

Early Age Spay/Neuter; Pros, Cons and Protocols

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It is a shocking reality that we lose between 10-25% of our total dog and cat population each year due to “humane killing”, or euthanasia, in the animal control facilities of the United States (1). This is by far the number one cause of death ahead of infectious disease, cancer and trauma. While the veterinary profession proudly offers better and more technologically advanced medical care to the fortunate pets of our middle and upper income pet owners, we have little to offer the unowned or marginally cared for cats and dogs. As a profession and as a society, we have succeeded in significantly extending the average lifespan of dogs and cats with well-accepted preventative measures such as vaccination, parasite control, spaying and neutering and protective confinement. In fact, euthanasia numbers due to overpopulation alone have plummeted from the highs in the early 1970s to now, primarily due the acceptance of routine spaying and neutering. Still, a conservative estimate of *3 million* preventable deaths per year is terribly high. We can and should do better.

There are many reasons that dogs and cats end up homeless, abandoned, or neglected. Population and shelter medicine are growing specialties in the veterinary world, and public animal welfare policies are changing every year. Each community has slightly different problems. Some localities find that they must to kill young, healthy puppies and kittens due to high birth rates, while other localities euthanize primarily young adult dogs and cats who become homeless due to “behavioral issues”, or, more accurately, their owners’ unrealistic expectations. It is easy to point the finger at irresponsible pet owners, but it is not that simple. Communities must offer effective education in pet behavior and training as well as reconsider our methods used to lower the birth rates. Controlling and legislating irresponsible breeding must be done. This seminar focuses on examining new protocols for reducing the chance of unwanted litters.

Not Really New

Most veterinarians were taught in school that the proper age to spay or neuter a dog or cat is 6-8 months of age. However, this date appears to have been set arbitrarily. It is well established that spaying a female before first her first heat cycle greatly reduces the risk of mammary cancer in both dogs and cats. Unfortunately, we also know many cats that go into heat long before that 6 month birthday. There were no scientifically valid studies run to establish altering at 6 months and not sooner. In fact, farm animal veterinarians have accepted for years that it is acceptable and even preferable to castrate baby calves, lambs and piglets weeks from birth. Behavioral benefits are high and complications are low. It should not be surprising, then,

that we are realizing these same truths in regards to the timing of sterilization in dogs and cats. When this was first suggested to the veterinary community by Leo Leibermann, DVM, in 1985 (2), negative responses were fired off by practitioners who held misconceptions regarding the potential complications and long-term risks. Certainly, it remained to be examined which of these concerns were valid, but even now, 20 years and dozens of published studies later, there are still many who hold unsubstantiated and even incorrect beliefs. In one recent study, 84% of veterinarians listed at least one risk of spaying or neutering before 4 months of age that did not exist when done at an older age (3). Also, 29% believed that there were long term risks which increased later in life. As more information is gathered, we are learning that any procedure, whether it is surgery or vaccination, carries with it both risks and benefits.

Why Even Consider Spaying or Neutering before 6 Months of Age?

Certainly, we are more comfortable recommending procedures we are familiar with. Why even try to change what works just fine? Well, as previously mentioned, it is not really working just fine. One study of 1,272 households and 9,571 dogs and cats received by a local humane society revealed that 63% of dogs and 80% of *owned* cats were neutered (4). Note the definition of “owned” cats versus stray/feral cats which most estimate equal or exceed the former. Of the households which reported a litter in the past year, nearly all of the *cat litters were unplanned*, while *2/3 of the dog litters were planned*. One conclusion could be that cats must be spayed before sexual maturity (owners, if informed, would accept), while dog owners must be educated on the need to breed only carefully selected animals, as well as the health benefits of sterilization to their individual pet. Another study published by the MSPCA (Massachusetts Society for the Prevention of Cruelty to Animals) reported similar sterilization percentages, but, more importantly, noted that 20% of the animals had litters before they were neutered! (5). Finally, to highlight community and regional differences, a study of 43,831 dogs and cats in Texas revealed that only 29.4% of their population were sterilized! (6) Results varied widely from rural versus urban, dog versus cat and sheltered versus licensed populations.

Since animal welfare societies and municipal shelters shoulder the burden of unwanted cats and dogs, it is not surprising that they are eager for new solutions. For years they have witnessed the offspring of animals adopted from their facility being recycled into the community or dumped at the shelter, even though most states now require that animals acquired from humane or rescue groups be neutered. Generally, this was achieved via neutering contracts and monetary deposits, many of which were not enforced. Up to 40% of new adopters DO NOT comply with these contracts or comply only after the “accidental” litter is born. The benefits of “Neuter Before Adoption” (NBA) policies are obvious and most progressive shelters as well as at least one state now require it. Potential adopters certainly prefer a neutered pet over a unneutered (intact) one- one less item for the “to-do” list. In fact, many responsible breeders now practice it to ensure that “pet-quality” offspring are not bred. Unfortunately, in some areas it can be very hard to find veterinarians outside of shelters who will agree to perform these very simple procedures.

What is the Reason for Reluctance to Offer Early Age Spay/Neuter?

The previously used reasons of “newness” or fear of the unknown are quickly losing their validity as early age neutering has been widespread in the shelter community for over 30 years and reports following large numbers of animals have now been published several times over. It cannot be for lack of endorsements as the American Veterinary Medical Association (AVMA) voted in the summer of 1993 to endorse the procedure. All national humane organizations and even breed fancier associations such as the American Kennel Club (AKC) and Cat Fanciers Association (CFA) support it. Certainly some surgical and anesthetic techniques must be altered, but when accomplished, most veterinarians will never wish to return to the overweight, multi-estrus spay they struggled with in the past. We will address technique considerations and protocol adjustments in the next section. First, each of the common concerns about risks and benefits and several well-designed recent studies will be discussed.

Risks versus Benefits

The most frequently expressed concerns veterinarians had regarding the long-term safety of early age spay/neuter include increased risk of urinary tract obstruction in male cats, increased incidence of obesity, adverse effect on the developing immune system, urinary incontinence in the female dog, abnormal growth patterns (stunted, long bone fractures), and perivulvar dermatitis due to infantile vulvas. [summarized from reference (11)] “Early age” groups were compared to “traditional age” groups referring to the *timing* of spay/neuter surgery.

- Immune system: One early study suggested an increased risk of infectious disease (Parvo) in the early age group, however, later studies have not supported this (7). This short term risk must be managed, though, in any population of susceptible youngsters. It is certainly considered correct protocol in most well-run shelters to keep puppies, whether pre-or post surgery, in strict isolation from both adult dogs and other litters. In privately owned pets, the surgery can be scheduled after the puppy or kitten has had at least their first 2 vaccinations, although in shelters, the risk of delaying surgery still outweighs the risk of increased infectious disease. The largest study to date revealed a significantly lower long-term rate of gingivitis and asthma in cats neutered at an early age versus those neutered at the traditional age (8) and no long-term differences in dogs (9), an indirect reflection on immune function.
- Skeletal growth: The early concern about skeletal growth worried that early age group would be stunted in size. Rather, it turns out that growth *rates* were unaffected, although bone growth plate closure was delayed in some categories (10). Similar mixed results were found in cats. Therefore, bone length was actually slightly longer in the early age group overall and the neutered versus intact groups. Long-term studies with large sample size (>1660) showed no increase in bone fractures or arthritis in the early age group versus traditional age (9). There was a slight increase in dogs diagnosed with hip dysplasia in the early age group, including some that were diagnosed at a relatively young age. Strangely, but importantly, those diagnosed with hip dysplasia from the

traditional age group were 3x more likely to be euthanized due to the severity of the disease, leaving us to wonder how accurate the diagnoses were.

- Urinary tract health: Urethral diameters were measured in male cats from the early age group and compared to the traditional age group, revealing no differences. Also, in the Spain et al study (9) and others, no evidence of increased urethral obstruction or FLUTD was found in the early age group.

In female dogs, there were mild increases in urinary incontinence from the early age group versus the traditional age group. It has been well established that estrogen-responsive urinary incontinence (leaking small amounts of urine while relaxed or sleeping) is increased in *spayed* bitches overall (4% vs 0.3% for intact bitches). It now appears that this may increase 2-3% the earlier the spay is performed (10). While smaller studies did not find this result, the larger sample size may have revealed the relationship. This study did not find that adopters found this condition to be a reason for relinquishment, and further study is needed to determine its true significance. This single result has been used to recommend waiting until about 12 weeks of age to spay female puppies, if possible. In privately owned female dogs, this is a reasonable recommendation. However, in most shelters in southwestern Virginia, the pressure to adopt out puppies before exposing them to infectious disease and before kennel space runs out dictates that most are spayed at whatever age they are brought to the shelter. In a recent web-based shelter vet forum, the majority of shelter vets participating felt it was more important to stop the cycle of reproduction than to take the small risk of urinary incontinence later in life.

One additional finding (10) was that the early age spayed female puppies had a slightly higher rate of bladder infections than traditional age spayed dogs. However, the condition was easily treated and did not become chronic.
- Obesity: Since it has been shown that neutered dogs and cats, in general, have lower metabolic rates and tend to gain weight more than intact dogs and cats, it was anticipated that this would be even more pronounced in the early age neuter group. However, all the studies to date show no difference at all in the early age neuters versus the traditional age neuters in regards to body condition scoring.
- Anatomy of the penis, prepuce and vulva: Perivulvar dermatitis, while related to poor hygiene and obesity, was not related to early-age neutering. Although the size of the penis and prepuce are smaller in the early-age neutered dogs and cats, no clinical significance or medical condition has been associated with this difference.(9,10)
- Behavior: The few differences in behavior that has been considered statistically significant have generally been positive for the early- age group. This is a relatively important category as behavior problems considered serious by owners of adopted or purchased pets are one of the main reasons pets end up in the shelter. Neutered animals, in general, have been considered to be better pets and companions due to the lack of drive to wander, mate, fight and defend territory. Some of the differences found in

behavior may be related to the differences in adopting a baby from the shelter versus a young adult. Cats were less hyperactive and more shy to strangers who were neutered (and adopted) at the early age. Male cats were less aggressive toward veterinarians, fewer sexual behaviors, and less urine spraying if neutered (and adopted) at the early age. However, when asked to consider only the conditions the owners considered serious, there was no statistical difference. Dogs in the early age group had less separation anxiety, less urinating when frightened, and more noise phobia. Early age group also had more aggression toward family members, barking/growling at visitors and excessive barking. However, this result was strongly influenced by the fact that the shelter involved screened all young adult dogs and removed any from the adoption pool who had evidence or history of these behaviors. Therefore, puppies who were predisposed to these behaviors at a later age were inadvertently adopted out. A different study design is required to reveal true behavioral risks or benefits.

Surgical and Anesthetic Techniques to Consider

Although anesthetizing and operating on small kittens and puppies may seem daunting, the techniques have been well described (12-14). The best advice overall is to use familiar protocols and dose it down to the smallest patient (think tiny Chihuahua or Tea Cup Poodle). One comforting study was done with veterinary students performing the anesthesia and surgery in nearly 2000 animals (15). The learning conditions were harder on the young patients than in a standard hospital, but the results revealed a significantly lower incidence of complications in the youngest aged group (less than 12 weeks of age) than in the traditional aged group. Certainly if the inexperienced veterinary students could produce these results, an experienced surgeon can do the same.

The advantages of surgery on the early age patients include: [adapted from (16)]

- Smaller doses and volumes of anesthetic drugs used.
- Less bleeding.
- Elastic tissue for easy ligation.
- Smaller scale for closure and less time overall.
- Less body fat obstructing good visualization and less dissection.
- Faster recoveries and less patient discomfort.
- Very low complication rates (compared to traditional age)
- Faster healing.
- Happier babies than the sore young adults! (And happier moms and dads)

The chief concerns to pay greater attention to: (especially in the under 12 week group)

- Hypoglycemia:
Do not fast the younger patient (less than 12 weeks or smaller sized) more than 4 hours.

Feed a small meal as soon as they are on their feet (they will eat!).

Remember that their energy stores are smaller. You may rub Karo syrup on their gums as a preventative after surgery.

- Hypothermia:

Do not allow them to get too cold- avoid use of excess alcohol in prep stages (some use warmed, sterile saline to rinse after scrubbing with warmed chlorhexidine soap).

Put the babies on warm water blankets or gently heated surfaces. Use warm water bottles or gloves if needed.

Do not place directly on a cold floor or stainless steel.

- Blood loss:

Remember, relative blood volume is lower and their body less tolerant of loss.

Luckily, the vessels are tiny, easily visualized and fewer in number.

Anesthesia Considerations:

- Remember that higher heart rates (200+ beats per minute) and higher respiratory rates (15-35 per minute) are normal. You may have to re-set your pulse oximeter settings. After surgery, check temperature if they are not quick to recover as most are..
- Due to the difficulty in accurately dosing very small volumes, we usually “mask down” with isoflurane gas the smaller ones who weigh less than 3 pounds. They must get peri-operative pain control medication and we use butorphanol, buprenorphine and/or ketoprofen. Those larger than 3 pounds get our standard anesthetic protocols.
- Although most need very little pain control medication after the day of surgery, some females may be more tender than others and again we use oral butorphanol or liquid Metacam. Keep the baby girls separate from the baby boys who may get too rowdy too quickly.
- Theoretically, relatively lower doses of drugs are needed, although we do not find that to be notable.

Surgical Tips:

- ✓ Make the skin and linea incision a lot more caudal than usual for puppies- more like the cat incision.
- ✓ Do not be surprised to find copious straw- colored fluid free in the peritoneal cavity of female puppies and kittens. You have not punctured the bladder! (Bladder should be expressed as in any prep for surgery). Use sponges to soak it up if you need to see the uterus. Male puppies sometimes have this fluid squirt out from the tunica if you inadvertently open it during castration.
- ✓ If you have trouble finding the tiny uterus that some young, soon-to-large puppies have, simply reflect the bladder and it will be right there!

- ✓ Handle the ovarian pedicles gently as they may tear easier than you are used to. I rarely find the need to put 2 ligations as it seems to be more suture material than the pedicle itself!
- ✓ Suture material is personal, but 3-0 or 2-0 Monocryl works well for us. Very few suture reactions to this. Interrupted pattern on linea. Continuous pattern in the SQ and dermal. Finding the SQ or getting a hold of the dermal layer may be tricky until you get used to the thin nature of it. A small drop of glue is useful if the edges are slightly gaping.
- ✓ Male puppies are incised right over the scrotum as the skin has not yet developed any differently than the pre-scrotal skin. Be sure to palpate all males, puppies and kittens, to be sure you feel 2 testicles. I do not recommend searching if 2 are not felt- simply wait until he is a bit older! Be sure to prep the skin of the scrotum as you may not be used to doing this in older males!
- ✓ Male puppies may be castrated exactly as you do male cats and left open to heal- many shelter and spay/neuter veterinarians recommend this, although I still close with 1 or 2 stitches.

Summary

Many animal shelters and welfare societies have already adopted the procedure of early age spaying and neutering. They readily see the benefit for themselves and the entire community. Neutered puppies and kittens are preferred over those that are not. Some may make adjustments to adopt out 7-12 week old female puppies and have them return for surgery after they are 14 weeks in order to avoid the concern about increased incidence of urinary incontinence. Most will not have the resources to follow-up or worry about the puppies never being spayed and will simply perform the spay before adoption.

The procedure of early-age spay-neuter can easily fit into and benefit the average private veterinary practice by scheduling the surgery appointment at the same time as the final vaccine series. In this way, the veterinarian can be sure that the clients will comply with your recommendation to sterilize their new pet before estrus occurs or even that accidental, unwanted litter. After this visit, the client can walk out with a rabies certificate, a neuter certificate, and an application for a (now reduced cost) dog or cat license. Their baby will heal faster and smoother than the hyper, excitable “teenager” would. The community, the practice, the client and the young patient all benefit from following this standard practice!

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