



# Timing of neutering

Traditionally both male and female cats have been neutered at six months old. For social, health and population control reasons, there is a strong case for neutering earlier. People working with feral cats may already be neutering at a much earlier age – often around eight weeks old, but basically when they can catch the kittens as they are unlikely to get a second chance. This is often referred to as 'early neutering' and is touched upon in this paper. However the main thrust of this statement is aimed at owned and rescue kittens which are going to make pet cats rather than survive in the wild. For this The Cat Group is arguing a case for 'earlier' neutering at around four months rather than the traditional six months.

## The issues

### Female cats

- ❖ It is important to neuter before the first season for population control. Timing of the first season depends on breed, time of year born and individual development. The first season usually occurs around six months but can be earlier. Queens can have up to three litters in a year.
- ❖ Control of nuisance. Female cats will call regularly (about every two weeks from January through until the autumn) if they do not get pregnant. Having entire female cats in an area will attract entire males with the attendant problems of spraying, fighting and caterwauling.
- ❖ Welfare issues. Unwanted kittens may not be cared for and are likely to suffer from various infectious diseases such as cat 'flu.
- ❖ Health issues. Female cats which are not neutered are more likely to suffer from pyometra (infection of the womb) later in life. Queens with infectious diseases may pass these on to their kittens. Pregnancy and birth are also not without risk.
- ❖ Wildlife issues. Cats with kittens will hunt more effectively and if they are not being fed will need to catch more wildlife to feed their kittens.

### Male cats

- ❖ Control of nuisance. Unneutered male cats are likely to stray over a large area, will mark their territory with a very pungent spray and are much more likely to fight - with attendant noise nuisance.
- ❖ Health issues. Fighting males are much more likely to spread diseases such as FIV and FeLV to other cats. They are also likely to suffer from fight injuries such as abscesses. Because they wander over a large area they are also at greater risk of suffering road traffic accidents.
- ❖ Pet issues. Unneutered male cats will wander from home and may not return. They may also spray inside the home and may be aggressive to their owners.

Therefore it is desirable to neuter kittens early enough to ensure that the above problems are prevented.

## What are the concerns about neutering earlier and what has been found out?

See reference list for details of scientific papers on the points below:

### ◆ Risks of anaesthetising younger kittens?

Potential anaesthetic problems such as hypothermia and hypoglycaemia are now recognised, and methods have been developed to overcome these. Surgical and anaesthetic techniques have also improved (see [www.thecatgroup.org.uk](http://www.thecatgroup.org.uk)).

### ◆ Implications for the cat's behaviour?

Results of research into behavioural development show no problems.

### ◆ Problems with growth and development?

Studies into growth and development show no problems in neutering before puberty (and as early as seven weeks).

### ◆ Problems of blockage - possible decreased urethral diameter in neutered animals?

Urethral diameter worries unfounded - studies show similar diameter to post-puberty neutering.

### ◆ Concerns regarding 'stress' in cats

homed/vaccinated/neutered within a short period of time.

No scientific data is available, but there is general agreement among veterinary surgeons that procedures should be separated if possible to minimise potential problems (such as reduced immunity or increased adverse reactions) caused by stress.

## Answering these concerns

There is no evidence to show that neutering earlier than six months (and as early as seven weeks) has negative developmental or behavioural consequences. The perceived increased risks of surgery/anaesthesia are now considerably reduced by published information on improved techniques and agents. (see Anaesthesia for neutering kittens on the website).

## When should a kitten be neutered?

This question has different answers depending on the origin of the kitten and the prospects of ensuring that it is neutered. In principle -

- ◆ Neuter as early as practical and before cat is sexually mature
  - (i) For owned kittens - book in to neuter soon after vaccinations complete (see below)
  - (ii) In the rescue situation, neuter when at the facility or as (i) for rehomed kittens
  - (iii) For feral kittens going back to site - neuter when trapped
  - (iv) For feral kittens young enough to go to homes, treat as rescue kittens (ii)

◆ Allow enough time between neutering, vaccination and homing to minimise 'stress'.

◆ Best to vaccinate before neutering as there is some risk of infection when at the veterinary surgery being neutered.

The Cat Group, launched in 2000, is a collection of professional organisations dedicated to feline welfare through the development and promotion of policies and recommendations on the care and keeping of all cats.

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### Vaccination issues:

Kittens usually have a vaccination course comprising two injections. The first can take place at eight to nine weeks old with a second following at 12 to 13 weeks (depending on the manufacturer's recommendations). Vaccines are available against FeLV, cat flu (feline herpesvirus and feline calicivirus), feline infectious enteritis, *Bordetella bronchiseptica* and chlamydia. There are a variety of combinations of these vaccines available.

### Suggested timing of neutering for

#### Pedigree kitten bought from a breeder

Rarely homed before 14 weeks old, already fully vaccinated (Governing Council of the Cat Fancy recommendation). Breeders usually insist new owners agree to neuter unless they have an agreement that cat can be used for breeding. Allow two to three weeks to settle into new home before neutering, giving a neutering age of around four months.

Some breeders are now neutering their kittens before they are rehomed.

#### Moggie from a home bred/accidental litter

Kittens usually 'free to a good home' at six to seven weeks onwards. Neutering is not usually discussed. Usually left to new owner to take responsibility for neutering. Book in for neutering two to three weeks after vaccinations complete. Therefore neutering at about four months old.

#### Kitten from a rescue organisation

Kittens available for modest fee from about eight to nine weeks. Advice usually given by rescue organisation and new owners often followed up with phone calls re neutering. Some organisations provide vouchers to encourage neutering and run neutering publicity campaigns. Practice varies between organisations. Rescue organisations have these options:

- ◆ Neuter before homing at 10 to 12 weeks. First vaccination is usually given with the owner left to complete the course. Where kittens are neutered on site in the veterinary facility at a shelter, the risk of infection is reduced compared to taking it to an outside source.
- ◆ Home kittens at eight to 10 weeks with owner signing undertaking to have neutering carried out. First vaccination should be given before homing with the owner undertaking to complete the course.

#### Feral kittens

If caught before seven to eight weeks old, can be treated as rescue kittens (above). If they are to be put back into a feral colony as part of a trap/neuter/release programme then neutering can be carried out as early as seven to eight weeks if necessary, as once released it is very difficult to catch them again. Neutered cats should be ear-tipped for future identification. It is recommended that kittens are given a first vaccination dose before release.

### Chemical neutering?

At present the only form of permanent neutering available is by surgical means. There is much interest in chemical neutering but at present this is not a viable permanent solution.

### Use of progestagens

It is possible to use progestagens for long-term semi-permanent postponement of oestrus. However, most veterinary surgeons would consider that the best course of action for cats not intended for breeding is neutering.

### Determining whether a female cat has been neutered

It can be very difficult to decide whether a female cat has been neutered. Rescue organisations are often faced with the decision as to whether to operate on a cat to clarify whether it has been neutered previously and ensure that it cannot reproduce.

There are a number of ways to determine whether or not a female cat has been neutered. The hair over the location(s) where the surgery is performed can be clipped to potentially reveal a scar. The cat can be observed over a period of time to see if she shows the behaviour of a sexually intact female. If these obvious approaches are unsuccessful or if, as is often the case in a rescue facility, time is an issue, the next step is to surgically explore the abdomen to see if the reproductive organs are present. If they are, the cat can be neutered at that time. Surgery is the most common approach to determining the reproductive status of a cat with an unknown history.

Recently, there has been much interest in using a blood test to detect whether or not a female cat is spayed because this would obviate the need for costly, invasive and potentially unnecessary surgery. To date, at least four hormonal assays have been described; unfortunately they all have major drawbacks that have discouraged widespread use. Some require that the cat is showing oestrus behaviour before it can be tested and so only help to confirm an already strong suspicion; some are not yet readily available. As well, the tests can be quite expensive, and in most cases their accuracy in cats has not yet been well studied.

### Summary of diagnostic blood tests for assessing reproductive status in female cats

The simplest test is to measure oestradiol levels in the blood. Oestradiol is produced at widely varying levels by developing ovarian follicles, with the highest levels occurring when the follicles are mature, ie, when the queen is showing oestrus behaviour. Therefore, this method may require multiple samples and/or a GnRH test (see below) to stimulate any ovarian tissue to produce oestradiol which can then be measured. Overall, oestradiol testing alone is not very useful for determining whether a cat is intact or spayed.

The **hCG Stimulation Test**, measures progesterone levels seven days after injection of hCG (Chorulon®, Intervet). The hCG induces ovulation which in turn leads to increased progesterone levels. Since the injection must be given one to three days after the onset of oestrous behaviour, this test (like simple oestradiol measurement) is not very useful for determining whether a cat is intact or spayed, although it is potentially useful for detecting the presence of ovarian remnants. (Chorulon is not licensed for use in cats)

The **GnRH Stimulation Test**, measures oestradiol three hours after injection of Receptal® (Intervet), a synthetic GnRH. GnRH stimulates production of FSH which leads to development and maturation of ovarian follicles and in turn the production of oestradiol. While this diagnostic test has been internally validated by some laboratory services, data from controlled, published studies on cats are lacking. (Receptal is not licensed for use in cats)

An in-clinic test that measures **LH levels** in serum has been developed by Synbiotics Corporation. The principle of this test is that spayed cats will have high levels of circulating LH due to loss of negative feedback to the pituitary upon removal of the ovaries. The test was developed for use in canines but a study of its application in cats has also been published. This study showed that the test is excellent at detecting intact queens (negative test result), but false positives (ie, falsely stating that a cat is spayed) may occur because of higher levels of LH during oestrus in intact females. Further large-scale, controlled studies are needed to



validate this test, especially since it is possible that a reduction of hypothalamic-pituitary function in cats during short-day (winter) months may affect its accuracy. The test is not currently available in the UK but can be ordered from Synbiotics Corporation in the United States, ([www.synbiotics.com](http://www.synbiotics.com)).

## References

Aronshohn MG & Faggella AM (1993). Surgical techniques for neutering 6- to 14-week-old kittens. *Journal of the American Veterinary Medical Association* **202**, 53 - 55

England GCW 1997, Confirmation of ovarian remnant syndrome in the queen using hCG administration. *Veterinary Record* **141**, 309-310.

Faggella AM & Aronshohn MG (1993). Anaesthetic techniques for neutering 6- to 14-week-old kittens. *Journal of the American Veterinary Medical Association* **202**, 56 - 62

Fettman MJ, Stanton CA, Banks LL, Hamar DW, Johnson DE, Hegstad RL and Johnston S (1997). Effects of neutering on bodyweight, metabolic rate and glucose tolerance of domestic cats. *Research in Veterinary Science* **62**, 131 - 136

Hart BL (1991) Effects of neutering and spaying on the behaviour of dogs and cats: questions and answers about practical concerns. *Journal of the American Veterinary Medical Association* **198**, 1204 - 1205.

Hawn R (1999) The debate over early-age neutering. *Feline Practice* Feb/March 9 - 13

Houlton J & McGlennon NJ (1992) Castration and physeal closure in the cat. *Veterinary Record* **131**, 466 - 467

Howe LM (1997) Short term results and complications of prepubertal gonadectomy in cats and dogs. *Journal of the American Veterinary Medical Association* **211**, 57 - 62

Johnston SD (1987) Questions and answers on the effects of surgically neutering dogs and cats. *Journal of the American Veterinary Medical Association* **198**, 1206 - 1214

Johnston SE (1998) Early neutering of the dog and cat: pros and cons. BSAVA Conference, Birmingham 107

Lieberman LL (1982) Advantages of early spaying and neutering (letter) (1982) *Journal of the American Veterinary Medical Association* **420**, 422, 434

Lieberman LL (1987) A case for neutering pups and kittens at two months of age. *Journal of the American Veterinary Medical Association* **191**, 518 - 521

Lieberman LL (1988) The optimum time for neutering surgery of dogs and cats. *Veterinary Record* **122**, 369

Loftstedt RM (2002), VanLeeuwen JA, Evaluation of a commercially available luteinizing hormone test for its ability to distinguish between ovariectomized and sexually intact bitches. *Journal of the American Veterinary Medical Association*, **220**, 1331-1335

Nishiyama T, Kinugasa T, Kimura T et al (1999). Determination of optimal time for mating by artificial insemination with chilled semen using luteinizing hormone surge as an indicator in beagles. *Journal of the American Animal Hospital Association* **35**, 348-352.

Olson PN & Shirley DJ (1999). New developments in small animal population control. *Journal of the American Veterinary Medical Association* **202**, 904 - 909

Romatowski J (1993) Early age neutering, an 'uncontrolled experiment' (letter). *Journal of the American Veterinary Medical Association* **203**, 1523

Root MV (1995) Early spay-neuter in the cat: Effect on development of obesity and metabolic rate. *Veterinary Clinical Nutrition* **2**, 132 - 134

Root MV, Johnston SD, Johnston GR & Olson PN (1995) *Veterinary Medicine and Surgery (Small Animal)* **10**, 8 - 12

LR Scebra, B Griffin (2003), Evaluation of a commercially available luteinizing hormone test to distinguish between ovariectomized and sexually intact queens. Research abstract at the 21st annual ACVIM forum, June 4-7.

Spain CV, Scarlett JM & Houpt KA (2004) Long-term risks and benefits of early-age gonadectomy in cats. *Journal of the American Veterinary Medical Association* **224**, 372 -379

Stubbs WP & Bloomberg MS (1995) Implications of early neutering in the dog and cat (review). *Seminars in Veterinary Medicine and Surgery (Small Animal)* **10**, 8 - 12

Stubbs WP, Bloomberg MS, Scruggs SL, Shille VM & Lane TJ (1996) Effects of prepubertal gonadectomy on physical and behavioural development in cats. *Journal of the American Veterinary Medical Association* **209**, 1864 - 1871.

Theran P (1993) Animal welfare forum: overpopulation of unwanted dogs and cats. Early age neutering of dogs and cats. *Journal of the American Veterinary Medical Association* **202**, 914 - 917

## Letters

Cardwell DL (1993) Pros and cons associated with early-age neutering. *Journal of the American Medical Association* **202**, 1789

Fingerlin E Jr (1994) Calls for verifiable studies on early-age spaying/neutering. *Journal of the American Veterinary Medical Association* **204**, 24 - 25

Gourlay J (1998) Early neutering of cats and dogs. *Veterinary Record* **142**, 228

Hart BL (1987) Early neutering of pups and kittens. *Journal of the American Veterinary Medical Association* **191**, 1181 - 1182

Herron MA (1972). The effect of prepubertal castration on the penile urethra of the cat. *Journal of the American Veterinary Medical Association* **160**, 208-11

Howe LM, Slater MR, Boothe HW, Hobson HP, Fossum TW, Spann AC, Wilkie WS (2000). Long-term outcome of gonadectomy performed at an early age or traditional age in cats. *Journal of the American Veterinary Medical Association*; **217**, 1661-5

Jagoe JA & Serpell JA (1988) Optimum time for neutering. *Veterinary Record* **122**, 447

Johnston L (1993) Opposes early-age neutering. *Journal of the American Veterinary Medical Association* **202**, 1041 - 1042

Lieberman LL (1988) Optimum time for neutering. *Veterinary Record* **122**, 591

Lieberman LL (1994) More on early-age neutering. *Journal of the American Veterinary Medical Association* **204**, 508

Macedo R (1993) More on early-age neutering. *Journal of the American Veterinary Medical Association* **203**, 782 - 783

Phillips I (1998) In favour of pediatric neutering. *Canadian Veterinary Journal* **39**, 397

Poole C (1998) Early neutering of cats and dogs. *Veterinary Record* **142**, 227 - 228



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