



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

Assessment of feline neutered status

February 2013

The following guidance may be helpful for vets being asked to appraise the neutered status of cats in the care of Cats Protection (CP), and/or where there are suspicions of cryptorchidism or 'ovarian remnant syndrome.'

Male cats

Options	Comments	CP preferred options for CP cats
Physical assessment of scrotal region	Presence of testicles indicates entire status, but absence of testicles does not necessarily confirm neutered status – it can be useful to consider previous veterinary and owner history, size of empty scrotum, evidence of recent surgery, age, and other traits of entire status.	√
Entire traits	Male head/face shape, odour of urine, behaviour, stud tail	√
Presence of penile spines	Usually start to develop at 12 weeks of age and are usually fully present by five to six months of age. Start to disappear within two weeks of neutering and are fully regressed within six to eight weeks of neutering. May falsely indicate a neutered status in a very young entire male which has not yet developed penile spines. May falsely indicate an entire status in a recently neutered male in which penile spines have not yet regressed – check for evidence of recent surgery	√
Testosterone assay	Functional testicular tissue produces testosterone. High levels suggest presence of functional testicular tissue. However, testosterone levels may vary and a low level may be present in an entire adult male as well as in young entire males which have not yet reached puberty.	
Stimulation test (HCG/GnRH)	Stimulation of functional testicular tissue leads to a rise in testosterone levels. More reliable than single testosterone assay, but again may falsely indicate a neutered status in young entire males which have not yet reached puberty. Drugs not licensed for use in cats	√ - if an entire status is suspected and external testicles are not apparent – it may be useful if exploratory laparotomy is contraindicated and/or the veterinary history indicates the cat has already been neutered

Exploratory surgery	Usually confirms neutered status, but may be unnecessary if cat is already neutered (anorchidism is extremely rare in cats)	√ - if physical examination and or behaviour suggest exploratory laparotomy is indicated
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Female cats

Options	Comments	CP Preferred options for CP cats
Evidence of lactation	Lactation is suggestive of entire status, but absence of lactation is obviously not confirmative of neutered status	√
Palpation for pregnancy	Pregnancy is confirmative of entire status, but absence of pregnancy is obviously not confirmative of neutered status	√
Monitor behaviour	Oestrus activity recurs every two to three weeks in non-gravid entire sexually mature females generally through spring, summer and autumn. However, this is reliant on good observational skills and/or flexibility to examine the cat during this time for response to manual stimulation of the hindquarters (appraising for signs of oestrus, including tail deflection, spinal flexion, rubbing/rolling, vocalisation, treading of the hind legs, body or tail tremor and rigidity)	
Vaginal cytology	Cornified epithelial cells are present in entire queens during oestrus – multiple samples may be needed and/or good observational skills and flexibility to examine the cat during this time	
Ultrasonography	A high level of skill is required to confirm or discount entire status in a non-gravid queen	
Shave for spay scar	The left flank, then the right flank and then the midline should be shaved to look for a scar suggestive of neutering – such scars are often more apparent if a small quantity of surgical spirit is applied to the skin. On occasion, queens which have scars suggestive of neutered status go on to show signs of oestrus or develop pregnancy. However, if a strongly suggestive scar is found, new owners should be advised that the cat is presumed neutered. If no such obvious scar is found and the neuter status remains unknown, an exploratory laparotomy should be performed	√
Oestradiol assay	Oestradiol is at its peak when an entire queen is showing oestrus behaviour, however a low level may be present in an entire queen during anoestrus (winter) or during the inter-oestrus interval – not a useful test alone	
Stimulation tests (hCG, GnRH)	hCG injection must be given one to three days after the onset of oestrus behaviour and the cat resampled seven days later to assess progesterone	

	<p>levels, so not a useful test alone GnRH injection leads to an oestradiol surge three hours later, but data from controlled, published studies on cats are lacking Neither hCG nor GnRH are licensed for use in cats</p>	
LH assay	<p>Negative feedback from the ovaries of an entire cat is proposed to maintain LH at basal levels and so a low LH confirms an entire cat. However, entire cats during the breeding season will have LH surges at ovulation and LH changes during follicular development during pregnancy. A single high result may not confirm a neutered cat - false positives (falsely indicating that a cat is neutered) may occur. Furthermore it is unclear whether entire queens will maintain low LH levels during anoestrus (winter) when ovaries become acquiescent. Further research on the practical use of this test is needed</p>	
Exploratory laparotomy	Usually confirms neutered status	√ - if no spay scar is found

Oestrus behaviour in neutered queens, including ovarian remnant syndrome

Unneutered female cats, and those with ovarian remnants following neutering, continue to show seasonal oestrus behaviour, with 'heat cycles' every two to three weeks in spring, summer and autumn, but typically not in winter. Some of the options for assessment of neutered status detailed above may be useful for identifying female cats with ovarian remnants following neutering.

Surgery is the most common approach to the confirmation and management of cats with ovarian remnants. If surgery is performed to explore for ovarian remnants (often found at the ovarian pedicles), timing this to be during the dioestrus period of the cat's oestrus cycle, just after (induced) ovulation can make the remnants easier to see as the ovarian tissue may have corpora lutea nodules grossly evident at this time.

Some cases of 'ovarian remnant syndrome' are proposed to be due to additional ovarian tissue found away from the normal surgical sites, although evidence of this is unclear.

Other possible causes of 'heat-like' behaviour has been reported in neutered cats following contact with human skin to which Hormone Replacement Therapy (HRT) cream or spray has been applied.