles, there is no natural hormonal feedback mechanism in place so Luteinizing Hormone (LH) continues to be produced in excessive amounts by the pituitary gland. You can learn about the implications of high LH levels in dogs without gonads [here](#), but they include obesity, urinary incontinence, urinary calculi, diabetes mellitus, hypothyroidism, hip dysplasia, cranial cruciate ligament rupture, aggressive and fearful behavior, cognitive dysfunction syndrome, prostate adenocarcinoma and transitional cell adenocarcinoma (bladder cancer).

Excessive LH is just one of the mechanisms of action creating metabolic chaos in your desexed dog's body. A condition in which the adrenal glands produce abnormally high levels of sex hormones (but not abnormally high levels of cortisol) is called Atypical Cushing's Disease. Here's what my endocrine mentor, Dr. Jack Oliver, wrote about this syndrome:

The Clinical Endocrinology Service at the University of Tennessee utilizes steroid hormone profiling in the diagnosis of adrenal disease. Many of the cases received have had preliminary diagnostic workups with either ACTH stimulation or low dose dexamethasone suppression testing that has been negative, but signs of Cushing's disease persist. Many of these atypical Cushing's-like cases will have abnormal levels of adrenal intermediate steroids and sex hormones. Included in the atypical cases are a considerable number of dogs that have hyperestrinism (elevated estradiol levels), with and without increased levels of other steroids. The dogs with hyperestrinism typically present with some or all of the following clinical signs: "Cushingoid" appearance, presence of chronically elevated levels (usually extremely elevated) of serum alkaline phosphatase, hepatomegaly, steroid hepatopathy on biopsy, PU/PD, dilute urine, panting, haircoat problems and skin biopsies that indicate presence of an endocrinopathy. The talk will focus on case presentations that associate clinical signs presented by dogs with primary hyperestrinism (elevated serum estradiol levels), including the association of high estradiol with increased alkaline phosphatase, and the fact that sex steroids can cause elevated cortisol/creatinine ratios.

What Dr. Oliver is saying is that dogs with excessive estrogen (which comes about as a compensatory change after neutering) can end up with lots of Cushing's-like symptoms, but not have true Cushing's disease. Dr. Suzanne Valente documented her journey navigating this completely confusing syndrome, and discusses her dog's unique treatment protocol, via a blog that's worth reading:

<https://healthyandhappydog.wordpress.com/>

Symptoms of Atypical Cushing's Disease include increased thirst and urination, thin haircoat or baldness, poor skin condition, immunosuppression (leading to chronic infections), and potentially behavior changes (anxiety and aggression being the most common). On bloodwork, elevated ALP (alkaline phosphatase) is very common, but is not adrenal-specific and it can also be an indicator of bone, gallbladder or liver dysfunction, so a good next step, if your dog's ALP is elevated, is to ask for a ciALP, or Cortisol-Induced ALP (which tells us what % of the elevation is from cortisol, the stress hormone secreted by your dog's adrenal glands). This test can be easily added on by having your vet call the lab and ask for it, if the ALP turns out to be high on the routine bloodwork.

If ciALP is elevated and your dog has any of the above symptoms, your vet can verify your dog is producing excess cortisol by having you catch the first urine of the morning and doing a Urine Cortisol to Creatinine Ratio test (UCC). If your dog's urine contains excessive cortisol, your dog's adrenal glands are working overtime.

Running a baseline or pre and post ACTH Adrenal Panel through the Clinical Endocrinology Service at the College of Veterinary Medicine at the University of Tennessee is another way to determine low or high cortisol, and also provides important information about other hormones that could be unbalanced.

Adrenal stress affects the HAP (Hypothalamic-Adrenal-Pituitary) axis, which also controls thyroid function. Many desexed dogs have suboptimal thyroid function. "Suboptimal" means not clinically low, but less-than-ideal levels. If your dog's thyroid results are not in the median range (middle of normal), you can also work on supporting healthy thyroid balance (see below).





In humans, low thyroid function has been linked to insulin resistance. I have seen many patients with low thyroid levels also have concurrent elevated fasting blood glucose. In veterinary medicine, it's accepted that the higher the level of glucocorticoids or cortisol in the body, the higher the level of blood glucose, which can lead to insulin resistance and Type 2 diabetes. I will check an A1C test on patients that are persistently hyperglycemic to determine their diabetic risk. Transitioning off of highly processed food and onto a low carb, fresh food diet can be the difference between diabetes developing or not in these high-risk dogs.

Elevated cortisol can also predispose dogs to pancreatitis, so supplementing with digestive enzymes and maintaining ideal body weight and muscle mass is also very important. Unfortunately, it has been my experience that Atypical Cushing's Disease does, on occasion, morph into traditional Cushing's Disease. If baseline cortisol levels become worse despite adrenal management protocols, testing for Cushing's Disease will be necessary.

IN SUMMARY:

- **If sterilization is required, look for a vet that can perform a vasectomy or OSS**
- **If your dog has any of the symptoms discussed, completing further diagnostics will guide your functional medicine veterinarian on what support protocols will be beneficial for your dog**
- **All dogs are unique, so a customized protocol, based on your dog's needs, is always the best medicine**