Topic Overview

Providing proper nursing care for infectious patients can be challenging and time-consuming. The nursing challenges that accompany caring for these patients involve safety preparation, communication, and cleaning. Nursing considerations in addition to administering medical treatments can include minimizing patient stress (e.g., providing toys, comforting smells, calming music, sleep opportunities, cleanliness). The personal touch of caring human contact can also provide comfort to patients in isolation.

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INFECTIOUS DISEASE

Nursing in Isolation: Caring for Infectious Patients

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A fully staffed veterinary hospital enables the healthcare team to work together to administer treatment and provide nursing care for patients with infectious diseases, but an isolation ward can be a lonely place for patients and staff alike. Even in appropriately staffed hospitals, a single veterinary nurse/technician is often solely responsible for most isolation patients. Nursing patients with infectious diseases is a balancing act between the patients' needs and the needs of the rest of the hospital, which can be stressful for the patients and veterinary staff.

Animals are housed in an isolation ward when they have an infectious disease, which is a disease caused by microorganisms that spread from person to person or animal to animal.[1] A zoonotic disease is an infectious disease that spreads from animals to humans or, less commonly, humans to animals. Zoonotic diseases pose a risk for everyone working with animals. The CDC reports that more than 6 out of every 10 known infectious diseases can be zoonotic.[2]

EPIDEMIOLOGY OF INFECTIOUS DISEASE

Eco-Epidemiology Triad

An eco-epidemiology triad is a model that has been used to explain how and why infectious disease agents infect hosts and consists of a triangle in which the 3 points are the external agent (the infectious microorganism), a susceptible host, and the environment that brings them together (**FIGURE 1**).[3,4] In this model, the environment brings the host and the external agent together. It is a case of right place, right time, and right host.

In a more recent model, the 3 points of the triangle are a microbial amplification system, a microbial transmission system, and a host–microbe

Learning Objectives

- The spread of infectious disease can be minimized by housing patients in isolation wards and wearing personal protective equipment.
- Caring for patients in the isolation ward involves ensuring safety, proper preparation, effective communication, and proper cleaning.
- In addition to intensive medical care, veterinary nurses/technicians can offer patients comfort by means of toys, familiar smells, calming music, sleep opportunities, and cleanliness.

interaction system (**FIGURE 2**).[3] The basis of the amplification portion of this triad is that all creatures, including microorganisms, must reproduce to survive. Most infectious microorganisms amplify in the bodies of their host or in the body of a vector.[3] Unlike the earlier, more simplistic model, the more recent model delves deeper into the interaction between the 3 points of the triangle. After the pathogen has amplified, it must find a way to infect a new host (the basis for the microbial transmission system). Host–microbe interaction refers to how the microorganism affects the host's body. The pathogen reproduces and spreads throughout the body, which reacts by raising an immune response, resulting in an inflammatory reaction that causes signs and symptoms of the disease. As the pathogen reproduces in the host, it may be shed into the environment, continuing the cycle.[3]

Routes of Transmission

Pathogens are transmitted from a source to a new host through a variety of pathways. The routes of transmission are direct contact, aerosol, oral, fomite, and vector.[5] Different routes of transmission mean different nursing needs of affected patients. Veterinary nurses/technicians should be familiar with the routes of transmission to be able to properly care for infectious patients and protect other patients and themselves (**TABLE 1**).

Direct Contact

The most common route of transmission for infectious disease agents (pathogens) is direct contact between infected tissues or fluids and a new host. The pathogen can enter the host through mucous membranes or broken skin; thus, bites and scratches from infected animals are a risk for veterinary staff.[5]

Aerosol

Aerosol (airborne) transmission refers to the transfer of pathogens through inhalation of small particles or droplets. The particles can be inhaled or land on environmental surfaces, where they may remain until they are removed through disinfection or inhalation by a new host.[7] Particles smaller than 5 micrometers can remain suspended and travel via air currents[6]; thus, proper air flow and ventilation in an isolation ward are crucial.

Fomite

A fomite is an inanimate object contaminated by a pathogen that then comes into contact with a host. Fomites can take many forms (e.g., blankets, toys, bowls, cages, medical equipment).

Oral

Oral transmission occurs when an animal ingests a pathogen in infected food, water, and excrement or from an infected fomite.

Vector

A vector is a living creature that carries a pathogen and can transfer it to other animals. Common vectors are mosquitoes, fleas, and rodents. The vector may or may not be affected by the pathogen.

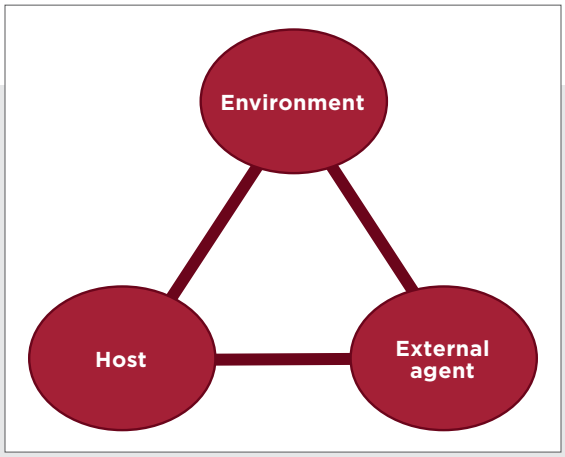

FIGURE 1. The original epidemiology triad.

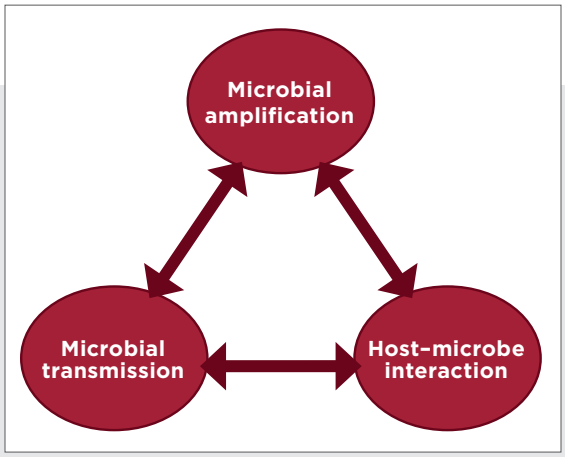

FIGURE 2. The updated epidemiology triad.

TABLE 1 Routes of Transmission and Examples of Pathogens That Are Commonly Spread via That Route

ROUTE	PATHOGEN
Direct contact	Rabies virus, feline immunodeficiency virus, *Leptospira* bacteria
Aerosol	*Bordetella bronchiseptica* bacteria, canine distemper virus, and feline influenza viruses (calicivirus, herpesvirus)[5]
Fomite	Parvovirus, methicillin-resistant *Staphylococcus aureus* bacteria
Oral	Parvovirus; *Salmonella*, *Escherichia coli,* and *Leptospira* bacteria[5]
Vector	*Borrelia burgdorferi* (agent of Lyme disease) and *Yersinia pestis* (agent of plague) bacteria[6]

ISOLATION BEST PRACTICES

Because of the infectious status of patients in an isolation ward, preventing interaction between these patients and the general patient population of the clinic is essential. The first step is housing infectious patients in an isolation ward, away from other patients. A patient arriving at the hospital with a suspected infectious disease should be immediately taken to the isolation ward by a staff member in appropriate personal protective equipment (PPE). Other steps are ensuring safety for all patients and staff, having a plan before entering and leaving the isolation ward, and adequately cleaning and disinfecting the isolation ward.

Safety

When working with animals in an isolation ward, veterinary staff must protect not only the patients in the ward but also the other patients in the hospital as well as themselves and other staff members if dealing with diseases of zoonotic potential. Even if the patient does not have a zoonotic disease, any interaction between an infectious patient and staff can result in pathogen spread to other patients in the hospital.

The key to protection is minimizing contact between staff and infectious animals. Generally, in addition to the veterinarian who will oversee the case, a veterinary nurse/technician is assigned to administer treatments and care for the patients in the isolation ward, which can be difficult and time-consuming, particularly if the veterinary nurse/technician has other patients to care for.

Protection starts with PPE. Although PPE use can seem excessive and time-consuming, it is extremely valuable for preventing the spread of infection. Taking care to ensure that PPE is worn appropriately and changed, when necessary, will protect patients and staff. Effective PPE use requires staff compliance and education; that is, proper protocols and training for every staff member, regardless of their role. The appropriate sequence for donning and doffing PPE can be found elsewhere.[8]

When treating patients in the isolation ward, the PPE that should always be worn consists of a disposable long-sleeved isolation gown or coveralls, booties, and gloves. If the mode of transmission requires it (e.g., aerosolized pathogens), a mask, hair covering, and eye covering may also be needed (**FIGURE 3**).[2,5,9]

If multiple animals are housed in the isolation ward, PPE must be fully changed between every patient to

FIGURE 3. A veterinary nurse/technician wearing personal protective equipment (a disposable isolation coverall, gloves, and cap).

prevent pathogen spread. PPE should never be reused, even for the same patient. PPE should be thrown in dedicated isolation ward garbage and disposed of appropriately, which limits the risk of microorganisms getting on clothing or skin and spreading through the hospital. Trash containers should be metal or thick plastic with tight-fitting lids.[5] In addition, appropriate hand hygiene minimizes the risk for transmission.

Preparation

Before stepping into the isolation ward, the veterinary nurse/technician should be prepared and have a plan to minimize the stress of providing intense nursing care to isolation patients. This plan is usually based on the hospital's protocol for dealing with infectious patients to effectively manage them and minimize pathogen spread within the hospital. All staff should be aware of their hospital's protocol and their role in preventing transmission and caring for infectious patients.[5,9,10]

Before entering the isolation ward to begin treatments, check the patient's treatment sheet. Confirm that you have all the necessary supplies that will be needed to complete treatments. Check with the veterinary nurse/technician or doctor who was last in the isolation ward and find out if there is anything that needs to be replenished (e.g., paper towels, urinary pads, catheters, syringes). Equipment that enters the isolation ward should be marked for use in the isolation ward only.[5]

When leaving the isolation ward, make a list of things that will need to be replaced the next time someone enters the ward; however, do not take the list with you because nothing should be removed, including paper, from the isolation ward. Instead, the list can be taped to the window so it can be seen from outside the ward or written on isolation ward windows with dry-erase markers. If possible, gather the items and leave them outside the ward while the list is fresh in your mind.

Cleaning

Appropriate cleaning and disinfecting of the isolation ward limits the spread of pathogens from patient to patient but also prevents reinfection of the same patient. Describing the types of cleaners and disinfectants is beyond the scope of this article; however, hospital protocols for infectious disease control should outline the types of cleaner/disinfectant to be used for each type of infectious microorganism as well as the way the product is to be used (i.e., the concentration and required contact time needed to be effective).[5,10] Staff members who will be working with infectious patients should be taught how to appropriately use and safely handle cleaning products. Resources are available that describe the cleaner/disinfectant to use to eliminate specific pathogens.[5,11]

Communication

Communicate with other staff members before entering the ward so they know where you are and that you may need assistance. Check with the veterinarian in charge of the patients to see if any patients need something not yet on the treatment sheet. If the veterinarian has spoken with the clients since treatments were last administered, they may ask the veterinary nurse/technician to check on the animal's state or run additional diagnostics that they discussed with the clients. It may be helpful to suggest to the clinician that grouping treatments as much as possible will minimize the amount of time spent in the isolation ward.

If help is needed while in the ward, have a way to contact a support staff member or the veterinarian. Phones are not ideal for an isolation ward because they can act as fomites. Walkie-talkies can be used because they can more easily be disinfected or covered with a plastic bag that can be disposed of and replaced. Most isolation wards have a window out to the main area of the hospital, which is mainly used to keep an eye on the patients when no one is physically in the room, but the veterinary nurse/technician can also use it to signal for assistance (**FIGURE 4**).

Always follow up with the veterinarian after tending to the patient(s) to update them on patient progress. As the persons who spend the most time with the patient, veterinary nurses/technicians may be asked to give nursing updates to clients. When speaking with clients, be sure to relay how their pet is doing in the hospital and share all the special things you are doing for them. Many clients will ask how long you think the pet will be hospitalized or what the prognosis is; however, do not provide a prognosis or medical details unless specifically instructed by the veterinarian.

NURSING CONSIDERATIONS

Patient Treatments

Patients housed in isolation are likely to need multiple, possibly involved, treatments. Be ready to spend some

time with each patient. Focus on a single patient at a time. After treatments for a patient are complete, clean and disinfect all shared surfaces, remove PPE, wash hands, and change into clean PPE before moving to the next patient. Part of a nursing plan for patients in an isolation ward should include nursing care in addition to therapeutic treatments. Providing enrichment, comfort, and cleanliness is an extremely valuable part of nursing infectious patients.

Stress Reduction

Hospitalized patients are often stressed, and patients in an isolation ward are no exception. They may experience more loneliness and stress than hospitalized patients in the general population for several reasons. First, they are often alone most of the time. Although having a veterinary nurse/technician who interacts with patients in the isolation ward only is ideal, the reality is that few hospitals have enough staff to dedicate a single person to working in isolation. Second, patients are housed in a ward where efficiency, cleanliness, and medical care are necessarily prioritized over excessively providing patient comfort. Last, patients' normal routines have been interrupted and they have nothing familiar to help comfort them.

Patients exhibit stress behaviors in different ways. Dogs may chew on the cage bars, whine, howl, or retreat to the corner of the cage. Cats may be skittish and press their faces into the corner of the cage, lay their ears against their head, hiss, or become fractious. Stress-reducing techniques include providing toys, familiar smells, calming music, opportunities for sleep, and cleanliness.

FIGURE 4. Window looking into an isolation ward.

Toys

Providing enrichment in the form of toys that can be disposed of after use can help decrease stress and alleviate boredom. Cats' anxiety can also be mitigated by providing places for them to hide, such as boxes that can be disposed of when the patient is discharged (**FIGURE 5**).[12,13]

Smells

Anxiety can also be provoked by the smells of a hospital and an isolation ward, where strong cleaners may be used.[12] Sources of stress may be mitigated by the use of pheromone sprays or diffusers or having clients bring in a towel or clothing that smells like the patient's home.[13] Note, however, that items from home should not be favorites or irreplaceable as they may act as fomites and further transmit pathogens back to the home.

Music

Several studies have shown that classical music may benefit hospitalized patients.[14,15] In a 2015 study, Bowman et al found a significant reduction in the cortisol levels in saliva of animals in kennels that were exposed to classical music for 6.5 hours a day versus

FIGURE 5. A cat sheltering in a cardboard box in an isolation cage.

those that were not.[16] Playing calming music quietly in the isolation ward seems reasonable if the hospital has the capability to do so.[17] A 2016 study found that playing audiobooks in lieu of music also has a calming effect on animals in kennels.[18]

Sleep

Sleep helps promote healing, and sleep loss has been acknowledged as the main reason for human patient stress in intensive care settings.[13,19] Although interruptions to a patient's sleep schedule are unavoidable in a hospital environment, every effort should be made to encourage sleep and provide an environment that promotes rest (e.g., dimming lights, reducing noise). Grouping treatments to minimize disruptions gives the patient opportunities for uninterrupted sleep.

Cleanliness

Sick animals may not feel well enough to clean themselves; making sure they are kept clean and dry can increase their comfort level and reduce stress. For patients healthy enough to tolerate it, consider bathing to remove urine or feces (**FIGURE 6**). When bathing is not an option, a damp towel can be used to clean their fur. To prevent urine scald or irritation, special attention should be given to the skin. Soiled bedding should be changed as soon as it is noticed. Using absorbent disposable pads makes cleanup easier. As with other disposable items in the isolation ward, such pads should be thrown in the ward garbage and disposed of appropriately to prevent disease spread.

FIGURE 6. A cat being bathed in an isolation ward.

Taking infectious dogs outside to urinate or defecate is not recommended as the chance of spreading disease is too high.[20] Thus, be sure that patient bedding, the cage, and the patient are fully cleaned and that all bodily waste is disposed of appropriately.

Kirby's Rule of 20 includes providing tender loving care.[21] When administering treatments to patients in isolation, taking time to clean and cuddle patients and to provide human interaction and consolation can make their time in the hospital less stressful.

SUMMARY

Isolation nursing can seem overwhelming at times. It may feel lonely and like you are the only person caring for these patients. The number of steps involved in isolation nursing—donning and doffing PPE, cleaning and disinfecting, properly disposing of waste, and administering needed treatments—can be stressful. It may be tempting to take shortcuts, but remember that this level of care is not done just because of hospital protocols but because the veterinary team wants to provide the best care possible for patients. Being accountable to patients and clients, in addition to team members, is rewarding when patients are given the best medical care as well as much-needed tender loving care to help them heal. TVN

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1. **Which of the following is a living organism that transfers pathogens from one animal to another?**
   a. Fomite
   b. Vector
   c. Fungus
   d. Droplet

2. **Which of the following is considered optional personal protective equipment (PPE) and needs to be worn only if the disease warrants it?**
   a. Gown
   b. Booties
   c. Mask
   d. Gloves

3. **You are the veterinary nurse/technician assigned to the isolation ward today. When should you check in with the doctor about the isolation patients?**
   a. Before going into isolation
   b. After leaving isolation
   c. When the doctor asks to speak with you
   d. A and B

4. **When there are multiple patients in the isolation ward you must do this between patient treatments.**
   a. Wash hands
   b. Fully change PPE
   c. Disinfect shared surfaces
   d. All of the above

5. **All of the following are nursing considerations for maximizing patient comfort and minimizing anxiety except:**
   a. Promoting sleep
   b. Wearing PPE
   c. Bathing
   d. Playing quiet music