

# Neutering kittens at four months

## A SUMMARY OF THE EVIDENCE

Neutering is widely recognised as the only acceptable and effective way to significantly reduce the number of unwanted cats being born in the UK. 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 cat population continues to increase. Research shows that 70 percent of owners of female cats who have had one or more litters say that the litter was unplanned<sup>1</sup> and that cat owners are largely unaware of the reproductive capacity of their pets<sup>2</sup>. Furthermore, research identified that owners delay neutering because of the incorrect belief that cats should be allowed to have a litter of kittens<sup>3</sup>.

Traditionally, 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 age. Therefore, the Cat Population Control Group (CPCG) is calling for veterinary practices to **promote and practise neutering at four months old** to reduce the number of unplanned litters.

### Perceived risks of kitten neutering

There remain some concerns within the veterinary profession about the perceived negative consequences of prepubertal neutering in cats. The key concerns and the evidence which puts at ease these concerns are summarised below.

#### Increased 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)<sup>4,5,6,7,8</sup>. Furthermore, neutering earlier (8-12 weeks of age) has the benefit of being more expedient<sup>5</sup>. 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 kitten<sup>5</sup>. 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 checks<sup>7</sup>. A lower rate of postoperative wound infections has also been documented following prepubertal neutering compared with traditional age neutering<sup>9</sup>.

#### Risks of 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. Examples of these 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; the Kitten Quad app which is available for free from [www.kind.cats.org.uk/](http://www.kind.cats.org.uk/) helps calculation of doses)<sup>10</sup>. Research has shown that recovery from anaesthesia is faster in kittens (<six months) compared to adults<sup>11</sup>.

#### 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 e.g. urine spraying, fighting<sup>12</sup>. Significant differences in the behaviour of prepubertal neutered kittens compared with traditional age neutered kittens have not been found<sup>13-16</sup>.

#### Problems with growth and development?

Neutering at any age prior to physeal closure delays that closure and is associated with statistically significant lengthening of associated long bones<sup>12-13</sup>. Distal radial physeal closure occurred approximately eight weeks later for cats neutered at seven weeks and seven months compared with intact cats<sup>17</sup>. However, this lengthening is not readily visible and no clinical relevance of delayed physeal closure has been demonstrated i.e. this does not affect adult size and has not been associated with adverse consequences<sup>12, 17, 18</sup>.

#### Increased risk of feline urinary tract disease (FLUTD)?

In postpubertal neutered cats, the external genitalia remain the size of their infantile appearance<sup>7</sup>. 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 neutering of any age and a decrease in the diameter of the urethra or an increase in incidence of FLUTD, with or without urethral obstruction<sup>12,13,17,18</sup>. One study even found a decrease in occurrence of FLUTD in earlier neutered cats (<24 weeks old)<sup>15</sup>.

#### Increased risk of obesity?

Neutering is a commonly associated risk factor for obesity. Metabolic rate has been shown to decrease in cats after neutering, and cats neutered at seven weeks or seven months were found to have higher body mass, body condition score, and increased falciform fat, in comparison with intact cats<sup>15</sup>. However, prepubertal neutering has not been shown to increase the risk of obesity in comparison to neutering at the traditional age. A long-term study found no correlation between age at neutering and obesity<sup>18</sup> and a recent study suggested that earlier neutering may aid healthy weight management through growth when regulating intake to maintain an ideal body condition score<sup>19</sup>.

### Summary

Overall, evidence shows that neutering earlier than six months (and as early as seven weeks) has no negative developmental, health or behavioural consequences. The perceived increased risks of surgery/anaesthesia are now considerably reduced by published information on improved techniques and agents.

A number of charities are working together under the umbrella of the Cat Population Control Group (CPCG) 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 1,470 veterinary practices are already signed up to the Kitten Neutering Database at [www.kind.org/cats](http://www.kind.org/cats) with a pledge to practice four month neutering.
- Both the BSAVA and BVA support prepubertal neutering (i.e. at four months of age rather than at the traditional six months of age).

## References

1. PDSA (2017) PDSA Animal Wellbeing Report 2017. Available at: [www.pdsa.org.uk/media/3291/pdsa-paw-report-2017\\_printable-1.pdf](http://www.pdsa.org.uk/media/3291/pdsa-paw-report-2017_printable-1.pdf)
2. Welsh, C.P., Gruffydd-Jones, T.J., Murray, J.K. (2014) Poor owner knowledge of feline reproduction contributes to the high proportion of accidental litters born to UK pet cats. *Veterinary Record* 174, 118
3. RSPCA (2014) Tackling the cat crisis. A collaborative approach to neutering. Available at: [www.rspca.org.uk/adviceandwelfare/pets/cats/health/neutering](http://www.rspca.org.uk/adviceandwelfare/pets/cats/health/neutering)
4. Roberts, M.L., Beatty, J.A., Dhand, N.K., Barrs, V.R. (2015) Effect of age and surgical approach on perioperative wound complication following ovariohysterectomy in shelter-housed cats in Australia. *Journal of Feline Medicine and Surgery Open Reports*. Available at <http://journals.sagepub.com/doi/10.1177/2055116915613358>
5. Porters, N., Polis, I., Moons, C.P.H., I., R., Duchateau, L., Goethals, K., Huyghe, H. de Rooster. (2014) Prepubertal gonadectomy in cats: different surgical techniques and comparison with gonadectomy at traditional age. *Veterinary Record* 175, 223
6. Bessant, C. (2014) Vets' crucial role to reduce number of unwanted cats. *Veterinary TIMES*. Available at: [www.vettimes.co.uk/article/vets-crucial-role-to-reduce-number-of-unwanted-cats/](http://www.vettimes.co.uk/article/vets-crucial-role-to-reduce-number-of-unwanted-cats/)
7. Joyce, A. and Yates, D. (2011) Help stop teenage pregnancy! Early neutering in cats. *Journal of Feline Medicine and Surgery* 13, 3-10
8. Howe, L.M. (1997) Short term results and complications of prepubertal gonadectomy in cats and dogs. *Journal of the American Veterinary Medical Association* 211, 57-62
9. Aronshohn, M.G. and Faggella, A.M. (1993) Surgical techniques for neutering 6- to 14-week-old kittens. *Journal of the American Veterinary Medical Association* 202, 53-55
10. Welsh, P (No date) Neutering pet cats at four months of age (or less). *The Feline Centre Langford, Feline Update Online*. Available at: [www.langfordvets.co.uk/sites/default/files/Neutering%20article%20revised%20300413.pdf](http://www.langfordvets.co.uk/sites/default/files/Neutering%20article%20revised%20300413.pdf)
11. Bruniges, N., Taylor, P.M., Yates, D (2015) Injectable anaesthesia for adult cat and kitten castration: effects of medetomidine, dexmedetomidine and atipamezole on recovery. *Journal of Feline Medicine and Surgery* 18(11), 860-867
12. Root Kustritz, M.V. (2007) Determining the optimal age for gonadectomy of dogs and cats. *Journal of the American Veterinary Medical Association* 231(11), 1665-1675
13. Porters, N., Polis, I., Moons, C.P.H., Van de Maele, I., Ducatelle, R., Goethals, K., Duchateau, L., de Rooster, H.(2015) Relationship between age at gonadectomy and health problems in kittens adopted from shelters. *Veterinary Record* 176, 572
14. Wright, J.C. and Amoss, R.T. 2004) Prevalence of house soiling and aggression in kittens during the first year after adoption from a humane society. *Journal of the American Veterinary Medical Association* 224(11), 1790-1795
15. Howe L. M., Slater M. R., Boothe H. W., Hobson H. P., Fossum T. W., Spann A. C., Wilkie W. S. (2000) Long-term outcome of gonadectomy performed at an early age or traditional age in cats. *Journal of the American Veterinary Medical Association* 217(11), 1661-1665
16. Stubbs W. P., Bloomberg M. S., Scruggs S. L., Shille V. M., Lane T. J. (1996). Effects of prepubertal Gonadectomy on physical and behavioral development in cats. *Journal of the American Veterinary Medical Association* 209(11), 1864-1871
17. Root, M.V., Johnston, S.D., Olson, P.N. (1997) The effect of prepubertal and postpubertal gonadectomy on radial physeal closure in the male and female domestic cat. *Vet Radiol Ultrasound* 38, 42-47
18. Spain, C.V., Scarlett, J.M., Houpt, K.A. (2004) Long term risks and benefits of early age neutering in cats. *Journal of the American Veterinary Medical Association* 224, 372-80
19. Allaway, D., Gilham, M., Colyer, A., Morris, P.J. (2017) The impact of time of neutering on weight gain and energy intake in female kittens. *Journal of Nutritional Science*. Available at: [www.ncbi.nlm.nih.gov/pubmed/28630696](http://www.ncbi.nlm.nih.gov/pubmed/28630696)

