Canine Catch-Neuter-Return (CNR) Good Practice Guides

Good standards of practice in anaesthesia and analgesia – Clinical assessment and pre-medication

Learning Outcomes:

1. Discuss what to look for and record during the pre-anaesthetic exam
2. Discuss the recommendations for fasting and water provision prior to surgery
3. Explain why anaesthesia is required for neuter surgery and outline the four stages of anaesthesia
4. Explain the recommended environment, handling and injection site for injection of pre-medication

Clinical examination

The decision to perform neuter surgery on each individual dog must be carefully considered. The benefits of neutering must outweigh the risks of the surgery and anaesthetic to the dog. In order to minimise the risk of anaesthetic complications and death, all dogs should have a pre-anaesthetic examination by a veterinary surgeon. The veterinary surgeon should be capable of dealing with the range of pathologies which may present within the context of a CNR programme – for example trauma, infectious disease or degenerative disease. If the examination suggests the animal may be infectious, it must be isolated in a designated isolation area and not be allowed to contact or share the same environment as non-infectious animals, appropriate triage and treatment should be given. Rabid animals should be isolated and safely and humanely euthanised.

These free-roaming street dogs are not used to being handled by people and so the clinical exam may need to be done from a distance. But we can still tell a lot about a dog by looking at it.

- Does the dog have any obvious discharge from the nose or eyes which could indicate disease?
- Is the dog's breathing rate within normal limits and is the breathing pattern normal or laboured?
- Does the dog have any obvious lameness? Which could indicate a wound or a fracture?
- What is the body condition of the dog? If the dog is very thin, this may suggest other disease processes. The dog's body condition will also alter drug distribution and how well the dog will regulate body temperature.
- If the dog has many skin parasites, there is the risk that the dog may also have haemoparasites and anaemia.

A dog with a transmissible veneral tumour on its genitals

- Does the dog have any signs of TVT around its genitals or face?
- If male, are both testes present and descended?
- If female are there any signs of lactation?
- Or any discharge from the vulva which may indicate pathology?

If the dog is amenable to being handled without causing it to become stressed, a baseline heart rate, respiratory rate, pulse rate and quality, mucous membrane colour and hydration status should be assessed and recorded on the patient record. Most anaesthetic drugs are excreted by the kidneys so if the dog is dehydrated, the kidneys will already be working harder than normal and the dog won't be able to excrete the drugs as effectively. If the dehydration is severe, this could lead to

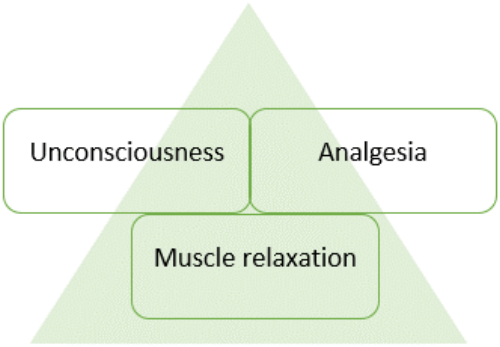
hypovolemic shock where there is a reduced blood volume to supply all the vital organs with oxygenated blood. Assessing the dog in this way will also identify if the dog is in septic shock, for example from pyometra. Identifying the pyometra at this stage will affect how the dog is prepared for surgery, and whether the dog needs to be stabilised with fluid therapy prior to undergoing surgery. If the clinical exam reveals signs of disease or injury then the dog's suitability for neuter surgery should be re-assessed, for example high ectoparasitic load or presence of open wounds. Every dog should be weighed where possible to enable accurate drug dosage calculations, to prevent under and over-dosing of drugs. However, it is important to minimise stress to the dog as much as possible, so often an estimated weight is used for calculating the volume of pre-medication and then when the dog is sedated it can be weighed before induction of anaesthesia.

Dogs should be fasted for 4-6 hours prior to anaesthesia to reduce the risk of regurgitation and aspiration while anaesthetised. With these free-roaming street dogs caught the morning of the surgery, there is no way of determining when they last ate so there is an unknown risk of regurgitation, as the risk of regurgitation also increases if the dog has been fasted for longer than 10hours. Many projects use the drug xylazine in their premedication. This drug induces vomiting in many dogs prior to unconsciousness, but not in every dog and does not entirely remove the risk of aspiration. No food should be available to the dogs between being caught and being anaesthetised, unless this period is greater than 10 hours, for example dogs caught the day prior to surgery should receive an evening meal. Water should always be provided up until pre-medication to reduce the risk of dehydration. Always remove any water bowls from areas where dogs have been pre-medicated as there is the risk of sedated dogs aspirating or drowning. For puppies less than 4 months of age, it is recommended that a small meal should be fed 2 to 4 hours before surgery, and food should not be withheld for more than 4 hours before surgery.

Stages of anaesthesia

Anaesthesia is a requirement for neuter surgery, but there are risks and side effects of each of the drugs used in anaesthesia and these risks will increase if the dog is unwell.

The aims of anaesthesia are:



- Prevent awareness of painful stimuli – analgesia
- Prevent the dog moving during surgery - muscle relaxation
- For good operating conditions and staff safety – unconsciousness

Multi-modal anaesthesia is recommended. Multi-modal means using several different drugs, which work together to provide surgical anaesthesia, analgesia, muscle relaxation and a reduction in anxiety. No one drug will meet all of these requirements and by using a combination of drugs which

complement each other, it enables the use of lower doses of each individual drug, thus reducing the potential for side effects. There are four stages of anaesthesia:

1. Pre-anaesthetic medication (called pre-medication) - Should provide pre-emptive analgesia, reduce anxiety and cause muscle relaxation.
2. Induction - Anaesthesia is induced using an anaesthetic drug to ensure the dog is in a state of surgical anaesthesia.
3. Maintenance - Surgical anaesthetic state must be maintained until the surgeon finishes their last suture, and it can be maintained using an injectable anaesthetic drug or using gaseous anaesthesia.
4. Recovery - No further anaesthetic drugs should be required at this stage, although further analgesia may be required if the dog expresses pain behaviours.

Surveys studying anaesthetic deaths in dogs and cats in the UK identified that the significant risk factors to these animals during anaesthesia are:

- Poor pre-anaesthetic assessment
- Higher risk if trachea or airway is not intubated
- Lack of observation/monitoring of the animal during anaesthesia

Though studies have not been carried out specifically in CNR programmes, it is likely that these will also be the main risk factors for dogs undergoing anaesthesia for neuter surgery.

Appropriate records pertaining to anaesthesia should be maintained. Where possible the anaesthesic records should be periodically audited by the veterinary surgeons to ensure that anaesthetic standards are appropriate. Anaesthetic deaths should be minimised through conscientious management of anaesthetic and any deaths under anaesthesia should be recorded and investigated.

In order to ensure a minimum standard of quality anaesthesia, every veterinarian who administers anaesthesia should be able to fulfil the following five basic requirements:

1. Ensure the animal's airway is patent
2. Administer oxygen
3. Perform manual, intermittent positive pressure ventilation (IPPV) (e.g. using an Ambu- bag, or an anaesthetic breathing system)
4. Administer IV drugs and fluids, venous access should be secured – ideally with an IV catheter
5. Perform basic Cardio-Pulmonary Resuscitation (CPR)

This means that all veterinarians should be proficient in the techniques of intubation, intravenous catheterisation, oxygenation and manual ventilation. A safe anaesthetist should be prepared for every procedure – ask yourself the following questions:

- Do I have everything required to ensure tracheal intubation?
- Do I have enough oxygen and is the equipment ready to deliver it?
- Can I immediately perform manual IPPV?
- Can I administer intravenous drugs and/or fluids, i.e. is the intravenous catheter in place and functional? If not, is everything ready to gain IV access after induction?
- Is a CPR procedure in place and are the emergency drugs available?

Remember there are no safe anaesthetics – only safe anaesthetists!

There must be protocols in place to identify and select appropriate dogs to be caught for a CNR programme, but not all injuries can be accurately assessed prior to capture and transport to the clinic. This is why it is importance to perform a clinical assessment of each dog once at the clinic.

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Pre-medication

All dogs should receive pre-operative medication which includes sedation and analgesia, thus reducing the volume of anaesthetic needed, facilitating better anaesthetic control, reducing patient stress, and enabling humane handling.

A pre-medication will decrease the sensitivity of the central nervous system therefore enhancing the effect of the anaesthetic agent, allowing us to reduce the induction and maintenance doses of our anaesthetic agents and thereby reduce any side-effects. It is important to note that central nervous system activity is also reduced by wasting disease, age and shock, and increased with fear and pain. This has to be taken into consideration on an individual basis when calculating dose rates.

The pre-medication injection should be administered intramuscularly (IM), into the cervical or lumbar epaxial muscles located either side of the spine. These locations are less painful for injection than the quadriceps, and pose less risk of side effects than if injecting into the hamstrings. Before approaching the dog to pre-medicate, assess the dog's behaviour and body language. The pre-medication must be performed with as minimal stress as possible, as if the dog is stressed, the central nervous system activity will be increased, and the pre-medication will have a reduced effect. Assess each situation individually and different techniques for handling dogs will be required for different dogs.

IM injection into cervical epaxial muscles

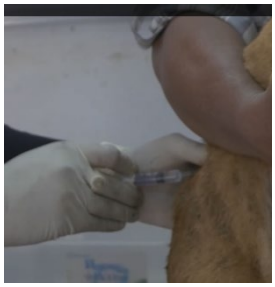
The first finger is placed along the dog's spine to protect it from being accidentally injected. The thumb is then used to make an L shape and the injection is given into the cervical epaxial muscle in the space created.



IM injection into lumbar epaxial muscles

The first finger is placed along the dog's spine to protect it from being accidentally injected. The thumb is then used to make an L shape and the injection is given into the lumbar epaxial muscle in the space created.





Once the dog is pre-medicated, every effort should be made to minimise stimulation of the dog. Keeping the dog in a quiet, dark environment with minimal handling will allow the sedative to take effect more rapidly and effectively. This, in turn, can reduce the dosages of induction agents used and provide better anaesthesia.

Checklist:

- ✓ Poor pre-anaesthetic exam increases anaesthetic risk
- ✓ Weigh dog for accurate drug dosing
- ✓ Provide drinking water until pre-medication injection
- ✓ Minimal stress handling for administration of pre-medication

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