

The Kindest Cut of All

Spaying and neutering young kittens and puppies

BY BRENDA GRIFFIN, D.V.M.



Veterinarians receive instruction on pediatric spay/neuter at a training lab. The National Spay/Neuter Training Center at the Humane Alliance in Asheville, N.C., offers year-round continuing education for veterinarians in pediatric spay/neuter.

Ask yourself: Which animals are most often adopted from your shelter? Then ask another question: Which animals are most likely to leave before they are spayed or neutered? For many shelters, unfortunately, the answer to both of these questions is the same: kittens and puppies.

According to a 2009 survey by PetSmart Charities, approximately one in three pet owners do not have their pets spayed or neutered

in a timely fashion following adoption. Of those surveyed, 13 percent of dog owners and 19 percent of cat owners had allowed their pet to have a litter—usually unintentionally. Furthermore, the survey revealed that substantial confusion exists among pet owners regarding the appropriate age for spay/neuter.

When animal adoption organizations require neutering but fail to perform the surgery prior to placement, they inevitably end

up adding to the number of litters born in their community. Even if a shelter has a 90 percent compliance rate for post-adoption spay/neuter, if one of their adopted dogs has a litter of 10 puppies, they're right back where they started.

For these reasons, shelters should always strive for neuter-before-adoption for all cats and dogs, including those often-overlooked kittens and puppies as young as 6 weeks of

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age. When shelters meet the goal of 100 percent neuter-before-adoption, they can take pride in knowing they are setting an example of responsible pet ownership and are ensuring that their agency's adopted pets will not reproduce!

What does "pediatric" spay/neuter mean?

"Pediatric," "early-age," or "prepubertal" sterilization refer to the neutering of patients between the ages of 6 and 16 weeks, a practice supported by the American Veterinary Medical Association, the Humane Society Veterinary Medical Association, and the Association of Shelter Veterinarians. Some humane organizations began sterilizing young kittens and puppies prior to adoption as far back as 35 years ago.

Given that cats may experience estrus (heat) and become pregnant as early as 4-5 months old, delaying the spaying of kittens commonly results in a significant number of litters. And although dogs are not typically as precocious as cats, they often attain

puberty at approximately 6 months of age. Performing spaying and neutering prior to puberty—as well as prior to adoption—is the only way to ensure that your adopted pets do not reproduce!

Why do many vets still recommend spay/neuter at 6 months or older?

Most owned pet cats and dogs are neutered in private veterinary practices in the United States between 6 and 9 months of age, which is commonly recommended as the appropriate timing for surgery. But this recommendation is not based on a scientifically defined appropriate age for these procedures. It was probably originally chosen because anesthetic and surgical techniques were less advanced at the time, and surgical success was more likely in a larger patient. Despite considerable advances in anesthetic and surgical techniques and published data that illustrate shorter surgical times and lower complications rates for younger patients, these practices remain common.



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Brenda Griffin checks out a pup prior to surgery. All patients should undergo a veterinary exam before they're sterilized.



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Four male littermates are anesthetized and prepared for surgery. The techniques for performing pediatric spay/neuter are similar to those used in traditional-age patients; special equipment is not required.

Is it really safe to perform surgery on the babies?

Many veterinarians have expressed concerns regarding both the short- and long-term effects of sterilizing pediatric patients. In response to these concerns, numerous controlled prospective studies as well as large retrospective studies have been performed to establish the safety of these procedures.

Data from these studies suggest that early-age sterilization is not associated with serious health problems and is surgically and medically sound. In fact, it offers many advantages, including safe anesthetic and surgical techniques, shorter surgical and recovery times, and avoidance of the stresses and costs associated with spaying an animal while she's in heat, pregnant, or with pyometra (infection of the uterus).

One of the greatest concerns expressed by veterinary practitioners regarding early-age neutering involves its influence on urinary tract development and health of male kittens. Despite a lack of evidence on this front, some veterinarians have surmised that neutering young kittens may result in decreased urethral size, increasing the risk of feline urinary tract disease and urethral obstruction.

But numerous studies have evaluated urethral size, function, and health in neutered tomcats compared to sexually intact tomcats. Based on contrast retrograde urethrograms and urethral pressure profiles, neither urethral diameters nor dynamic urethral function differ significantly between sexually intact tomcats and neutered cats,

Resources

For other useful studies that may help you broach the issue of pediatric spay/neuter with vets in your community, check out the following references in the *Journal of the American Veterinary Medical Association*:

- "The Association of Shelter Veterinarians veterinary medical care guidelines for spay-neuter programs," Vol. 233, No. 1, 2008; avmajournals.avma.org/doi/pdf/10.2460/javma.233.1.74
- "Determining the optimal age for gonadectomy of dogs and cats," Vol. 231, No. 11, 2007; avmajournals.avma.org/doi/pdf/10.2460/javma.231.11.1665

regardless of whether cats are neutered at 7 weeks versus 7 months of age or not at all. In addition, the incidence of urethral obstruction and lower urinary tract disease has not been shown to differ in regard to age of neuter.

Not just for litter prevention

Numerous health benefits are associated with spay/neuter, and its value as a preventive health care measure deserves emphasis.

When cats and dogs are spayed or neutered, diseases of the uterus, ovaries, and testes are eliminated, including cystic endometrial hyperplasia, pyometra, prostatitis, and various cancers of the gonads. Additionally, there is a significant reduction in the risk of mammary cancer in spayed versus sexually intact female cats and dogs—greater than 90 percent in those spayed before 6 months of age. Given that mammary tumors are among the most common types of tumors and are often highly malignant, this is a significant health benefit. In addition to the physical benefits, neutering also commonly results in the elimination of highly objectionable behavior, including scent marking, spraying, fighting and roaming. Remember: Timing of spay/neuter is key. It must occur before adoption and before puberty. This will ensure that cats and dogs do not reproduce, and will afford the individual animals with many health benefits.

Patient selection for pediatric spay/neuter

Shelter staff should select pediatric patients who appear in good health and body condition. Whenever possible, they should be vaccinated and dewormed prior to surgery. Routine infectious disease control protocols, including careful cleaning and disinfection, should be in place to minimize the risk of disease transmission.

As always, a veterinarian should examine each patient before surgery in order to make a final determination as to the patient's suitability as a surgical candidate on the given day. Many veterinarians prefer that their surgical patients weigh at least 2 pounds; however, some have great success with even smaller patients, so this parameter is at the veterinarian's discretion.

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Special considerations for pediatric spay/neuter patients

While the safety of administering anesthesia and performing surgery on young kittens and puppies has been well-established, surgical staff should be aware of the unique physiology and anesthetic requirements of the pediatric patient. Major concerns around the time of the surgery include hypoglycemia (low blood sugar) and hypothermia (low body temperature). These are easily avoided with some simple precautions.

Young animals possess minimal stores of hepatic glycogen, increasing their risk for hypoglycemia. To prevent hypoglycemia:

- Do not fast patients for more than two to four hours pre-operatively. The stomachs of pediatric patients empty rapidly, and a small meal a couple of hours before surgery is recommended and will not increase the risk of aspiration.
- Administer 50 percent dextrose or Karo syrup orally post-operatively if the patient is slow to recover (1 ml per kg of body weight).
- Feed a small meal once patients are standing or within 30 minutes to one hour after the operation.

Kittens and puppies have a large surface-area-to-volume ratio, and possess immature thermoregulatory systems and lesser fat stores than older patients, predisposing them to hypothermia. To prevent hypothermia:

- Provide bedding and sources of conductive heat and/or convective air warming.
- Use warm prep solutions and avoid the use of isopropyl alcohol in surgical preparation, since it has a cooling effect upon evaporation.
- Avoid excessive wetting and clipping of the hair coat and large surgical incisions.
- Minimize surgical and anesthetic time.
- If fluids are administered, be sure to warm them prior to use. If subcutaneous fluids are given, they should be administered in recovery.
- Monitor body temperature as needed.
- Once mobile, allow litters to recover together.

Be sure to love on the babies

Pay careful attention to minimizing stress in pediatric patients. Baby animals experience sensitive periods in their development, and fear imprinting can occur when events be-



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FLICKR CREATIVE COMMONS

Kittens and puppies are often a shelter's "Mostly Likely to Succeed" on the adoption front, but they are also often the animals most likely to go home without first being spayed or neutered.

come severely stressful. The good news is that most kittens and puppies respond very positively to human comfort and bounce back quickly when handled gently and soothingly. In order to prevent undue fear and anxiety:

- House littermates together before surgery and as soon as they are able to stand in recovery to prevent separation stress.
- Handle all patients gently and lovingly, and soothe them if they become frightened.
- Consider use of premedications, especially for patients who are very nervous or uncomfortable.

Anesthesia and monitoring

Given that metabolic development is largely complete by 6 weeks of age, the same anesthetic protocols used in adults can be safely administered to pediatric patients. Special equipment is not required—however, non-rebreathing systems should be used for gas anesthesia. Balanced anesthetic protocols are essential and must include adequate analgesia (pain relief) for all patients.

Historically, anticholinergic (heart rate-increasing) drugs such as atropine or glycopyrrolate have been recommended for routine use in pediatric patients, since heart rate was previously believed to be directly related to cardiac output in these patients. However, clinical studies and experience have not supported this recommendation. In addition, an improved understanding of the potential adverse effects of these drugs makes their routine use undesirable and no longer recommended.

Because of their low body weight, pediatric patients are particularly susceptible to overdos-

ing of anesthetic agents. This can be effectively prevented by obtaining accurate body weight for calculation of drug dosages and diluting stock concentrations of drugs as necessary to improve accuracy of dosing. Predetermined volume-by-weight charts can be used to simplify preparation of appropriate dosages. For

specific information on anesthetic protocols, see the online resources of the Veterinary Task Force to Advance Spay Neuter hosted by the Association of Shelter Veterinarians at shelter-vet.org/members/vtfn/.

Regardless of the anesthetic used, patients should be continuously monitored by trained,

hands-on observers, and standard emergency readiness protocols should always be in place. As a rule of thumb, pediatric patients should maintain a heart rate of approximately 90 beats per minute and a respiratory rate of nine breaths per minute. These numbers are not absolute, and the patient should be monitored

Convincing Vets to Support Pediatric Spay/Neuter

People often tell me, “My organization wants to spay and neuter puppies and kittens before adoption, but we cannot find a vet who will do it.” Indeed, many veterinarians are reluctant to spay and neuter young kittens and puppies. In fact, it is quite common for these procedures not to even be taught in veterinary school. And, in some cases, veterinarians may have learned that surgical and anesthetic risks are greater in these immature patients compared to older ones. To the contrary: We now know that hundreds of thousands of young puppies and kittens have safely undergone these procedures. And, in comparison to older animals, both surgical and recovery times are much more rapid for pediatric patients!

But how do you convince reluctant veterinarians to perform these procedures? How can you walk the line of respecting their knowledge and experience, while meeting your goals of ensuring neuter before adoption for the animals in your care?

The good news is that to a large degree, the puppies and kittens will do it for you! All you have to do is convince one vet to perform spay/neuter on just a few of these young patients, and your doctor will quickly discover how easy and rewarding it is!

Here are some tips for approaching your veterinarian about pediatric spay/neuter:

- Be respectful of their time and their opinion: Contact each veterinarian individually. Make an appointment to see them; do not drop by.

- Explain the situation: You adopt many kittens and puppies, and ensuring they are spayed and neutered in a timely fashion is a high priority. Despite the best intentions of many adopters, life gets in the way, and they end up with a litter. Remove sentiment and stick to the facts. Tell them about your intake, adoption, and euthanasia rates. Be sure to tell them how many kittens and puppies leave the shelter without being spayed and neutered, and the difficulties of follow-up and ensuring compliance once they have gone home with adopters.

- Before your scheduled meeting, plan exactly what you will ask of them. Convince them to perform surgery on one litter. If they are not comfortable with surgery on 8-week-old puppies, start with puppies who are a bit older. When they have confidence doing 16-week-old puppies, bring them 12-week-old puppies. When they have no problem with 12-week-old kittens, bring them kittens who are 9 weeks old. Most veterinarians are already used to working on patients of all different sizes, and they will very quickly realize how well their patients do with these procedures at a very young age!

- Leave them some information—studies supporting pediatric spay/neuter, information about your organization’s intake and euthanasia rates. If possible, leave a copy of *Veterinary Seminars in Spay-Neuter Surgery: Pediatrics and/*

or other studies on the issue (See resource box, p. 49.)

- Consider funding a trip for them to the Humane Alliance training center! In my experience, most veterinarians who are not willing to perform pediatric spay/neuter have simply never done it before. Once they learn the procedures, they embrace them and are willing to do them on an ongoing basis.
- Offer incentives for veterinarians to participate. For example, when the pet is adopted, tell the new owner who spayed their new dog. Put a plaque in the veterinarian’s waiting room—their clients will be pleased to know their veterinarian is helping out. Never forget to thank them for their time and expertise! Sometimes if you can convince just one veterinarian in your community to assist with pediatric spay/neuter, that veterinarian may help to convince others; the argument will be better-received from a colleague. Perhaps that veterinarian could approach the president of the local veterinary association about arranging a continuing education session on pediatric spay/neuter. Most associations have such meetings several times each year, and this would be a great topic—a way to open some doors. Accept that you will probably never convince 100 percent of the veterinarians in any community to perform pediatric spay/neuter. That’s OK. Stay positive and remember: The key to success is honest and sincere communication.

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for trends in vital parameters. If bradycardia (low heart rate) occurs, gas anesthesia should be turned down, and body temperature should be measured to assess the patient for hypothermia. If necessary, appropriate reversal agents, anticholinergic drugs, or warm IV fluids may be administered. When the recommended protocols are followed and surgical times are kept short, bradycardia is rare.

Surgical techniques


Many of the surgical techniques used to sterilize adult cats and dogs can also be used for pediatric patients. As their tissue is elastic and devoid of excessive fat, the procedures are often easier and require less time to complete. The surgeon should be cautious to make the incision of a length appropriate for the size of the patient so as to reduce the risk of hypothermia. In pediatric patients, most surgeons prefer to center the abdominal incision midway between the umbilicus and pubis, as this affords the best exposure of the ovaries and uterine body. Upon entering the abdominal cavity, a moderate amount of clear peritoneal fluid is often encountered; this is normal. Tissues

are fragile and should be handled gently to minimize trauma and reduce hemorrhaging. Pediatric patients have poor ability to compensate for blood loss, predisposing them to anemia; however, achieving hemostasis (stopping hemorrhage) is simplified due to the lack of fat and ease of visibility of the pediatric tissues.

In conclusion, the American Veterinary Medical Association and the Humane Society Veterinary Medical Association encourage early-age sterilization and neuter before adoption. The Association of Shelter Veterinarians' Veterinary Task Force to Advance Spay-Neuter recommends that all cats and dogs be neutered prior to adoption, including those as young as 6 weeks old. The task force recommends that privately owned pets be neutered following completion of their kitten and puppy vaccines at 4-5 months of age. By performing timely spay/neuter procedures, animal shelters and veterinarians can enhance the welfare of their patients and reduce the number of litters born in their communities. Although it may seem intimidating at first to operate on a pediatric patient, it truly is much easier to operate on a 2-pound kitten or puppy than it is on a mature animal!

Training resources for pediatric spay/neuter

A new instructional video, *Veterinary Seminars in Spay-Neuter Surgery: Pediatrics*, is now available for veterinarians. This video is a high-quality veterinary education tool developed in collaboration with board-certified veterinary surgeons. It details the procedures for spaying and neutering pediatric patients. The video can be downloaded at no charge from Humane Alliance at humanealliance.org/index.php/vetextern-training/instructional-video-series. The DVD may also be purchased online.

In addition to the video, Humane Alliance also offers hands-on training opportunities for veterinarians at their state-of-the-art training center in Asheville, N.C. The North Carolina State Board of Veterinary Medicine grants continuing education credits to veterinarians for time spent at the center. The Veterinary Task Force to Advance Spay Neuter is also increasingly offering hands-on training in pediatric spay/neuter at major veterinary conferences. 



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