

Cat-Kind

Kitten neutering database



Neutering kittens at four months

A SUMMARY OF
THE EVIDENCE

Neutering is widely recognised as an effective way to reduce the number of accidental litters and unwanted cats being born in the UK, alongside other recognised benefits to cat health and behaviour. It is also the only certain way to prevent breeding, with alternatives such as containment and cat separation within the household often problematic and stressful for both owner and cat. Cat welfare charities neuter thousands of cats every year and yet despite this, and the efforts of all the subsidised neutering schemes run by all of the UK's rescue charities, the unwanted cat population remains of concern with not enough good homes for those cats that are in need. Shelters are often at capacity^{1,2} with many cats on rescue centre waiting lists², and stray and feral cats are commonly found in large numbers across localised areas³. Research shows that 78-80% of owners of female cats who have had one or more litters say that the litter was unplanned^{4,5} and that cat owners are largely unaware of the reproductive capacity of their pets⁴.

Historically, the timing of neutering has been at six months of age for owned cats. However, pregnancy can be seen in queens as young as four months of age⁶. Since 2006, neutering cats prepubertally at four months has been recommended by The Cat Group and subsequently supported by other animal welfare and veterinary organisations. A 2020 study found approximately half of UK-based veterinarians would recommend neutering client-owned cats at four months of age⁷. Therefore, Cat Kind (formerly the Cat Population Control Group) is calling for all veterinary practices to **promote and practice neutering at four months old** to reduce the number of unplanned litters.

Increasing uptake of four-month neutering

Historically, there have been some barriers within the veterinary profession relating to perceived risks of transitioning from six to four-month neutering.

This document provides a simple review of current available evidence on key areas of concern for neutering cats earlier than six months. While the recommendation is four months for owned cats, we note that some of the studies explore the effects of neutering at earlier ages.

This summary is intended to be a quick informative tool to enable key evidence to be incorporated into clinical practice. We have searched two databases and have only included published peer-reviewed work.

Surgical risks?

Short-term studies have identified no increased surgical risks associated with prepubertal neutering (during, immediately after and up to a week after neutering)⁸⁻¹⁰. Furthermore, neutering earlier (8-12 weeks of age) has the benefit of being more expedient, relative to neutering at 6-8 months⁹. This fact is probably due to the physiological differences between kittens and adult cats. For example, gonadal vessels are elastic and small, there is less abdominal and bursal fat which can help enable good visualisation and accurate haemostasis of small blood vessels and prepubertal ovaries have been found to be easily identified because of their relatively large size in comparison to the small size of the kitten⁹. It has also been reported that a smaller incision is required and use of intradermal absorbable skin sutures can reduce the need for Elizabethan collars and/or postoperative checks⁶. A lower rate of postoperative wound complications and less affective pain has also been documented following prepubertal neutering (<4 months) compared with neutering cats older than four months¹¹.

Anaesthetising younger kittens

Potential risks of anaesthetising young kittens, including hypothermia and hypoglycaemia, are now recognised and considerably reduced by published information on improved techniques and agents. Numerous studies have demonstrated that there is no increased risk of anaesthetic complications associated with desexing cats before puberty. One study found no significant anaesthetic complications in 96 kittens neutered between six and 16 weeks of age¹². Further studies found no difference in risk between early neutering compared to the traditional timing of neutering (around six months) provided appropriate measures are in place^{9,10}. Examples of these measures include withholding food for no more than 3-5 hours before surgery, offering food early in recovery, prevention of heat loss and 'the quad' anaesthetic combination of medetomidine, ketamine, buprenorphine and midazolam (unlicensed in combination but frequently and appropriately used under the Cascade; the Kitten Quad app which is available for free from www.kind.cats.org.uk helps calculation of doses). Research has shown that recovery from anaesthesia is faster in kittens (<6 months) compared to adults¹³.

Implications for the cat's behaviour?

Neutering is known to correlate with a decrease in sexually dimorphic behaviours, some of which may be considered undesirable by owners eg urine spraying, fighting. Studies that have followed up with owners between one and seven years post-adoption have found no significant differences in the behaviour of prepubertal neutered kittens compared with traditional age neutered kittens¹⁴⁻¹⁷. Where a difference has been found, it has indicated that there may be behavioural benefits to earlier neutering including reduced aggression towards vets in clinical settings¹⁸.

Growth and development?

Neutering at any age prior to physeal closure delays that closure and has been associated with significant lengthening of associated long bones found in some¹⁹, but not all studies²⁰. An additional study found a significant delay in closure for neutered male cats compared with entire males but no difference between entire and neutered females²¹. However, this lengthening has not been associated with prepubertal neutering specifically, with no difference in radial length between cats neutered at seven weeks and seven months^{19,22}. Additionally, no clinical relevance of delayed physeal closure has been demonstrated in cats neutered prepubertally ie this does not affect radius length²⁰, has not been associated with long-bone fractures¹⁸ or increased osteoporotic risks²⁰. A recent longitudinal study using prospective data reported cats that were entire at six months of age were twice as likely to have owner-reported early signs of degenerative joint disease when six years of age than cats that were neutered prior to six months²³. While we are unable to infer the mechanism behind this result, it does indicate no adverse effects of neutering cats prior to six months on their mobility at six years of age.

Urinary problems?

In prepubertal neutered cats, the external genitalia remain the size of their infantile appearance⁶. If prepubertal neutering can cause an underdevelopment of the genitals, and therefore of the urethral diameter, it is understandable that there have been concerns about potential risks of higher incidents of FLUTD in prepubertal neutered cats. However, numerous studies have failed to evidence a correlation between prepubertal neutering and increased risk of urinary problems. Specifically, cats neutered at seven weeks were not found at increased risk of a decrease in the diameter of the urethra at 22 months of age when compared to cats neutered at seven months²⁴. Additionally, there has been no difference found between cats neutered at 8-12 weeks compared to those neutered between 6-8 months in the increase in incidence of FLUTD or urethral obstruction in male cats two years post-neutering²⁵. Similar results were found when comparing cats neutered before and after 5.5 months, with no difference in incidence of FLUTD or urethral obstruction up to 11 years (median 3.9 years) post-neutering¹⁸. One study found a decrease in occurrence of FLUTD in earlier neutered cats (<24 weeks old)¹⁵.

Obesity

Neutering is a recognised risk factor for obesity. Metabolic rate has been shown to decrease in cats after neutering and neutered cats are more predisposed to obesity than entire cats²². However, longer-term studies that track cats in the years following surgery have not identified earlier neutering (< 5.5 months) as a risk factor for obesity relative to later neutering (> 5.5 months) when the cats were three years of age¹⁵ and up to 11 years (median 3.9 years) post-surgery¹⁸. Further studies compared cats neutered at seven weeks and seven months and found no difference between heat production (an indirect measure of calorimetry) at two years of age²⁶ and no difference in body weight or body condition score at one year of age²². A recent study found cats that were neutered at 31 weeks showed a rapid post-neuter increase in food intake compared to cats neutered earlier at 19 weeks, therefore from a weight management perspective the authors suggest neutering earlier may be beneficial²⁷. There is no evidence to suggest that cats neutered at four months are of increased risk of obesity relative to cats neutered when older. Instead, proactive dietary management of neutered cats is important irrespective of age when neutered.

Summary

Although all the studies have their limitations and further longitudinal data on owned cats would be valuable, overall the body of evidence suggests that neutering cats prepubertally has similar effects on physical and behavioural development and carries no greater risk of surgical or anaesthetic complications, compared with neutering at the more traditional age of six months or older. The perceived increased risks of surgery/anaesthesia are now considerably reduced by peer-reviewed information on improved techniques and agents. These data support the normalising of four-month neutering of owned cats, already performed by many veterinary surgeons. Pre-pubertal neutering is so important to prevent the incidence of accidental litters being born.

A number of charities are working together under the umbrella of Cat Kind to maximise the effectiveness of cat neutering through collaboration on research, joint projects and co-ordination of activities. We cannot achieve this without the help of vets.

- **Over 1470 veterinary practices are already signed up to the Kitten Neutering Database at www.kind.org/cats with a pledge to practice four-month neutering**
- **Both the BSAVA and BVA support prepubertal neutering (ie at four months of age rather than at the traditional six months of age)**

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Cat-KiND is an initiative from Cats Protection and respective members of Cat-KiND are detailed below:



Supporters of Cat-Kind:

Cats Protection Reg Charity 203644 (England and Wales) and SC037711 (Scotland)

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