



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

Additional Considerations

Safety of Clinic Personnel

Good infection prevention and control strategies in all areas of the veterinary clinic will enhance the safety of clinic personnel. This includes, but is not limited to, maintaining good hand hygiene, using appropriate personal protective equipment (PPE), cleaning and disinfection methods, and following appropriate procedures for patient management and care. Details of these practices can be found throughout this document. This section highlights some other important considerations for maintaining the safety of clinic personnel as they relate to infection prevention and control. Employers and hospital managers should be aware of additional occupational health risks, and abide by workplace safety regulations in their region.

Bites and scratches

Bites and scratches are an inherent risk in veterinary medicine and a common cause of occupational injury and illness. From January 2007 to June 2011, injury from animal contact accounted for 82% of workers' compensation claims submitted to the American Veterinary Medical Association Professional Liability Insurance Trust ([JAVMA News 2012](#)). In a survey of US veterinarians, approximately two-thirds had sustained a major animal-related injury at some time, and bites and scratches accounted for just over one-third of these injuries ([LanderCASPER 1988](#)). Approximately 3% to 18% of dog bites and 28% to 80% of cat bites become infected ([Davies 2000](#)). Most dog and cat bite wound infections are caused by a mixture of aerobic and anaerobic bacteria ([Talan 1999](#)). It should be assumed that all animals are carrying potentially zoonotic pathogens in their mouths.

In general, veterinary personnel should be able to recognize behaviours indicative of fear, anxiety or stress in animals, and situations that are associated with an increased tendency for an animal to bite. Bite prevention practices must be guided by professional judgment and use of accepted methods to reduce fear, anxiety and stress in patients. Personnel should take all necessary precautions to prevent animal-related injuries in the clinic. These may include physical restraint or chemical restraint (sedation or anesthesia) of an animal. Techniques for reducing potential injurious behavior should be use whenever possible (fearfreepets.com), but appropriate equipment (e.g. different sizes of muzzles, bite-resistant gloves, catch pole, cat bags) should be readily available if necessary. Such equipment should also be as easy to clean as possible. Experienced veterinary personnel rather than owners should restrain animals for procedures whenever possible. Personnel must always be aware of changes in their patients' behaviour which may precede attempts to bite. Veterinary personnel should not let client perceptions or attitudes prevent them from using appropriate bite-prevention measures (e.g. muzzling). Notes should be made in the files of patients that routinely exhibit fearful or aggressive behaviour to alert staff.

If anyone is bitten by an animal:

- Immediately wash the wound thoroughly with plenty of soap and water, and remove any visible debris
- Report bite incidents to local public health (where required by law)
- Medical attention is particularly important for any bite that:
 - is on a hand or over a joint
 - is over a tendon sheath, such as bite on the wrist or the ankle
 - is on the face
 - is in the genital area
 - is over a prosthetic device or implant
 - is over an area with pre-existing chronic swelling (edema)
 - causes a large amount of tissue damage (e.g. a deep tear or tissue flap)
 - is sustained by a person without a functional spleen
 - is sustained by a person with an immune system compromised by disease or drug therapy

Regardless of the location of the wound, if the area becomes increasingly painful or swollen, if the wound develops a discharge, or if the person develops a fever or swollen lymph nodes, consult a physician as soon as possible.

Scratches pose a lower risk of infection compared to bites, but can still cause significant tissue damage that is then susceptible to infection by endogenous or exogenous bacteria. The risk of rabies transmission from scratches is negligible, unless the wound is also contaminated with saliva from the animal. Nonetheless, as for bite wounds, scratch wounds should be washed immediately with plenty of soap and water, and any debris removed. Subsequent wound care to prevent infection depends on the nature and site of the wound. If in doubt, or if the victim has a compromised immune system for any reason (see above), it is best to seek medical attention.

A physician will decide (in some cases in consultation with public health personnel) if antimicrobial therapy, tetanus vaccination, rabies post exposure prophylaxis, or any additional treatment (e.g. lavage, debridement, sutures) are necessary for bite or scratch wounds. Most bite wounds are not sutured in order to promote drainage and reduce the risk of infection.

Emergency contact information (i.e. physician, local public health department) should be clearly posted in the clinic.

All bites or scratches should be reported to the clinic infection control practitioner (ICP) and the injury documented.

A pre-determined bite protocol that reflects applicable labour laws helps ensure that all necessary reporting and documentation occur. Bites and scratches should not be considered “part of the job” and summarily dismissed. Even seemingly small, innocuous injuries can develop severe complications. (See [Table 2 in Chapter: Personal Protective Equipment for infectious agents related to bites and scratches.](#))

Regular review of injuries (including those unrelated to infectious disease risks) is useful to identify trends in behaviour or procedures that may be associated with injuries and to develop protocols to reduce the risk of injuries. Documentation is also important for employees in the event that serious health problems subsequently develop.

Sharps

Injuries from needles and other sharp implements are common in veterinary medicine but are largely preventable. Although there is not the level of risk of bloodborne pathogen exposure in veterinary practice as there is in human medicine, serious outcomes can result following needlestick or other sharps injuries. These may include physical trauma, secondary infection and drug reactions due to live vaccines and other substances (i.e. toxic, allergic, idiosyncratic).

Proper sharps handling

Proper sharps handling practices are a practical yet effective way of reducing workplace injuries in veterinary clinics. Use appropriate barriers (e.g. closed toed shoes) and safe work practices when using sharp instruments and devices (e.g. needles, scalpels, etc.), after procedures and when cleaning used instruments.

To prevent needlestick and other sharps injuries:

- Never remove needle caps by mouth.
- Do not bend or manipulate needles in any way.
- Do not pass uncapped needles to another person.
- Ensure proper animal restraint to reduce inadvertent needlestick injuries from animal movement.
- Do not recap needles by hand. If recapping is required, use the “one-handed scoop” technique (see below), forceps or a needle cap holder.
- **Ensure that approved point-of-use sharps disposal containers are located everywhere needles are handled.** These containers are puncture-resistant, leak-proof, and prevent removal (both accidental and intentional) of discarded sharps.
- Always dispose of sharps immediately in an approved sharps disposal container. Do not overfill disposal containers.
- **Never dispose of needles or other sharps into anything other than an approved sharps container**, even if they are capped or otherwise contained. This reduces the risk of accidental injury to veterinary personnel, patients, clients and non-veterinary personnel (e.g. waste disposal personnel).
- Ensure all veterinary personnel have received training on proper sharps handling.

The most important precaution for preventing needle-stick injuries is to **avoid recapping needles**. Recapping needles causes more injuries than it prevents. When it is absolutely necessary to recap needles as part of a medical procedure or protocol:

- Use a mechanical device such as forceps or hemostats to replace the cap on the needle.
- Alternatively, the needle can be recapped using the “**one-handed scoop**” technique:
 - Place the cap on a flat horizontal surface.
 - Holding the syringe with the attached needle, or the needle hub alone (when unattached), scoop up the cap with the needle by sliding the needle tip inside, without touching the cap with one’s other hand.
 - Once the point of the needle is covered, tighten the cap by pushing it against an object, or by pulling the base of the needle cap onto the hub of the needle with the same hand holding the syringe.

After injecting live vaccines or aspirating body fluids or tissue, the used syringe should be placed in a sharps container with the needle attached. Following most other veterinary procedures, the needle and syringe may be separated for disposal of the needle in the sharps container. This is most safely accomplished by using the needle removal device on an approved sharps container, which allows the needle to drop directly into the container without being handled or touched.

As with bites, needlestick injuries should be documented and, if necessary, investigated. Requiring documentation of needlestick injuries can help detect a change in rates, allow for detection of factors that are recurrently associated with injury, and help develop a plan to reduce injuries.

Recapping needles causes more injuries than it prevents.

Sharps safety for clients

Periodically, owners may be required to treat their animals at home with injectable medications (i.e. insulin, subcutaneous fluids). In these situations, it is the responsibility of the attending veterinarian to:

- Provide (and document) training on how to handle sharps, including injection and disposal practices.
- Provide an approved sharps container or give clients clear instructions regarding how to obtain one.
- Ensure that the client is able to safely handle and dispose of sharps.
- Advise clients that the sharps container should be returned to the clinic for disposal when 3/4 full, and exchanged for a new container (if necessary).

Used sharps are considered biomedical waste in veterinary practices. Dispose of used sharps containers in accordance with regulations from municipal and/or provincial/territorial authorities.

Clinic laboratory

Activities involving the clinic lab may include fecal parasitological testing, hematological testing, urinalysis, cytological analysis of other samples, as well as more intensive procedures such as bacterial and fungal culture. Any activities involving biological specimens pose some degree of risk of exposure of personnel and contamination of the environment. The risk varies, and may range from quite low (e.g. hematology) to high (e.g. bacterial and fungal culture). When pathogens are handled, especially when they are cultivated, clinics must ensure that they are compliant with all relevant regulations regarding these activities.

Laboratory personnel

All personnel who handle specimens should be trained in specimen handling, testing and biosafety practices. The training should specifically relate to their activities, as the practices and risks associated with some (e.g. use of an automated blood analyser) can be very different from others (e.g. fungal culture). Clear guidelines for these practices, required personal protective equipment, cleaning and disinfection, waste disposal and spill response (see below) are required. Training, as always, needs to be documented.

Laboratory area

A designated area of the clinic should be used for specimen processing, even if it only involves processing samples to send to an external diagnostic laboratory. This should be separate from treatment and surgery rooms so as to decrease the risk of contamination of these areas. After processing a specimen:

- Dispose of sharps such as microscope slides and glass pipettes in approved sharps containers.
- Dispose of samples from animals with suspected or known infectious diseases as infectious waste.
 - Regulations vary by region and facilities must be compliant with legal requirements for biohazard/infectious disposal in their area.
- Clean and disinfect specimen processing areas immediately after use.
- Perform hand hygiene.

Handling of biological specimens

Urine from animals with suspected urinary tract disease, and all feces, aspirates, and swabs should be treated as potentially infectious material, even though they are not necessarily considered biomedical waste. Proper handling includes:

- Wearing **protective outerwear** (e.g. lab coat) and **disposable gloves** when handling specimens.
 - Discard gloves and wash hands immediately after handling these items.
 - Avoid touching clean items (e.g., microscopes, telephones, pens) while handling specimens or prior to performing hand hygiene.
- Carefully filling specimen containers so as to **prevent contamination of outer surfaces** with feces, blood or other materials.
 - If contamination occurs, clean and disinfect the surface with an appropriate product.
- Appropriate packaging of biological specimens that are being sent to external laboratories.
 - Store samples in **leak-proof plastic containers** designed for the specimen (e.g. blood vials, urine containers, fecal cups) and then place them in a secondary clean, sealed plastic bag prior to shipping.
 - If samples must be refrigerated, do not store them in refrigerators that also contain medications, vaccines or food (human or animal).

Spill plan

Even with good storage and handling practices, spills of biohazardous materials may occur. A written spill plan should be available that details the response to large and small spills, which should be appropriate for the substances that are handled.

In general, to respond to a spill:

1. Notify people in the area (or that are likely to enter the area during the spill cleanup process) that a spill has occurred.
2. Wear proper protective outerwear (e.g. laboratory coat, gloves).
3. Contain the spill as quickly as possible to prevent further spread, if necessary.
4. Gather all required materials (e.g. paper towels, disinfectant, biohazard bag) prior to beginning clean up.
5. Remove as much gross material as possible (including solids and liquids) using absorbent materials such as paper towels and place them directly into a biohazard bag.
 - Broken glass must be placed in a sharps disposal container or other rigid container. Do not place directly in a biohazard bag.
6. Apply a disinfectant that is appropriate for the pathogens that may be present to the contaminated area. Ensure the surfaces remain wet for the indicated contact time for the product.
7. Wipe the area and dispose of paper towels in the biohazard bag.
8. Remove protective clothing and perform hand hygiene.
9. Consider why the spill happened and whether similar spills can be prevented in the future.

In-house bacterial and fungal cultures

Any facility performing bacterial or fungal culture must consider the increased risks associated with these procedures, as well as regional regulations for manipulating biohazardous agents. Some countries (including Canada) also have strict federal regulations in this regard. These mandate full compliance with biosafety level 2 (BSL-2, also referred to as containment

level 2, CL2) practices for any culture of potential pathogens. Regardless of regulations, any clinic performing bacterial culture should be knowledgeable of standard laboratory biosafety practices and be compliant with BSL-2 practices. Guidance for appropriate laboratory safety practices can be found on a number of websites, including those listed in Table 1 below.

Compliance with these practices is feasible for clinics with adequate infrastructure and staffing, but proper containment may not be feasible in terms of cost or time requirement for others. If culture is performed, it must be done right, in terms of both quality and safety. While uncommon in most areas, there are situations where BSL-3 pathogens could be encountered and cultured with routine culture practices. Some examples include *Yersinia pestis* (plague), *Francisella tularensis* (tularemia) and *Brucella* spp. Cultures should never be performed in an on-site clinic laboratory on specimens from animals suspected of harbouring BSL-3 pathogens.

Parasitological examination

Fecal parasitological testing is very commonly performed, and fecal contamination of the local environment is common. Such testing should be performed in a dedicated laboratory area and on surfaces that are easily cleaned and disinfected. Sinks used for fecal analysis should not be used for non-laboratory activities such as cleaning patient equipment or other items.

TABLE 1. Laboratory biosafety resources

Resource	Link
Public Health Agency of Canada Laboratory Biosafety Guidelines, Standards, and Handbook	https://www.canada.ca/en/public-health/services/canadian-biosafety-standards-guidelines.html
Public Health Agency of Canada Veterinary Practices: Physical Design and Operational Practices for Diagnostic Activities	https://www.canada.ca/content/dam/phac-aspc/documents/services/canadian-biosafety-standards-guidelines/guidance/veterinary-practices-physical-design-operational-practices-diagnostic-activities/pub-eng.pdf
US Centers for Disease Control and Prevention Biosafety in Microbiological and Biomedical Laboratories	http://www.cdc.gov/biosafety/publications/bmb15/
World Health Organization Laboratory Biosafety Manual	www.who.int/csr/resources/publications/biosafety/Biosafety7.pdf

Necropsies

Necropsies are high risk procedures because of potential contact with infectious body fluids, aerosols, and contaminated sharps. Non-essential persons should not be present during necropsy procedures in order to minimize exposure of personnel to these hazards. Personnel involved in or present at necropsies should wear:

- protective outerwear (e.g. designated lab coat, designated scrubs).
- disposable gloves.
- protective eye glasses/goggles, or a full face shield.

In addition, when opening the body cavities of larger animals or for any other heavy cutting, cut-proof gloves which can be washed in the laundry should be used to prevent accidental injury from necropsy blades. Additional precautions for respiratory protection (including environmental controls and face masks) should be employed if power equipment is used, since these instruments increase the amount of potentially infected material that becomes aerosolized. Precautions should also be taken to contain all body fluids from the animal, particularly if release of a large volume is anticipated.

It is recommended that in-clinic necropsies not be conducted on any animal suspected of being infected with a pathogen requiring biosafety precautions above containment level 2 (e.g. *Chlamydomphila psittaci*, *Coxiella burnetti*, *Francisella tularensis*). Instead, the entire body should be submitted to an approved diagnostic laboratory. Ensure that all requirements for shipment of biological samples are met (these can usually be provided by the laboratory in question), including providing notification

of any suspected infectious disease in order to protect laboratory personnel. Material Safety Data Sheets (MSDS) for human pathogens, including many zoonotic pathogens, are available on the Public Health Agency of Canada (PHAC) website (see [References](#)). These sheets list the recommended precautions for handling these pathogens and potentially infectious materials as safely as possible. For more information on risk group classification of infectious agents, visit the American Biological Safety Association website (see [References](#)). Information on the requirements for the different containment levels needed to handle infectious pathogens can be found in the Canadian Biosafety Standards, which are also available online (see [References](#)).

Vaccination of personnel

Vaccination should be considered a last line of protection, but is important for certain diseases. Decisions regarding vaccination policies for personnel should consider the risk of exposure, the severity of disease, whether the disease is treatable, the transmissibility of disease, as well as the quality and safety of the vaccine.

Rabies: Rabies vaccination is indicated for anyone who has a greater than average risk of exposure to the virus.

All veterinary personnel that might have contact with animals should therefore be vaccinated against rabies, except in areas that have been formally declared rabies-free (e.g. some islands or specific countries). This includes lay staff who might have periodic animal contact, such as front office staff. Even animals that are kept indoors can be exposed to rabies by bats, and the disease may not be suspected on initial admission. Rabies vaccines for humans are generally considered safe and highly effective. In areas where rabies is endemic, rabies titres should be checked every 2 years to ensure that the minimum accepted titre is maintained, with re-vaccination provided as required. Additional information on rabies vaccination in people is available in the Canadian Immunization Guide (2015) and on the Centers for Disease Control and Prevention (CDC) rabies website (see [References](#)).

Tetanus: Although bites and scratches are very low risk for tetanus infection, cuts and scratches from other objects or soil contamination of puncture wounds are still a risk. Therefore, tetanus vaccination is indicated in veterinary personnel. Boosters are generally administered every 10 years.

Influenza: Human influenza is a common and highly transmissible disease, even though it is generally considered minimally transmissible to companion animals (but particularly to ferrets and pet pigs). Nonetheless, infected veterinary personnel can rapidly infect their colleagues, and veterinary clinics can act as sources of community spread if infected employees are present. It is reasonable for veterinary clinics to recommend annual influenza vaccination of all personnel (as per the recommendations of the Canadian National Advisory Committee on Immunization (NACI)), and to ensure that personnel have time to visit their physician or a vaccination clinic for this purpose. Employees should also be encouraged to stay home if they are ill.

High-risk personnel

Strict adherence to routine infection control practices should protect against most potential infectious disease risks. High-risk individuals should consult with their physician (and other medical personnel as required) to identify potential hazardous situations that should be avoided or handled using altered practices or precautions. Potential high-risk situations that might be encountered (e.g. managing leptospirosis suspects) should be considered in advance in order to develop a plan to reduce the risk of exposure. It is also important to remember that the **infection control practices of the entire clinic team play a critical role in the overall safety of its individual members.**

Pregnant personnel

Pregnant women working in a veterinary clinic setting may encounter pathogens that can cause disease in any individual but also subsequently risk fetal infection or death (e.g. *Salmonella*, *Leptospira* spp, *Brucella* spp, *Coxiella burnetii*), as well as pathogens that rarely cause disease in pregnant or non-pregnant individuals but which can cause devastating disease in a developing fetus (e.g. *Toxoplasma gondii*). There is also a decrease in cell-mediated immunity in the third trimester that may increase the risk of certain common infectious diseases, particularly those caused by viruses and fungi.

All personnel, including temporary lay personnel, kennel staff, students and volunteers, should receive education and training about injury prevention and infection control.



Immunocompromised individuals

In general, immunocompromised individuals are at increased risk of infection from pathogens that do not (or rarely) cause disease in healthy individuals, and severe disease compared to infections in immunocompetent individuals (e.g. salmonellosis, cryptosporidiosis). Individuals with a known immunodeficiency should take extra care to follow routine infection prevention practices and avoid high risk situations.

Training and education of personnel

Personnel training and education are essential components of an effective infection control program. All personnel, including temporary lay personnel, kennel staff, students and volunteers, should receive education and training about injury prevention and infection control during their initial orientation and periodically thereafter. Additional training should be provided as recommendations change or if problems with infection control practices are identified. Training should emphasize awareness of the hazards associated with individual work duties, and prevention of zoonotic disease exposure. Staff participation in training should be documented by the infection control practitioner (ICP). A variety of helpful training resources are available (Gibbins 2015 below).

References

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