



#### TIMING IS EVERYTHING

Several studies illustrate the benefits of spaying/neutering a cat before it reaches 5 months of age, the approximate time it reaches sexual maturity.

## MANAGEMENT STRATEGIES

# Is There an Optimal Age for Cat Spay or Neuter?

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Over the past several decades, the recommended age for spay (ovariohysterectomy) or neuter (castration) of cats has changed. At one time, the recommended age for spay was after the female cat had a litter, then it changed to after the first heat cycle, and eventually the veterinary profession settled on 6 months of age or older. Given that cats reach sexual maturity at about 5 months of age, more and more people are advocating lowering the spay/neuter age to 4 to 5 months (early spay/neuter) and support early spay/neuter in animal shelters. All of these varied recommendations lead one to question: is there an optimal age at which cats should be spayed/neutered?

A study by IPSOS Marketing for PetSmart Charities in 2009 and repeated in 2011 found that the answer to the question is not well known among the general public.<sup>1</sup> The study highlighted a lack of understanding of the importance of spaying/neutering and confusion as to the appropriate age at which the surgery should be performed. Survey responses indicated that 3 out of 4 people surveyed either did not know when to “fix” their pets or thought that the best age was 6 to 9 months or older. Among those who had not had their pet spayed/neutered, 34% said that the pet was too young and 31% said that the surgery was too expensive.

To help minimize confusion and provide evidence-based guidelines, in January 2016, the Veterinary Task

Force on Feline Sterilization met to review the literature. They found no evidence of increased risk for complications or long-term adverse health effects after sterilization of pediatric and juvenile cats. The resultant Consensus Statement describes the benefits of spaying/neutering cats younger than 5 months of age (**BOX 1**).<sup>2</sup>

Evolving from the task force report was the Feline Fix by Five Months campaign, a national campaign to educate veterinarians and the public on the importance of spaying/neutering cats before they reach 5 months of age ([felinefixbyfive.org](http://felinefixbyfive.org)). Subsequently, the Task Force Consensus Statement was endorsed by other organizations, including the American Veterinary Medical Association, the American Animal Hospital Association, the American Association of Feline Practitioners, the Association of Shelter Veterinarians, the WINN Feline Foundation, the Catalyst Council, The International Cat Association, The Cat Fanciers Association, and several state veterinary associations.<sup>3</sup>

## REASONS TO PERFORM EARLY SPAY/NEUTER

### Decrease Overpopulation

Approximately two-thirds of IPSOS study respondents were unaware that pet overpopulation was a problem.<sup>1</sup>

**BOX 1 Benefits of Spaying/Neutering Cats Younger than 5 Months of Age<sup>2</sup>**

- Decreases the risk for mammary carcinoma
- Eliminates reproductive emergencies such as pyometra and dystocia
- Prevents unintended pregnancies (which may occur as early as 4 months of age)
- Potentially decreases behavioral problems linked with cat relinquishment

Current estimates are that 3 to 5 million dogs and cats enter U.S. shelters every year and that 1.5 to 2 million are euthanized. In most shelters, the euthanasia rate is higher for cats than dogs.

**Minimize Health Risks**

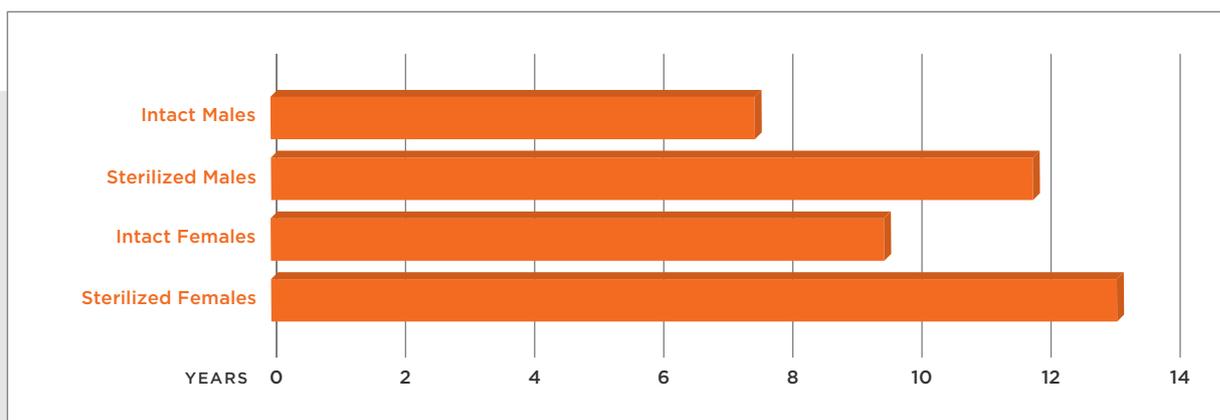
Decisions to perform any medical or surgical procedure on any patient depends on results of a risk-benefit analysis. Are there medical benefits for spaying cats before they reach 5 months of age? Epidemiologic studies conducted in 1981 and 2005 document a significantly lower incidence of mammary neoplasia among cats spayed before their first heat cycle.<sup>4,5</sup> This finding is significant given that mammary neoplasia is the third most common cancer in cats, that up to 96% of mammary tumors in cats are malignant, and that median survival time of cats with mammary neoplasia is generally less than 1 year.<sup>5,6</sup> Obviously, spaying or neutering eliminates diseases of the uterus, ovaries, and testes. Although spaying of cats that are older than 1

year has not been shown to reduce incidence of mammary neoplasia, removal of the ovaries and uterus would prevent pyometra and ovarian neoplasia.

Several research findings support sterilization of cats by 5 months of age. One of the earliest studies was conducted in 2000.<sup>7</sup> Howe et al. followed 263 cats adopted from animal shelters over 3 years. Sterilization was performed for 188 cats younger than 6 months of age and 75 cats 6 months of age or older. They found no increased incidence of infectious disease, behavioral problems, or problems with any body system in the cats sterilized before 6 months of age compared with those sterilized at 6 months or older.<sup>7</sup> In 2004, Spain et al. retrospectively followed 1660 dogs for up to 11 years after surgery.<sup>8</sup> They discovered that spay/neuter before 5.5 months of age was not associated with increased rates of death or relinquishment or occurrence of any serious medical or behavioral conditions.

**Increase Longevity**

The 2013 Banfield State of Pet Health Report covered longevity, based on data from 460 000 cats.<sup>9</sup> Among male and female cats, life expectancy was longer for sterilized than intact cats. Life expectancy for spayed females was 13.1 years and for intact females, 9.5 years. Life expectancy for neutered males was 11.8 years and for intact males, 7.5 years. The life expectancy of spayed cats was 39% greater than that of intact female cats, and life expectancy of neutered cats was 62% greater than that of intact male cats (**FIGURE 1**). The reasons for these differences were not determined and may include variations in onset of terminal illnesses, environmental factors (e.g., housed indoors versus



**FIGURE 1.** Feline life expectancy, according to reproductive status.<sup>9</sup>

outdoors), and incidence of fighting or accidents (e.g., hit by automobile).

## Decrease Shelter Populations

A survey of pet owners in Massachusetts found that female cats and dogs that had been spayed after having at least 1 litter accounted for 87% of all litters born.<sup>10</sup> The researchers found that local reproductive rates were not driven by dogs and cats that remained intact their entire lives; instead, they found the reverse. Cats and dogs that remained intact accounted for less than 15% of all litters born. If the Massachusetts results are consistent across the country and if everyone who planned to spay or neuter their cats did so before the cat was 5 months of age, 87% of kitten births would be prevented, the intake of litters of kittens into animal shelters would be significantly reduced, and “kitten season” in animal shelters might simply disappear.

Patronek et al. found that nearly one-third of cat relinquishments to shelters resulted from sexual behaviors of the intact cat.<sup>11</sup> For females, spaying before the cat reaches 5 months of age would eliminate the behaviors displayed when in heat as well as unwanted pregnancies. For male cats, neutering before 5 months of age would substantially reduce or eliminate male territorial marking, fighting, and roaming.

## CONCERNS ABOUT EARLY SPAY/NEUTER

Despite the above findings, some still question the advisability of reducing the age at which cats should be spayed/neutered, expressing concerns about surgical or anesthetic complications, potential urinary obstruction in male cats, orthopedic issues, and potential behavioral problems.

## Is Early Spay/Neuter Associated With More Surgical or Anesthetic Complications?

In 2000, Land reported on a survey of 85 veterinarians who had collectively performed approximately 200 000 early spays/neuters (dogs and cats).<sup>12</sup> The veterinarians unanimously stated that early spays/neuters were safer, faster, and easier than the same surgeries in dogs and cats 6 months of age or older.

In a prospective study of dogs and cats, Howe compared short-term complication rates among 3 groups of

None of the short-term or long-term studies have shown increased incidence of urinary obstruction among neutered male cats.

animals: sterilized at younger than 12 weeks, at 12 to 23 weeks, and at 24 weeks or older.<sup>13</sup> Researchers measured complications during anesthesia, surgery, and the immediate postoperative period (up to 7 days) and classified complications as being major (requiring treatment or resulting in increased morbidity or mortality) or minor (requiring no treatment). For incidence of major complications, they found no differences among the 3 groups. However, for incidence of minor complications, they found a significant difference; rates were highest among animals in the oldest group and lowest among those in the youngest group.<sup>13</sup>

Anesthetic drugs and protocols today are safe and effective for pediatric and juvenile patients. In 2002, Root Kustritz reported that the anesthetic drugs and anesthetic protocols in use at the time were perfectly safe for use in kittens as young as 6 to 14 weeks of age.<sup>14</sup> Concerns about small body size, hypothermia, and hypoglycemia are valid and require that the veterinary staff pay attention to maintaining body temperature and minimizing the length of time that food is withheld before surgery. Risk for hypothermia can be minimized by limiting the amount of hair clipped; using warm scrub solutions without alcohol; and using warming devices such as water-circulating heating pads, forced warm air flow, or active polymer warming blankets. Risk for hypoglycemia can be minimized by not withholding food for more than 2 hours before surgery.

## Does Early Neutering Increase the Potential for Urinary Tract Obstruction?

The most frequent argument in support of delaying male cat neutering is that performing this procedure before the cat is sexually mature predisposes the cat to urethral obstructions. The myth that neutering a cat before it reaches sexual maturity results in a smaller

penis and predisposes the cat to urinary tract obstruction has been proven to be false. In a 1996 study, Root et al. demonstrated no difference in urethral diameter between cats neutered at 7 weeks, neutered at 7 months, or left intact.<sup>15</sup> None of the short-term or long-term studies have shown increased incidence of urinary obstruction among neutered male cats.

### Is Early Spay/Neuter Associated With Orthopedic Problems?

Three fairly recent articles discuss orthopedic concerns associated with early neutering of large breed dogs. These articles have led to confusion about the appropriateness of and age at which spay/neuter surgery should be performed.<sup>16-18</sup> These articles were published in open access journals and have generated questions from veterinarians and the general public. With regard to these articles, 2 key points should be considered. First, the articles focus on large breed dogs, and their findings should not be extrapolated to cats. Second, no similar studies have found a relationship between spay/neuter and orthopedic conditions in cats.

### Does Early Spay/Neuter Lead to Undesirable Behavior?

A prospective 2014 study evaluated postsurgical behavioral issues in cats.<sup>19</sup> Porters et al. randomly divided 800 cats into 2 groups: sterilized at 8 to 12 weeks or at 6 to 9 months of age. Researchers tracked undesirable behaviors from immediately after adoption up to 24 months after adoption and found no evidence

that age at the time of sterilization had an effect on the number of or occurrence of undesirable behaviors.

### EARLY SPAY/NEUTER IN PRIVATE PRACTICE

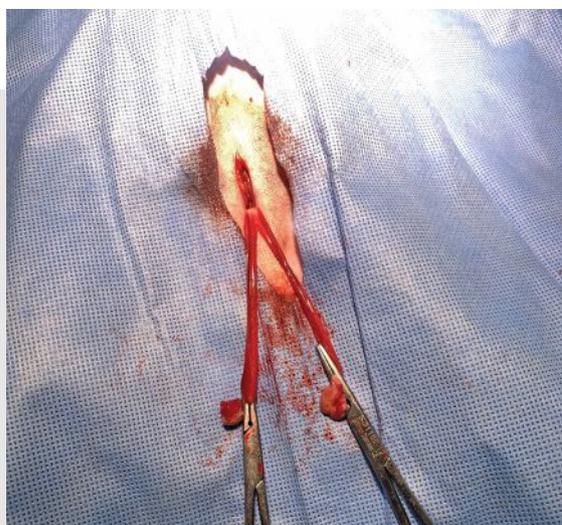
Most practices have defined kitten wellness protocols and schedule appointments for vaccinations and parasite control for kittens from about 6 weeks to 4 months of age. Early spay/neuter involves simply adding one more appointment 2 to 3 weeks after the last vaccination. In that manner, cats are fully immunized before being admitted to the hospital for surgery and sterilized before becoming sexually active.

### EARLY SPAY/NEUTER IN ANIMAL SHELTERS

Ensuring that all cats are spayed or neutered before adoption eliminates the risk of adopted animals producing more kittens. Many shelters will not spay/neuter kittens that weigh less than 2 pounds or are younger than 8 weeks; other shelters, however, will do so provided that the kittens are healthy, active, and in good body condition (**FIGURE 2**).

### CONCLUSIONS

The optimal age to spay/neuter a cat is before it reaches 5 months of age. For owned cats, the optimal age would be 4 to 5 months; for cats in shelters, the optimal age could be as early as 8 weeks. Current scientific evidence shows no medical or behavioral reasons to delay spaying/neutering of cats past 5 months of age, and there are population and health benefits to spaying/neutering cats before they reach 5 months. Sterilization surgeries are easier, faster, and safer when performed on cats younger than 5 months, and implementation of this practice is simple. **TVP**



**FIGURE 2.** Pediatric patient undergoing spay.

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