



Infection Prevention and Control Best Practices

For Small Animal Veterinary Clinics

Dear veterinary staff member,

We are conducting a brief online survey to understand your current infection control practices and your motivation for seeking out these guidelines. Participation in the survey is strictly voluntary. You may exit the survey at any time, and you may skip any questions you wish. All responses are anonymous

This survey should only take approximately 2-3 minutes to complete. We would greatly appreciate your feedback.

Click this link to start the survey:

https://uoguelph.eu.qualtrics.com/jfe/form/SV_6DbIPOk3dZnLbQ9

Personal Protective Equipment (PPE)

Personal protective equipment (PPE), including dedicated hospital attire, is an important routine infection control tool. Use of PPE reduces the risk of contamination of personal clothing, exposure of skin and mucous membranes of clinic personnel to pathogens, and transmission of pathogens between patients by staff. Use of PPE does not eliminate the need for appropriate environmental controls, such as hazard removal and separation of patient areas from staff rooms (see [Chapter: Basic Principles of Infection Prevention and Control](#)).

Some form of PPE must be worn in all clinical situations, including any contact with animals or their environment. [Tables 1 and 2](#) summarize recommended PPE for routine veterinary procedures, and infectious disease control precautions by disease condition and agent, respectively. These recommendations must always be tempered by professional judgment, while bearing in mind the basic principles of infectious disease control, as every situation is unique in terms of the specific clinic, animal, personnel, procedures and suspected infectious disease.

Use of PPE does not eliminate the need for appropriate environmental controls, such as hazard removal and separation of patient areas from staff rooms.

Personal protective outerwear

Personal protective outerwear is used to reduce the risk of pathogen transmission by clothing to patients, owners, other personnel and the public. It also allows for easy removal of the outer layer of clothing should it become contaminated. Street clothes should be covered by protective outerwear of some kind, such as a lab coat, whenever there may be contact with an animal or when working in a clinical environment (including cleaning). Personal protective outerwear, including lab coats, scrubs and other dedicated hospital attire, should not be worn outside of the work environment, in order to prevent transmission of pathogens between the clinic and household / public places. These items should not be taken home by personnel to be laundered, rather they should be washed on-site, along with other clinic laundry.

Lab coats

Lab coats are meant to protect clothing from contamination, but generally they are not fluid resistant, so they should not be used in situations where splashing or soaking with potentially infectious liquids is anticipated. Lab coats worn during patient handling should be removed prior to performing clean tasks, such as eating and reprocessing equipment. They should be changed promptly whenever they become visibly soiled or contaminated with body fluids, and at the end of each day. When handling patients with potentially infectious diseases, lab coats should be laundered after each use, because it is almost impossible to remove, store/hang and reuse a contaminated lab coat without contaminating hands, clothing or the environment.

Scrubs

Short-sleeved scrub tops and scrub pants are often worn in veterinary clinics as a form of basic personal protective outerwear. They have the advantage of being durable and easy to clean, and their use prevents contamination and soiling of street clothes worn by personnel outside the clinic. Like lab coats, they are not fluid resistant, and they should be changed promptly whenever they become visibly soiled or contaminated with body fluids, and at the end of each day.

Designated scrubs should always be worn during surgery — these scrubs should not be worn during other procedures or when handling patients outside of surgery. Scrubs worn for surgery should be covered with a lab coat outside of the surgical area.

Street clothes should be covered by protective outerwear of some kind, such as a lab coat, whenever there may be contact with an animal or when working in a clinical environment. Personal protective outerwear, including lab coats, scrubs and other dedicated hospital attire, should not be worn outside of the work environment.



Non-sterile gowns

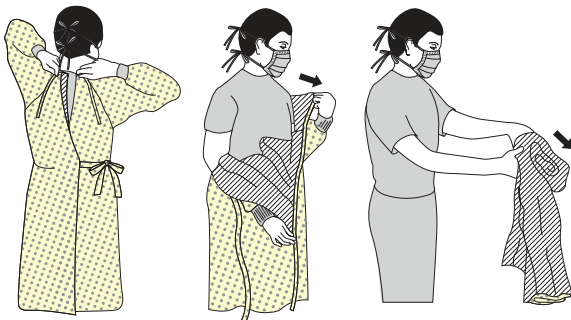
Gowns provide more coverage for barrier protection than lab coats, and are typically used for handling animals with suspected or confirmed infectious diseases, including those housed in isolation. Gowns should cover the torso and arms, and fit snugly at the wrist. Permeable gowns can be used for general care of patients in isolation. Use impermeable (i.e. waterproof) gowns to provide greater protection when splashes or large quantities of body fluids are present or anticipated. Do not reuse disposable gowns. Launder reusable fabric gowns after each use, because hanging/storing and reusing contaminated gowns inevitably leads to contamination of hands, clothing or the environment. Wear gloves whenever gowns are worn. Gowns (and gloves) should be removed and placed in the trash or laundry bin before leaving the animal's environment, and hand hygiene should be performed immediately after.

It is important to train personnel on how to remove (doff) gowns properly, in such a way as to avoid contaminating themselves and the environment. The outer (contaminated) surface of a gown should only be touched with gloves.

Procedure for doffing of personal protective equipment (modified from PHO 2012, CDC 2016):

1. **Disposable gown:** With gloves still on, grasp the front of the gown and pull it away from the body, breaking the ties, and fold or roll the gown inside-out into a bundle as it is removed. As the sleeves are removed, also peel off gloves leaving them inside the bundle. Only touch the inside of the gloves and gown with bare hands. Place the bundle directly in a waste container.
2. **Reusable gown:** Remove gloves first. Unfasten or break ties behind the neck. Peel the gown down from the shoulders and arms, only touching the neck ties and inside surfaces of the gown with bare hands. Fold or roll the gown inside-out into a bundle as it is removed. Place the bundle directly in a waste container or laundry bin.
3. Perform hand hygiene.
4. Remove eye protection (if applicable).
5. Remove mask (if applicable).
6. Perform hand hygiene.
7. If body fluids soaked through the gown, promptly remove the contaminated underlying clothing and wash the skin.

FIGURE 1. How to remove a gown



Launder reusable fabric gowns after each use, because hanging/storing and reusing contaminated gowns inevitably leads to contamination of hands, clothing or the environment.

<https://www.cdc.gov/hai/pdfs/ppe/PPE-Sequence.pdf>

Additional personal protective equipment

Gloves

Gloves reduce the risk of pathogen transmission by providing a protective barrier to bare hands. They should be worn when contact with blood, body fluids, secretions, excretions and mucous membranes is anticipated. Gloves should also be worn when cleaning cages and environmental surfaces, and when handling dirty laundry (especially if gross contamination of items is present) Gloves are NOT a substitute for proper hand hygiene. It is a common misconception that using disposable gloves negates the need for hand hygiene. Gloves do not provide complete protection against hand contamination, therefore hand hygiene immediately after removing gloves is essential ([Korniewicz 2004](#)).

Proper glove use includes the following:

- Remove gloves promptly after use, avoiding contact between skin and the outer glove surface.
- Do not touch surfaces with gloved hands that will be touched by people with non-gloved hands.
- Take care to avoid touching and contaminating personal items such as telephones, pens and pagers.
- Do not touch one's face or glasses with gloved hands.
- Wash hands or use an alcohol-based hand sanitizer immediately after glove removal.
- Do not wash or reuse disposable gloves.

Gloves are NOT a substitute for proper hand hygiene

Change gloves and perform hand hygiene when:

- Moving from contaminated areas to clean areas on the same animal.
- Moving from dirty to clean procedures on the same animal.
- After contact with large amounts of blood and/or body fluids.
- Between individual animals.

Gloves come in a variety of materials. The choice of glove material depends on their intended use. Latex gloves are commonly used, but if latex allergies are a concern, acceptable alternatives include nitrile or vinyl. Latex gloves will decompose and lose their integrity when exposed to many chemicals. If exposure to chemicals such as disinfectants is expected (e.g. when cleaning and disinfecting cages), disposable nitrile gloves or heavier, reusable rubber gloves (e.g. common dishwashing gloves) can be used. Reusable gloves must be disinfected at the end of each task. It is also important to provide a suitable variety of glove sizes to accommodate all staff who are expected to use them, so that they fit properly (not too big or too small).

Face protection

Face protection prevents exposure of the mucous membranes of the eyes, nose and mouth to infectious materials. Face protection typically includes a nose-and-mouth mask (e.g. surgical mask) and goggles, or a full face shield. Face protection should be used whenever exposure to splashes or sprays is likely to occur, including dental procedures, nebulization, and wound lavage. Masks with a flexible nose piece that can be adjusted to the individual user should be used so that the mask fits snugly around the nose and mouth.

Respiratory protection

Respiratory protection is designed to protect the respiratory tract from infectious pathogens transmitted through the air.

The need for this type of protection is limited in veterinary medicine because there are few relevant airborne or aerosol zoonotic pathogens in companion animals (e.g. influenza virus, plague (*Yersinia pestis*)), in most regions. The N95-rated disposable particulate respirator is a type of mask that is inexpensive, readily available, easy to use, and provides adequate respiratory protection in most situations. However, individuals need to be fit-tested to ensure proper placement and fitting of an N95 respirator. Special N95 respirators are required for individuals with beards. Surgical masks are not a substitute for N95 respirators.

Footwear

Closed toed, cleanable footwear must be worn at all times in the clinic to reduce the risk of injury from dropped equipment (e.g. scalpels, needles), scratches from being stepped on by dogs, and to protect the feet from contact with potentially infectious substances (e.g. feces, discharges and other body fluids). Footwear should have adequate tread to minimize the potential for slips, trips, and falls.

Designated footwear or disposable shoe covers are required in areas where infectious materials are expected to be present on the floor, in order to prevent their spread to other areas. This is particularly important in veterinary clinics because patients, and sometimes the personnel working with them, have very close contact with the floor. Designated footwear or disposable shoe covers may be required when handling patients with infectious diseases that are kept on the floor (e.g. in a large dog run) or that may contaminate the floor around their kennel (e.g. an animal with severe diarrhea). Such footwear must be removed as the person leaves the contaminated area, and should be immediately disposed of in the garbage (if disposable), or left at the entrance of the contaminated area on the “dirty” side.

TABLE 1. Recommended personal protective equipment for routine veterinary procedures, in addition to standard personal protective outwear (e.g. lab coat or scrubs) worn at all times in clinical areas.

Procedure	Disposal Gloves	Sterile Gloves	Gown / Dedicated Lab Coat	Face Protection ^a	Other/Comment
Bandage change (routine)	+				
Bandage change (infectious)	+		+	(+)	
Crushing pills					Mask only ^b
Dental procedures	+		+	+	
Digital rectal palpation	+				
Draining sterile seroma/hematoma		+			
Expressing anal glands	+				
Fine needle aspirate	+				
Handling soiled laundry	+		+		
Handling stool samples	+				
Handling urine samples	+ ^c				
Injections: intramuscular and subcutaneous					
Intranasal or oral <i>Bordetella</i> vaccination	+				
Intravenous catheter placement (long term)		+			Central lines and arterial catheters
Intravenous catheter placement (short term)	+				
Lancing abscess	+		+	(+)	
Obstetrical procedures: cats	+		+	+	Q fever risk
Obstetrical procedures: dogs	+				
Oral antimicrobial administration	+ ^b				
Oral examination (detailed)	+				
Urinary catheter placement		+			
Venipuncture					
Wound cleaning/debridement (dirty)	+				
Wound cleaning/debridement (clean)		+			
Wound lavage/flushing	+		+	(+)	
Wound suturing		+			

+ PPE recommended; (+) PPE recommended if splash risk is present. ^a Face shield or protective glasses and face mask; ^b Indicated in individuals with sensitivity to the drug; c/lf leptospirosis is suspected, glove use is strongly recommended, but consider in cases of other urinary tract infections as well

TABLE 2. Infectious disease control precautions by disease condition and agent

Disease Condition	Agent Name	Disease Name	Zoonotic Risk	Bite/Scratch Concern	Environmental Contamination	Arthropod Vector	PPE Protocol			
							Gloves	Gown ^a	Mask ^b	Other
Respiratory Tract Infection	<i>Bordetella bronchiseptica</i>	Bordetellosis	(+)		+		+	+		
	Canine influenza virus	Influenza	(+)		+		+	+		
	Feline calicivirus	Calicivirus			+		+	+		
	Feline herpesvirus 1	FVR			+		+	+		
	<i>Francisella tularensis</i>	Tularemia	+	+	+	+	+	+	+	C
	<i>Pasteurella multocida</i>	Pasteurellosis	+	+						P
	<i>Mycobacterium bovis</i> , <i>Mycobacterium tuberculosis</i>	Tuberculous mycobacteria	+		+		+	+	+	
	Canine parainfluenza virus	Parainfluenza			+		+	+		
Diarrhea	<i>Campylobacter jejuni</i>	Campylobacteriosis	+		+		+	+		F, S
	<i>Clostridium difficile</i>	<i>C. difficile</i> infection	+		+		+	+		F, S
	<i>Cryptosporidium spp.</i>	Cryptosporidiosis	+		+		+	+		F, S
	<i>Giardia spp.</i>	Giardiasis	+		+		+	+		F, S
	<i>Salmonella spp.</i>	Salmonellosis	+		+		+	+		F, S
	<i>Toxoplasma gondii</i>	Toxoplasmosis	+		+		+	+		F, S
	Canine parvovirus	Parvo			+		+	+		F, S
	Feline panleukopenia virus	Panleukopenia			+		+	+		F, S
Neurological Signs	<i>Listeria monocytogenes</i>	Listeriosis	+		+		+	+	+	C
	Canine distemper virus	Distemper			+		+	+		
	Rabies virus	Rabies	+	+			+	+	+	C
Skin Condition External Parasites	MRSA	MRSA pyoderma	+	+	+		+	+		F, C
	MRSP	MRSP pyoderma	(+)		?		+	+		F, C
	Fleas	Fleas	+		+		+	+		
	Lice	Pediculosis			+		+	+		
	Mites	Mange	+		+		+	+		
	Ticks	Ticks	+		+		+			L
	<i>Microsporum spp.</i> <i>Trichophyton spp.</i>	Dermatophytosis, Ringworm	+		+		+	+		
	<i>Sporothrix schenckii</i>	Sporotrichosis	+	+			+			F, S, L
Wounds and Abscesses	MRSA	MRSA	+	+	+		+	+		F, C
	MRSP	MRSP	(+)		?		+	+		F, C
	<i>Pasteurella multocida</i>	Pasteurellosis	+	+						P
	VRE	VRE	+		+		+	+		C, S
	Other MDR bacteria	Other MDR bacteria	+				+	+		C
Fever of Unknown Origin / Non-Specific Clinical Signs	<i>Bartonella spp.</i>	Cat Scratch Disease	+	+		+				B
	<i>Borrelia burgdorferi</i>	Lyme Disease				+				B
	<i>Brucella canis</i>	Brucellosis	+				+	+	+	
	<i>Chlamydophila psittaci</i>	Psittacosis	+		+		+	+	+	C

TABLE 2. Continued. Infectious disease control precautions by disease condition and agent

Disease Condition	Agent Name	Disease Name	Zoonotic Risk	Bite/Scratch Concern	Environmental Contamination	Arthropod Vector	PPE Protocol			
							Gloves	Gown ^a	Mask ^b	Other
Fever of Unknown Origin / Non-Specific Clinical Signs ... continued	<i>Coxiella burnetii</i>	Q fever	+		+		+	+	+	C
	<i>Francisella tularensis</i>	Tularemia	+			+	+	+	+	C
	<i>Leishmania spp.</i>	Leishmaniasis	+			+				B
	<i>Leptospira spp.</i>	Leptospirosis	+		+		+	+		C, S
	<i>Rickettsia rickettsii</i>	RMSF				+				B
	<i>Toxoplasma gondii</i>	Toxoplasmosis	+		+					F
	Canine distemper virus	Distemper			+		+	+		F
	Canine adenovirus 2	Adenovirus			+		+	+		
	Feline leukemia virus	Feline leukemia			+		+	+		
	FIV	FIV			+ ^c					
	Rabies virus	Rabies	+	+			+	+	+	C
	<i>Yersinia pestis</i>	Plague	+	+		+	+	+	+	B, C
Intestinal Worms	<i>Ancylostoma spp.</i>	Hookworm	+		+					F
	<i>Dipylidium caninum</i>	Tapeworm	+			+ ^d				P
	<i>Echinococcus spp.</i>	Hydatid disease	+		+		+	+		F, S
	<i>Taenia spp.</i>	Tapeworm			+					F
	<i>Toxocara spp.</i>	Roundworm	+		+					F

+ Risk exists/PPE required; (+) moderate risk; ? Unknown risk

FIV – feline immunodeficiency virus; **FVR** – feline viral *rhinotracheitis*; **MDR** – multidrug-resistant; **MRSA** – methicillin-resistant *Staphylococcus aureus*; **MRSP** – methicillin-resistant *Staphylococcus pseudintermedius*; **PPE** – personal protective equipment; **RMSF** – rocky mountain spotted fever; **VRE** – vancomycin-resistant *Enterococcus spp.*

^a Disposable gown or dedicated lab coat; ^b Mask covering the nose and mouth (e.g. surgical mask) and goggles, or full face shield; ^c Environmental contamination by blood; ^d Transmission by ingestion of fleas

B = Prevent direct contact with blood; **C** = Cover broken skin; **F** = Prevent direct contact with feces and transfer of fecal contamination; **L** = Lab coat (non-dedicated) recommended; **P** = Standard PPE only, according to procedure; **S** = Shoe covers recommended if there is possible fecal contamination (or urine contamination for leptospirosis) of the floor in the area where the animal is being kept

Reportable diseases in animals in Canada included in this table:

Notifiable diseases in humans in Canada included in this table:

Brucellosis
Rabies

Brucellosis
Campylobacteriosis
Clostridium difficile infection
Cryptosporidiosis

Giardiasis
Listeriosis
Lyme Disease
Plague

Psittacosis
Rabies
Salmonellosis
Tularemia

See Chapter: Reportable Diseases and Appendix: Management of Rabies Suspects for more information.

References

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