

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

### Good aseptic techniques and sterility - Introduction and the surgical area

#### Learning Outcomes:

1. Describe what the terms aseptic technique and sterility mean
2. Outline the sources of contamination which can increase the risk of peri-operative infection
3. Review the requirements of a surgical area to minimise contamination

#### Glossary:

- **Surgical sepsis** - The exclusion of all pathogenic microorganisms that produce sepsis or septic disease, before they enter an open surgical wound or contaminate a sterile field during surgery.
- **Aseptic technique** - All activities which limit microbial contamination to prevent infection arising. We primarily do this in a surgical context by using appropriate disinfection and sterilisation techniques.
- **Sterilisation** - The destruction of all microorganisms (bacteria, viruses, spores) on an item. Usually refers to objects such as surgical instruments, drapes and swabs. Sterile items will only remain sterile if handled and stored correctly.
- **Sterile surgical field** – Includes all items which have been sterilised and handled in order to maintain sterility, namely the drape over the dog exposing only the surgically prepared skin of the dog, the instrument kit, and surgeon's sterile gloved hands.
- **Sterile technique** - Techniques used in the surgical field to reduce exposure to microorganisms.
- **Disinfection** - The destruction of most pathogenic organisms on inanimate (not living) objects such as surgical equipment and the surgical environment.
- **Antiseptics** - The destruction of microorganism during patient skin preparation and scrubbing. This does not mean the skin has been sterilised – this is not possible on a living animal.

Bacterial infection is a potentially devastating complication of surgery. It will be painful for the dog, and will require a longer stay in the kennel environment, further treatment, medication and potentially even further surgery may be required. This can be expensive, and is stressful for the dog. If not detected prior to release, infection can cause catastrophic wound breakdown and even death in free-roaming dogs.

Fortunately, the risks of bacterial infection can be managed by ensuring good aseptic technique; aseptic technique means using practices and procedures to prevent wound contamination with pathogens. There is no substitute for good aseptic technique, no antibiotic will be effective at removing the risk of peri-operative infection due to poor hygiene standards – as with many things prevention is better than cure!

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Even with adequate asepsis, post-operative infection rates of between 3–10% are reported in dogs undergoing surgery. This risk may be considerably higher in populations of free-roaming dogs of unknown health status, and especially if aseptic techniques are not maintained, or appropriate analgesia is not given.

Examples:



Abdominal wound breakdown

- Suture failure due to infection.
- No granulation tissue to indicate adequate wound healing.
- Total wound breakdown and abdominal contents exposed.
- The dog will be painful.



Inflammation around the wound

- Inflammation around the wound.
- Infection indicated.
- Wound healing will not take place.
- The dog will be painful.

The sources of contamination leading to peri-operative infection include:

- Environmental. E.g. dust on surfaces or carried in the air,
- People. E.g. through direct contact with the surgical field, or through respiratory droplets (due to speaking, coughing), or hair or clothing contamination



Objects. E.g. by the use of non-sterile objects such as unsterile gloves or surgical instruments

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- The patient. E.g. Inadequate preparation of the dog's skin or hair.

Based on these sources of contamination, there are four key areas where we need to think about aseptic technique and sterility to minimise the risks of peri-operative infection:

1. Environment - designated cleaning protocol for the operating room and a separate preparation area for hair removal and surgical preparation of the dogs
2. Staff - clothing, behaviour, hand hygiene, sterile gloving
3. Surgical instruments and drapes - cleaning, packing and sterilisation of surgical kits
4. Patient preparation – removal of hair and surgical preparation of the skin on the dog

### The surgical area

There must be a separate preparation area and surgical area. This is because the dog's hair and skin are a source of contamination and so the hair must be removed, and the skin disinfected before the dog is brought through to the surgical area. In this way the hair and dirt from the dog remains behind in the preparation area and the surgical area is kept clean.



A dog being prepared for surgery in the preparation area.

The separate operating room should be an enclosed room so that the weather and dust do not contaminate the area. It should be positioned in such a way to minimise the number of people able to go into and out of it unless appropriately clothed and experienced.



Veterinary surgeons and assistants working in the separate operating room.

You should never need to walk through the operating room in order to access another part of the clinic. Contamination can be from the air, staff and from the patients. The risk of contamination to the sterile surgical field will increase if there is a lot of movement of people into and out of the surgical area. In order to minimise movement into and out of the surgical area, all equipment



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required during surgery such as replacement intravenous cannulas, and anaesthetic drugs for maintenance of anaesthesia, must be available within the room.

It is imperative that the operating room is cleaned each day before surgeries begin, surfaces should also be cleaned in between each surgery and the whole room cleaned after all surgeries have been completed. Most bacteria and infectious material cannot be seen with the naked eye and so making sure everything is cleaned with effective cleaning products used to the correct dilution, will ensure you have done everything you can do to minimise the risk of the sterile field being compromised. Begin cleaning by focusing on the 'cleanest' objects, in the case of the surgical area, this would be the surgical table and any surgical light fitting. These objects will be nearest to the dog and therefore the sterile field. Every surface will collect dust, and this could fall into the sterile field and cause infection if not cleaned appropriately. Following this, all other areas of the room should be cleaned, and stock should be checked. Re-useable equipment such as anaesthetic circuits should be disinfected each day.

A formal cleaning protocol should be written for all staff to refer to, to ensure the room and equipment used are cleaned appropriately.

Example of a cleaning protocol for the surgical area:

Task (Initial once done)	Monday	Tuesday	Wednesday	Thursday	Friday
Check there are clean scrubs and surgical shoes available for all staff to use – If not, clean and prepare surgical attire					
Clean from top down with disinfectant: -Lights -Walls -Doors -All horizontal surfaces					
Clean rubber mats/replace wet or dirty cardboard/newspaper on surgical tables					
Empty and prepare all bins for use					
Sweep and disinfect floors					
Check stock -Emergency crash box -Suture material -Sterile needles -Scalpel blades -Sterile gloves					
Check sufficient sterile surgical kits available – if not, sterilise more surgical kits					
Check anaesthetic machine: -ensure sufficient oxygen connected -Leak test circuits -Check the vaporiser is full Ensure endotracheal tubes are clean and available					



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### Checklist:

- ✓ Infection is a potentially devastating complication of surgery.
- ✓ No antibiotic will replace the need for good standards of asepsis.
- ✓ Aseptic technique describes all activities which limit microbial contamination.
- ✓ Sterilisation is the destruction of all microorganisms (bacteria, viruses, spores) on an item.
- ✓ Sources of contamination = environment, people, instruments, dog.
- ✓ Separate and enclosed surgical area away from preparation area.
- ✓ The surgical area must be kept clean and organised at all times.

### References:

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