Contamination control: part 2 – a vet nurse’s critical role

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Categories: Practical, RVNs

Date: April 26, 2016

The infection control measures discussed in the first part of this article (VNT15.12) are not where the veterinary nurse’s role in infection control ends.

Using a daily tick sheet allows staff to quickly identify gaps in cleaning and ensure good infection control discipline. Image: © Fotolia/Andrey Popov.

In addition to maintaining good theatre discipline, protocols should be in place to prevent the spread of infectious disease across all areas of the practice.

How disease is spread

To recap on how disease is spread, pathogens leave their hosts via urine, faeces, blood, vomit, saliva, skin and nasal and/or ocular discharges.

These pathogens are transmitted to a new host through direct contact with an infected animal, indirect contact (through an inanimate object, such as a water bowl), aerosol transmission, contaminated food/water or through a carrier animal (Dallas et al, 2007).

A carrier may be healthy, with no clinical signs, or may have previously shown clinical signs and recovered from infection. This is known as a convalescent carrier (Dallas et al, 2007).
Once the pathogen has entered the new host, it must overcome the host’s immune system for infection to take hold. A host’s susceptibility to infection depends on several factors, including age, body condition, vaccination status, presence of any wounds, immune response and white blood cell activity (Dallas et al, 2007). A patient’s susceptibility to infection must be considered when designing and implementing an infection control protocol.

Hospital environment

The hospitalisation area includes the dog and cat wards, isolation ward, utility/washing area and high-dependency/intensive care ward. Prevention of the spread of disease is paramount and this should be kept in mind when designing the area. The cat and dog wards should be kept separate, and a recovery and/or high-dependency ward should be near to the preparation area to allow for constant patient monitoring when required.

World Health Organization hand washing guidelines.

The isolation ward, meanwhile, must be kept separate to all other hospitalisation areas and have its
own supply of bedding, personal protective equipment, food and water bowls, litter trays and other consumables. It should also have its own external door allowing animals to be transported to isolation without having to travel through other wards.

All wards should be easy to clean, with minimal furniture where dust could build up, as well as closed storage cupboards, washable walls and floors with coving (to avoid buildup of dirt in cracks and crevices). Kennels should also be made of an impervious and strong material, such as stainless steel.

Kennels should not be placed directly facing each other to help prevent transmission of airborne pathogens and all areas should be well-ventilated to reduce transmission of airborne infection. Extractor fans and vents or air conditioning systems will maintain a cycle of clean air (Scorer, 2006).

**Cleaning and disinfection**

Maintaining a clean and hygienic hospitalisation area is vital to removing pathogens, maintaining inpatient welfare and promoting a good working environment for staff. The wards should have their own supply of cleaning products not used for the rest of the surgery and isolation should have a supply of its own.

Cleaning protocols must be established for all areas; using a daily tick sheet allows staff to quickly identify gaps in cleaning and ensure good infection control discipline.

All bedding, equipment and used kennels must be thoroughly cleaned after each patient is discharged, while all floors, surfaces and high-risk areas, such as door handles, light switches and plug sockets, should be cleaned daily. Walls should be spot-cleaned and a weekly deep clean – including all walls – should take place of the entire hospitalisation area.

Many different disinfectants are available for use in veterinary practice and an overview of common products is detailed in Table 1. Whichever product is used, it is important to remove organic matter prior to disinfection and follow manufacturers’ guidelines on dilution and water temperature. Solutions should also be replenished regularly to avoid denaturing and large volumes are best to reduce contamination (Scorer, 2006).

**Barrier nursing**

Barrier nursing protocols are a specific set of nursing requirements for infectious patients. These steps create a barrier against infection by preventing transmission to a fomite, such as cleaning equipment or the nurse’s clothing (Dingle and Rock, 2006).

The fundamentals of these requirements are:
• keeping the patient isolated from other animals
• treating all other patients before the infectious patient (see biosecurity policy)
• ensuring the patient remains in the same kennel throughout its stay
• using separate equipment, such as food bowls and thermometers, for each patient
• wearing a disposable gown, gloves, mask and shoe covers/foot bath when nursing patients
• keeping the patient’s waste and used bedding separate to that for general use
• soaking equipment in disinfectant at the required dilution and contact time after being used
• thoroughly disinfecting all areas after use (Dingle and Rock, 2006)

Hand hygiene

Table 1. Common disinfectant properties. (The author amended this table, which was reprinted in VNT16.05, correcting some information. The table here is the latest version).

<table>
<thead>
<tr>
<th>Product (Trade)</th>
<th>Use</th>
<th>Classification</th>
<th>Efficacy</th>
<th>Contact Time (min)</th>
<th>Dilution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ancel (Triage)</td>
<td>Surface disinfectant</td>
<td>Quaternary ammonium compounds; biguanide</td>
<td>Bactericidal, virucidal, fungicidal and mycobactericidal</td>
<td>5</td>
<td>1200 to 4000 for low-risk; 1000 to 2000 for high-risk</td>
</tr>
<tr>
<td>Virkon Professional</td>
<td>Surface disinfectant</td>
<td>Oxidising agents</td>
<td>Bactericidal, virucidal and fungicidal</td>
<td>10 (including pre-rinse)</td>
<td>1000 for high-risk; 1200 for low-risk</td>
</tr>
<tr>
<td>Vetaclean</td>
<td>Surface disinfectant</td>
<td>Quaternary ammonium compounds</td>
<td>Bactericidal, virucidal and fungicidal</td>
<td>5</td>
<td>1200</td>
</tr>
<tr>
<td>Vetaclean</td>
<td>Surface disinfectant</td>
<td>Quaternary ammonium compounds; alcohols; phenols</td>
<td>Bactericidal, virucidal, fungicidal and sporicidal</td>
<td>1 hour</td>
<td>1000 for low-risk; 150 for high-risk; 125 for panoviruses</td>
</tr>
<tr>
<td>Arigene</td>
<td>Surface disinfectant</td>
<td>Quaternary ammonium compounds; biguanide</td>
<td>Bactericidal, virucidal, fungicidal, mycobactericidal and sporicidal</td>
<td>5</td>
<td>1100 for low-risk; 150 for high-risk</td>
</tr>
<tr>
<td>Swift/Falcon</td>
<td>Surface disinfectant</td>
<td>Chloramines</td>
<td>Bactericidal, virucidal, sporicidal and mycobactericidal</td>
<td>Swift: 5 min; Falcon: 30 sec</td>
<td>Swift: 1 sachet per 5 l water; Falcon: ready-to-use spray</td>
</tr>
<tr>
<td>Ainetel</td>
<td>Airborne disinfectant</td>
<td>Quaternary ammonium compounds; alcohols; phenols</td>
<td>Bactericidal, virucidal and mycobactericidal</td>
<td>1 hour</td>
<td>1 x 300ml can per 150 cubic metres or 1 x 50ml can per 40 cubic metres</td>
</tr>
</tbody>
</table>

This table is intended for reference purposes only. Manufacturers’ guidelines should be followed for specific biosecurity challenges.

Table 1. Common disinfectant properties. (The author amended this table, which was reprinted in VNT16.05, correcting some information. The table here is the latest version).

One of the biggest steps the veterinary team can take to reduce infection is to practise good hand hygiene. However, it is a difficult step to enforce across a team (O’Dwyer, 2013).

To maximise adherence to hand hygiene protocols, regular staff training on its importance is suggested (O’Dwyer, 2013), as is having many easily accessible hand wash and alcohol gel rub stations.

As discussed in part one of this article, common hand disinfectants used in practice are chlorhexidine gluconate, povidone-iodine and alcohol gel.

Soiled hands should always be washed prior to application of alcohol gel to avoid denaturing of the alcohol and hands should be washed or have an alcohol rub applied in between handling each patient.
The World Health Organization (2006) hand washing guidelines (see diagram) should be followed when applying a disinfectant soap or using an alcohol gel.

**Biosecurity policies**

Infection control methods can be improved by the introduction of a biosecurity policy, which should include hand hygiene, cleaning/disinfection and training/monitoring protocols, as well as how to identify at-risk patients and steps to take to reduce infection.

O’Dwyer (2013) suggested a tiered system for classifying patients based on their susceptibility to infection, level of disease present and clinical status. Similar to classifying and organising a surgical list by contamination level, most susceptible/least infectious patients should be dealt with prior to infectious patients. This classification is made up of four tiers.

**Tier one**

Patients with a poor immune status and, therefore, a high risk of infection, such as the immunocompromised, critically ill, long-term hospitalised, unvaccinated or neonatal. These patients should be housed in the main hospitalisation area or intensive care areas, depending on the level of care required (O’Dwyer, 2013).

**Tier two**

Generally well patients with no history of infectious disease, such as those admitted for elective surgery or workup of non-infectious disease. These patients should be dealt with after tier one patients (O’Dwyer, 2013).

**Tier three**

Patients with infectious diseases mildly contagious to other patients, such as those with multidrug-resistant bacterial infection – excluding meticillin-resistant *Staphylococcus aureus*; (MRSA) – open draining wounds, long-term antibiotic therapy and FIV, FIP, FeLV, ringworm, *Campylobacter*, *Giardia*, leptospirosis and pyoderma. These patients can be housed in the general hospital area, provided barrier nursing protocols are followed. MRSA patients, however, must be hospitalised in the isolation unit (O’Dwyer, 2013).

**Tier four**

Patients with highly contagious diseases, such as canine infectious enteritis (parvovirus), distemper (adenovirus), feline infectious enteritis (coronavirus), kennel cough (Bordetella bronchiseptica), cat flu (calicivirus, chlamydia and herpesvirus), infectious hepatitis and bacterial enteritis (Salmonella).
These patents must be hospitalised in the isolation unit. They must not be taken through the main hospitalisation area and any consulting or treatment areas they have contaminated must not be used until thoroughly disinfected. These patients must be housed in isolation until they are discharged (O'Dwyer, 2013).

**Conclusion**

Infection control is a key area of practice and commonly the responsibility of VNs. By maintaining standards of cleanliness and practising good hand hygiene, a large amount of infections in practice can be effectively controlled.

Effective barrier nursing protocols are necessary to prevent the spread of highly contagious disease, while the addition of a biosecurity policy provides the means to classify patients based on their susceptibility to disease and infection present, helping care to be given accordingly.

**Contamination control: part 1 – preventing surgical site infections**

**References**