To Neuter, Or Not, and Our Lack of Omnipotence.
Part I of Three Parts.

Suzanne Wille

Ever feel a bit helpless? I do, especially when I don't know all the options available to me in the service of taking care of our TTs. At times I hear others echoing similar sentiments of impotence. Still we trudge on because we TT advocates love our canine kids and that's not going to change. What does seem to be constantly changing is the knowledge of how to care for them, train them, feed them and how to prevent and treat disease. Lack of clarity isn't helped when one considers the circularity of health, nutrition and behavioral connects.

Still, we do everything we can to protect our cuddle bunnies, including decisions regarding whether to, or not, neuter. We listen to our vets who encourage some of us at each wellness check to neuter our TT as a means of reducing the risks of mammary and testicular cancers, and as prevention of pyometra. We listen to trainers; many of whom advice neutering to reduce different forms of dog aggression, and as a means of reducing scheduling conflicts around performance trial events and training sessions. To triple check things out (to make certain we're doing the so called 'right thing' for our canine kids) we go to contemporary medical researchers who tell us that some of the advice given to us in the past is now considered to be obsolete, and possibly dangerous, but which led us in the past to unknowingly make decisions that may have put our kids at increased risk for other possible health problems. In the case of neutering, these problems include (*but are not limited to*) negative reactions to vaccines, hip dysplasia, osteosarcoma, cardiac and splenic hemangiosarcoma, hypothyroidism, prostate cancer, cranial cruciate ligament tears (1), lymphosarcoma, mast cell tumors (females only), increase of more severe geriatric cognitive impairment (2), and urinary incontinence and urinary tract infections that can result in kidney infections and damage then possible death if we neuter. This isn't even a complete list. In addition, newer research informs us that many of the behavioral benefits once espoused regarding spaying / neutering are not quite right, and that training may be a better option than surgery.

We feel guilty and are scared to death for our little people because, darn it, we're not omnipotent. Then to top it off, as we travel the explosive informational highway we're told that some breeds are at greater risks than others for certain possible negative effects, and literature is not available today as to breed specific risks for the Tibetan Terrier.

Current research has also informed us that the method used in traditional neutering (complete removal of the uterus and ovaries in females and the testes in males) has put our kids at additional surgical risks (5)(6) due to the trauma done to the tissues by the invasive traditional method. Research has disclosed that the trauma may not even have been immediately apparent, but may have required an additional surgery.

This simmering pot of confusion is brought to a rolling boil by important Rottweiler (3)(4) studies which posit that neutering may grant greater longevity. What? Doesn't the list of greater risk of life threatening diseases *and* increased longevity sound a bit contradictory, at least on the surface?

Thank goodness we find that some consistency appears across many well constructed peer reviewed studies. Such as, that the younger the dog at the time of the spay / neuter, the higher the risk for possible negative effects over time; that neutering at an older age (e.g., 6-8 years and beyond) is harder on the dog; and, that the health status of a dog is an important variable to be considered in regard to which method may be the most protective of our loved ones. Finally, in our search for information regarding how to protect our enigmatic and beguiling little people we are cautioned by respected researchers that many of the most cited studies employed research subjects from medium to large sized breeds, of which the TT is neither. Therefore, the findings may or may not apply to all breeds. Also, findings may not apply to all dogs within the same breed.

Before we go any further we must ask ourselves if our legislators, vets and trainers historically meant to cause harm by advocating for early neutering or use of the traditional method? My answer is "absolutely not" because our legislators wanted to reduce the number of homeless pets in shelters and to secure the public's well being. Our vets take oaths to do no harm and they use the method taught to them by their veterinary schools who in the past only taught the traditional technique (with the traditional rationals) while their students received their practical clinical training in over crowded animal shelters. Our trainers just try to help solve behavioral problems that they believe are under hormonal influence.

Currently, a few more progressive schools are investing in the research and development of less invasive effective alternative methods for neutering and sterilization. They are asking the questions if one should neuter, for what reason, and at what age within the context of a particular dog's health issues. The students are competing hard for entry into these more progressive schools of

veterinary medicine. Our trainers of today are adding many new tools and learning theories to their training repertoires.

In our search for answers regarding the issues related to neutering, we learn that there is no one perfect answer, but that there is some hope of finding a 'best possible' answer for each unique dog that better fits the needs of each family. Our hope is born from the development of new safer and effective methods of sterilization. Beyond all else, now or in the future, our hope is dependent upon if we receive *full disclosure* of the pros and cons of each neutering option from our vets, and through our own search of alternative options.

This is a three part series on the issue of neutering our TT lasses and lads. In Part II we will look at different options currently available for our females, as well as some of the options that are still being developed, but which are not quit ready. Part III will take a look at possible options for our guys. Part III will also list some resources you may consider before making final decisions; decisions that are your's, and only your's, to make.

In the meantime, let's give a huge 'shout out' and applause to the progressive schools of veterinary medicine, the DVM Board Certified Behavioralist's, the progressive legislators who are strong enough to do a 'double take' on past legislation, and to the vets who go to the time and expense for continued education and Board Certifications.

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To Neuter, Or Not, and Our Lack of Omnipotence
Part II of Three Parts

Suzanne Wille
Kirsten Stewart (copy editor)

In Part I we looked at the controversy and confusion surrounding the issue of neutering. We described some of the health risks associated with the practice and its traditional applications, which has fueled dog owners' feelings of confusion and helplessness. We hoped the discussion wouldn't cause a war within our breed even though a war over the neutering issue has been boiling out there in the public, and in research circles, for some time. The intent of this series is not to stir controversy, but to inform. We promised to cover neutering options for our girls in Part II.

Following is a summary of available neutering options for our girls. There is no one-size fits all strategy; each comes with risk and benefits. Further complicating our decisions as dog owners is the ever-evolving field of veterinary medicine and promise of better, less invasive methods.

A note: Before we get started allow me to mention that four studies (published between 1991 and 1996) were summarized by a third party who notes that since removing the ovaries in a female removes the production of progesterone which can elevate serotonin, a calming hormone, "any observable forms of aggression may be increased after the removal (of ovaries)." (1) (2) (3) (4) Also the following surgical options do not differentiate the use of lasers and scalpels during the procedures because this author views them as procedural tools, versus methods for spaying / neutering and sterilization. According to Animal Hospital of Unionville (2013) both tools are used for cutting to make incisions, both are painful and require sutures, anesthesia and post-op medications. Because the laser cauterizes blood vessels as it cuts, there is a reduction of blood flow during the procedure, which may be helpful for the surgeon. Laser surgery requires more time for recovery and is usually more expensive.

Laparoscopic Ovariectomy
This procedure refers to removal of the ovaries while leaving the uterus intact. There is consensus in the literature that it provides significant pain reduction because the ovaries are not literally "torn out" like in the traditional method; it requires smaller incisions, and it causes less bruising. A faster recovery time,

approximately three days, is claimed. Because the ovaries, which produce progesterone, are removed there is significantly reduced risk of pyometra (uterine infection) even though the more rare stump pyometra may still occur.

There are downsides. Because progesterone production ceases, many health risk issues associated with the traditional method remain in force, and it is still considered an invasive procedure. Other downsides are that the equipment needed to perform the procedure is expensive and requires specialized training that is not offered by all vet schools. As such, finding a qualified and experienced vet may be a bit of a challenge and tends to be pricier.

(Note: I've read that beginning and advanced courses can be found at The University of Georgia, Colorado State University and Oregon State University's College of Veterinary Medicine. You might consult with these schools, and search for others, in the service of finding a vet trained in the procedure should this be your procedure of choice.]

Ovary-Sparing Spay

This procedure involves removing the uterus, cervix and a small part of the cranial portion of the vagina while leaving the ovaries intact. The procedure was developed by Michelle Kutzler, DVM, Diplomate of the American College of Theriogenologists, PhD (physiology) from Cornell University and was first published in the 1972. She is located in Oregon. Kutzler explains in a You Tube interview with Dr. Becker that because the ovaries remain intact, beneficial progesterone production continues.

There are downsides. According to Katzler, females with ovaries continue to go through estrus cycles, without discharge, to secrete pheromones that will attract males and they may attempt to mate. The latter should be discouraged as a means to prevent trauma to her remaining vaginal tissues. Other downsides include: difficulty finding a vet who is trained and experienced in the procedure; the degree of invasiveness, which is similar to the traditional technique; and Dr. Kutzler believes there is more research evidence available today to support its use in large breeds than exists for small breeds. Our TTs may be large dogs in smaller bodies but they are still medium-to-small sized dogs. (For a list of veterinarians who offer this technique go to: www.paremusfoundation.org/ovary-sparing-spay/ .

Tubal Ligation

Tubal ligation in dogs is the same procedure that is used in humans. It requires small incisions to cut or tie-off the fallopian tubes, leaving the ovaries and uterus intact. As such, it uses smaller incisions, is less invasive and protects normal hormonal production and immunology. There is less pain and a speeder recovery. The procedure is often done around 6 weeks of age, but can be performed at any age after four weeks. The procedure requires less time to perform. If the owner desires, complete de-sexing can be done later in life. It is usually less expensive.

There are downsides. Females continue to experience estrus and to be attractive to males. In rare cases the reattachment of the fallopian tubes may occur: thereby, making conception possible. Unfortunately, I'm unable to quote a rate of occurrence for canines, but the rate is approximately 5/1000 in humans (2001).

Oral Contraception

The pill for dogs, i.e., mibolerone, is an oral androgenic steroid that is used to suppress estrus and must be given for 30 days before entering estrus. It is FDA approved. According to an article on pet education.com, it is considered to be about 90 percent effective; has been used to treat false pregnancies; should not be used in the context of liver and kidney disease, or in patients with androgen-dependent cancers. It may not be used with Bedlington Terriers. Use is discouraged in dogs that will be breed in the future due to the side effects. One of which is that the next estrus may occur between 7-200 days post discontinuation. It may not be used before the first estrus. Correct timing is difficult but timing determines effectiveness. Liver damage, increased risk of vaginal infections, incontinence, body odor, skin problems, vaginal distortion, increase in mounting behavior, personality change (increased aggression), vomiting and loss of appetite resulting in weight loss are reported.

Immunocontraceptive & Chemical contraceptives

These alternatives involve chemical injections or implants of antigens or chemicals to protect against pregnancy; thereby, avoiding incisions. The different forms of chemical sterilization effect the gender specific organs in different ways. According to the Alliance For Contraception in Cats & Dogs (ACC&D) think tank conference in 2009, tens of million of dollars are being poured into ongoing research and development around the world for this (and other) less invasive and effective means of birth control that leave the gonadal organs in tact. Some of the methods are highly effective in wild animal populations. An example is the single dose vaccine called SpayVac, which is used in herds of wild horses, elephants

and deer but which is less well researched in female canines. Because these technologies are so new there is little research available at this time to confirm their long term safety and efficacy in dogs, but they are a technologies worthy of keeping an eye on for future consideration.

Additional methods for sterilization being investigated include the use of ultra sound, microwave and radiation techniques. Like some of the immunocontraceptive technologies, they are not quite ready for use, but they are being researched and developed. So we sit, wait and continue to hope for non invasive, effective and safe sterilization and contraception technologies.

Conclusion

So we sit, wait and continue to hope for non-invasive, effective and safe sterilization and contraception technologies. In the meantime, it is HIGHLY advisable that one consult with a Board Certified Theriogenologist (reproduction specialist) and your vet for more in-depth information pertaining to sterilization and contraception methods and procedures. Consult with more than one vet if in doubt. Talk to department heads and researchers at veterinary colleges and universities. Conduct your own literature review. Don't forget that this series is intended only as a scant review of options to get you started, versus being a comprehensive study and in-depth description of all the alternatives. We take no sides on the issue.

Part III will focus on neutering options available for our 'little-big' guys and resources to serve your own inquiry. Meanwhile, go play with your TT.

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To Neuter, Or Not, And Our Lack of Omnipotence.
Part III

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Over the past few months we've explored the controversy and confusion surrounding neutering. We described some of the health risks associated with the practice and its traditional applications, which has fueled dog owners' feelings of confusion and helplessness. Part II summarized available neutering options for our girls.

The intent of this three-part series is not to stir controversy, but to inform. In part III we focus on neutering / sterilization options for our guys. Do remember we that this series should **not** be considered as a comprehensive holy grail for spaying / neutering, nor for advocating use of the alternative methods. Rather, consider the series as a primer or tool for use in the service of your own detective work and decision making, and as material you can use in discourse with veterinarians. If you are frustrated by the dearth of options for females, well there are fewer for males. However, hope for safe, effective, affordable, convenient and non-invasive techniques is married to the huge amount of money going into research and development, which enjoys world wide attention and support. The future looks bright.

Vasectomy
Similar to tubal ligation in females, vasectomy employs small incisions for the cutting and tying of the vasa deferentia. As such, it is considered to be less painful with a more rapid recovery time. Health benefits from hormonal production continues.

The downsides include finding a veterinarian who is trained in the procedure outside of Board Certified Surgeons. Behaviors like marking, roaming and mounting will most likely continue without training. Things get more complex in the cryptorchid male in whom one or more testicles have failed to descend into the scrotum. Chris Zink DVM, PhD, DACVP, DACVSMR recommends the combined use of vasectomy and the partial use of castration because out of every 1000 dogs, 12.7 will develop testicular cancer in the retained testicle if they live to 10 years of age. As such, she advocates for surgical removal of the retained testicle and a vasectomy on the remaining testicle, which would protect continued hormonal production and prevent the "likely genetic condition" from

being passed on to offspring.(1) Doing both procedures represents a cost increase but hormonal production is retained.

Immunocontraceptive and chemical technologies
This is the hot area of world wide research for several reasons. According to Dr. Margaret Slater, associate professor of epidemiology at Texas A&M University, "the number of new litters...in the United States vastly exceeds the delivery system for surgical sterilization."(2) Joyce Briggs, President of the Alliance for Contraception in Cats & Dogs, is searching for a drug, vaccine or implant that is safe, inexpensive and capable of rendering a cat or dog permanently sterile after a one-time procedure." The American Veterinary Medical Association (AVMA) encourages research into non surgical procedures. The Parsemus Foundation is funding and working "to improve the evidence so veterinarians and rescue groups can make a fully informed decision(s)" regarding use of the calcium chloride sterilant in their practice contexts.(2)

So how come we don't have them yet? Dr. Jochle posits that while there are many promising possibilities that exist, the pharmaceutical industry is reluctant to invest until a perfect product can be produced.(3) In an interview by Douglas Quenqua with Joe Tosini, founder and executive director of Ark Sciences, Tosini states that Zeuterin isn't a product, but "a procedure that has to be taught" to vets.(4) And almost everyone agrees that one method that might be great for one population may not be the best option for all.

So lets look at the most promising up-and-coming options for male sterilization. Zeuterin (ZN*)* is a zink gluconate injectable sterilant that was FDA approved in 2003 under the name Neurtersol. Neutersol was removed from the market because it had been sold to vets without teaching them how to safely do the delicate injections resulting in adverse events. Neurtersol got a bad reputation and the drug and manufacturer disappeared two years later. The patent was repurchased and renamed. ZN only came on the US market in February 2014.

Zeuterin (ZN) injections are given directly into the epithelium of testes where the cells that develop into sperm are destroyed; thereby, destroying sperm, and closing of the passages of normal travel. Current literature posits that it is 99.6 percent effective. Normal endocrine function is retained. Some studies report a reduction of testosterone by as much as 50 percent while other studies report no reduction of testosterone levels at all. ZN is metabolized within 48-72 hours and is irreversible. It may be given at three months of age. The manufacture does not sell ZN to veterinarians who have not been certified by Ark Science as to

having attended their five hour training course. Anesthesia is not required. Because the dog *appears* to be in tact, certificates of neutered status are provided.(4)

There are downsides, many of which involve possible unethical practices of owners, breeders, veterinarians, vet. technicians and shelters.(5) In an interview with Dr. Becker of Healthy Pets, Dr. Kutzler mentioned reports of injection site reactions that range from being minimal to a chronically draining tract; the latter of which would require removal of the scrotum, which ranges between 0.5 to 1.8 percent of the *total* injection site reactions. In a footnote to the interview, Becker states severe cases of negative reactions," "reactions required antimicrobial treatment, orchiectomy, and extensive surgical debridement and reconstruction, including scrotal ablation in *two* dogs". Both dogs made a full recovery."(6)

Calcium chloride is an injectable sterilant for males. It is now, and has been, diligently pursued by researches in India and Italy, both of which indicate that it is effective for sterilization by non invasive means. As of 2014, it is being used and researched in the USA. The downside is that hormones, like testosterone, are diminished. The Paremus Foundation is funding research into the use of injection site alternatives. Specifically, injection into the epididymus instead of injection into the testes; thereby, providing sterilization *without* hindering testosterone production while maintaining hormonal production and balance.(2)

As you will notice, the Zeuterin and Calcium Chloride technologies have just been approved (2014) for testing in the US. even though they have been tested across the globe prior to 2014. So it makes sense that we don't know all the downsides and benefits because empirical research takes years for completion, and then two to five more years for the publication in peer reviewed journals. The wait is still well worth the effort of following their progression.

Conclusion

In summary: The most important factors we consider when facing the complex question of whether to Spay or Neuter, include the age at time of neutering our canine kid, their health status, their size and breed, the risk factors and benefits of the different methods, and the training and skill level of the veterinarian. A review of the literature highlights how reduction in hormonal production and balance is believed to be one of the major causes of many of the most serious negative side effects associated with the traditional method of removed of all gonadal organs.

We're still not omnipotent. The issues generate heated debates and discourse and there are no right or wrong answers. Those who view the world in black and white terms have an easier life than those of us who view the world and it's issues as multiple shades of grey.

To supplement the references sited, you might find some of these sites helpful in your search for information. There are thousands. More leads are found from each site visited, like a snowball builds as it travels the ground. Happy snowman building, and be sure to include your flying fur ball in the process.

Possible helpful links.
www.avmajournals.avma.org (Journal of the American Veterinary Association)
www.nal.USDA.gov/awic/pubs/SpayNeuter 09/immunological.shtml
www.acc-d.org (Alliance for Contraception in Cats & Dogs.)
www.plosone.org
www.thedogpress.com
www.veterinarymedicine.dvm.com
www.onlinelibary.wiley.com
www.veterinarypracticenews.com
www.columbusdogconnection.com
www.wspa-international.org (World Society for the Protection Of Animals)
www.parsemusfoundation.org
www.journals.elsever.com/theriogenology/
www. journals.elsever.com/animal-reproduction-science/
www.vetsci.org

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(4) Douglas Quenqua interview with Joe Tosini.New Strides in Spaying and Neutering. New York Times 2013.
(5) Dannielle Romeo Newsdesk Editor. The Dog Press. 2014. http://www.thedogpress.com/Columns/Shemical-Neutering-Romeo
(6) Dr. Karen Becker (2013) Illegal in Scandanavia, Surgical Sterilization Is Still Routine in America. http://healthypets.mercla.com/sites/healthypets/archive/2013/09/2...