CLOROX HEALTHCARE™

# CLEAN HANDS AND CLEAN SURFACES

## HEALTHY PRACTICES IN VETERINARY AND PET CARE SETTINGS

HEROES FOR HEALTHY PETS™

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# Introduction

In the USA, companion animal ownership has been steadily increasing. In 2012, around 44 million households, just over a third, owned a total of 70 million dogs, while 36 million households owned a total of 74 million cats. These households combined made 170 million visits to a veterinarian annually.[1] With each visit comes the risk of a companion animal contracting an infection, the most common of which include canine parvovirus, dog flu (canine influenza), canine distemper, canine infectious cough, panleukopenia (feline distemper), and feline leukemia.

## INFECTION CONTROL
## BY THE NUMBERS

- 70 million dogs
- 74 million cats
- 170 million vet visits annually[1]

In a 2008 survey of 38 veterinary hospitals, over 80% reported an outbreak of any infectious disease in the previous five years.[2] 50% reported transmission to personnel in the previous two years.[2]

In September 2017, the CDC reported that a multi-state outbreak of *Campylobacter jejuni* in almost 40 humans in 7 states was linked to infected puppies sold through a pet store chain. By January 2018, there had been 113 cases reported in 17 states.[5]

**As a result of having an ineffective infection control program, an outbreak of Salmonellosis cost a large teaching veterinary hospital $4.12 million.[6]**

Outbreaks of infectious diseases in veterinary facilities are not uncommon. In a 2008 survey of 38 veterinary teaching hospitals, over 80% reported an outbreak in the previous five years.[2] If an outbreak starts, the transmission of infectious diseases can be rapid and widespread. In 2015, an outbreak of canine influenza H3N2 in Chicago sickened over one thousand dogs. It was thought that the strain had possibly arisen following the transmission to dogs of an avian influenza virus circulating in live bird markets in Southeast Asia. In 2016, it was discovered that infected dogs had spread the virus to cats in an Indiana shelter. By 2017, the virus had spread to dogs in 10 states in the Midwest and South.[3] While clinical signs were typical of dog flu – fever, loss of appetite, nasal discharge, coughing and lethargy, some dogs showed no signs.

Companion animals are the potential source of over 70 human infections.[4] In a 2008 survey of veterinary teaching hospitals, 50% reported zoonotic infections occurring in the two years prior to the survey.[2] Infected companion animals may also spread infections to their owners; in September 2017, the CDC reported that a multi-state outbreak of *Campylobacter jejuni* in humans was linked to infected puppies sold through a pet store chain.[5] Although the risk of transmission to humans is low, it is increased for those with compromised or under-developed immune systems such as the very young, elderly and chronically sick.

# Introduction

*The pathogens that cause infectious diseases in companion animals can be transmitted by a number of routes:*

1. **Respiratory secretions** emitted as droplets or aerosols when coughing, barking or sneezing.
2. **Aerosols or droplets** can also settle on surfaces in kennels, and on objects such as food and water bowls, and the **contaminated surfaces** then become routes of transmission.
3. **Saliva** from pets can also contaminate surfaces and people who come into contact with infected animals, making hands a route of transmission.
4. **Urine, feces, and vectors** like ticks and mosquitos.

Pathogens can survive on hard and soft surfaces for hours, days and even weeks, so regular and correct cleaning, disinfecting, and hand hygiene are all critical behaviors to break the chain of transmission and stop the spread of infectious diseases.

The case and need for a comprehensive infection prevention and biosecurity program is also strengthened when considering the high costs of infectious disease outbreaks. As a result of having an ineffective infection control program, an outbreak of Salmonellosis cost a large veterinary teaching hospital $4.12 million in direct costs.[6]

# Elements of an effective environmental infection prevention program

## Element 1: Clean Hands

### 1. Why are clean hands important?

We touch objects and people with our hands hundreds, if not thousands of times a day. It should not be surprising to learn that 80% of infectious diseases are spread through the hands, either directly, or indirectly.[7] Common pathogens can be transferred to hands from infected animals, or from touching contaminated surfaces, making hand hygiene one of the most important first lines of defense.

### 2. Which hand hygiene products should I select?

Correct washing of hands with soap and water is the most effective way of removing pathogens. This should be practiced whenever possible, and especially if hands are visibly soiled. If soap and water is not readily available, then an alcohol-based hand rub (ABHR) containing at least 60% alcohol should be used. There are many hand hygiene products on the market but focusing on the information in Table 1 will help you select the right products for your facility.

**Table 1. Key factors to consider when selecting hand hygiene products for your facility.**

| Product | Usage and limitations | Selection considerations |
|---|---|---|
| Soap and water (plain or antimicrobial) | • First choice whenever possible<br>• When hands are visibly soiled | • **Involve team members in the product selection process**<br>• **Evaluate the product over multiple days**<br>• **Important product features to consider:**<br>- Ingredients: Does it contain an antimicrobial (soaps) or emollients (soaps and ABHR)?<br>- Form: Is it a spray, foam, or liquid?<br>- Product consistency<br>- Skin feel after frequent use<br>- Ability to quickly glove up after using product<br>- Fragrance profile during and after use<br>• **Dispensers: Can they reliably deliver the appropriate amount of product during each use?** |
| Alcohol-based hand rub (ABHR) | • When hands are not visibly soiled<br>• When soap and water is not available<br>• Does not work against some pathogens (e.g. canine parvovirus, *Clostridium difficile* spores) | |

## Element 1: Clean Hands

### 3. When should I complete hand hygiene in veterinary settings and pet businesses?

In your daily activities at your veterinary, pet boarding or pet grooming facility, there are five key moments when you should practice hand hygiene.

1. Before and after touching animals, their environment, or bodily fluids
   - Don't forget that the environment includes their cages and the surfaces in the room that they are housed, regardless of whether they are sick or relatively healthy
   - Wash hands after contact with urine or feces, even if gloves were worn
2. When leaving or entering a group setting or a new location in the facility
3. After glove removal
   - Incorrect removal of gloves may contaminate hands, and tears and holes in gloves may also permit contact with the skin
4. After using the bathroom
5. Before eating, drinking or smoking while at work

# Element 1: Clean Hands

## 4. What's the proper technique for hand hygiene?

Hand washing with soap and water, and hand rubbing with an alcohol-based hand rub must be done correctly and thoroughly to be maximally effective. The diagrams below show the proper techniques.

### Hand Washing Steps

**1. The Drenching**
With faucet at full speed, wet hands and apply soap.

**2. The Splish Splash**
Give hands a good bath. Wave goodbye to the dirt and other nasties.

**3. The Waterfall**
Let cool (or warm) water cascade over now-clean hands as soap rinses away.

**4. The Dry Out**
Use a fresh paper towel or air hand dryer.

*This process should take 30 seconds*
*(or the same time as singing happy birthday twice)*

### Hand Rubbing Steps

**1. The Claw**
Spray palm side of each hand holding fingers in the claw position.

**2. The Fingertip Shuffle**
Shuffle fingertips in palm of wet hand. Repeat with other hand.

**3. The Dovetail**
Lock fingers together on both hands and move in and out.

**4. The Rub**
Rub hands together until they are dry.

## Element 1: Clean Hands

### 5. How do we ensure hand hygiene compliance in our facility?

Hand hygiene compliance in human healthcare settings averages around 40% but varies from 5% to 81%.[8,9] Compliance in companion animal veterinary practices averages about the same as in human healthcare settings.[10,11]

Three of the most common reasons for not practicing hand hygiene are forgetting to do so, non-availability of hand hygiene products, and skin irritation issues. Interventions and initiatives that can help to drive compliance include the following[12]:

- Increasing the accessibility of hand hygiene products, especially alcohol-based hand rubs
- Open promotion of hand hygiene by all staff
- Hand hygiene education programs
- Displaying posters and instructions on correct hand hygiene
- Monitoring hand hygiene and providing feedback to staff

# Elements of an effective environmental infection prevention program

## Element 2: Clean Surfaces

### 1. Why are clean surfaces important?

Clean surfaces are important for aesthetics and for the health of visitors and staff. A clean facility free of unpleasant odors makes a good impression to pet owners. Additionally, a clean facility helps prevent the spread of infection. As we saw in Element 1, contaminated hands can spread pathogens from person to person. An infected animal or person may also transmit pathogens to environmental surfaces when they touch them. In turn, these can be transmitted to other animals and people who touch the surfaces, continuing the chain of transmission. Numerous studies in hospitals have shown that pathogens are found on a range of surfaces and can be transmitted around facilities very quickly.[13] Pathogens can survive on surfaces for days, weeks, even months, depending on the pathogen and surface conditions (Table 2).[14] Regular cleaning and disinfection of environmental surfaces helps to prevent the spread of infections, and in the case of outbreaks, may be able to stop transmission.

**Table 2. Surface persistence of common veterinary-associated pathogens**

| PATHOGEN CLASS | PATHOGENS* | SURFACE PERSISTENCE |
|---|---|---|
| Bacteria | *Escherichia coli* | 1.5 hours to 16 months |
| | *Bordetella bronchiseptica*[15] | A few hours in respiratory secretions |
| | *Salmonella typhimuriam* | 10 days to 4.2 years |
| | *Campylobacter jejuni* | Several hours (dry); 3-4 hours (moist) |
| | *Chlamydia psittaci* | Up to 15 days |
| | *Mycobacterium bovis* | >2 months |
| | *Leptospira* | Up to several months† |
| Viruses | Canine distemper virus[16] | Several hours |
| | Feline calicivirus | 8 hours to 7 days |
| | Avian influenza, Avian metapneumonia virus[17] | 3-6 days |
| | Pseudorabies virus | ≥ 7 days |
| | Canine parvovirus | 1 year |

*** Unless cited, all data is from Kramer A, Schwebke I, Kampf G. How long do nosocomial pathogens persist on inanimate surfaces? A systematic review. BMC Infect. Dis. 2006, 6, 130-137.**

**† Pathogenic *Leptospira* spp. do not multiply outside the host. In the environment, they require high humidity for survival and are killed by dehydration or temperatures greater than 50°C (122°F). These organisms may remain viable in the environment for several months under optimal conditions, e.g., in water or contaminated soil. They survive best in bodies of water that are slow-moving or stagnant.**

# Element 2: Clean Surfaces

## 2. What does clean mean?

"Clean" can mean different things to different people, but it's important to know that there are four common terms associated with cleaning in healthcare settings, each with an accepted definition.

| Cleaning | Sanitization | Disinfection | Sterilization |
|---|---|---|---|
| Manual or mechanical removal of debris and soil.<br>Provides basic hygiene; prepares items for decontamination. | Decreases the number of infectious agents to safe levels, as judged by public health requirements | Destroys or inactivates most harmful microorganisms | Kills all viable microorganisms on a product or surface |
| Example: Sweeping floors before disinfection | Example: Sanitizing food preparation areas | Example: Chemical disinfection of kennels | Example: Sterilizing surgical instruments |

**Knowing the differences between these terms is important as you develop your facility's infection control plan.**

## 3. How easy is it to kill pathogens on surfaces?

The susceptibility of microorganisms to disinfectants varies. Some viruses are very susceptible to common disinfectant chemistries such as quaternary ammonium-based products, while others such as bacterial spores are resistant to most disinfectants except bleach (sodium hypochlorite).

Figure 1 (next page) shows the general susceptibility to disinfectants of a range of microorganism types.

## Element 2: Clean Surfaces

**Figure 1. Susceptibility of microorganism types to disinfectants**

| Disinfectant Susceptibility | Type | Examples |
|---|---|---|
| EASY TO KILL  | Enveloped viruses | Avian influenza, Canine influenza, Nipah virus, Newcastle disease virus (paramyxoviridae), Avian Infectious Bronchitis virus (Coronavirus), Canine distemper virus (Paramyxoviridae), Canine coronavirus, Equine herpesvirus, Equine influenza A, Feline Infectious Peritonitis Virus (Coronavirus), Feline Rhinotracheitis virus, Infectious Laryngotracheitis virus, Marek's disease virus (Gallid herpesvirus 2), Pseudorabies virus |
| | Gram positive bacteria | *Dermatophilus congolensis, Actinomyces viscosus* |
| | Large non-enveloped viruses | Avian adenovirus (medium), Avian reovirus |
| | Gram negative bacteria | *Bordetella bronchiseptica, Brucella* spp., *Leptospira* spp., *Chlamydia psittaci* |
| | Fungi | *Microsporum canis, Trichophyton mentagrophytes, Blastomyces dermatitidis, Aspergillus* spp., *Coccidioides immitis* (causes Coccidioidomycosis, or Valley Fever), *Cryptococcus* spp., *Histoplasma capsulatum* |
| | Small non-enveloped viruses | Canine parvovirus, Feline calicivirus, Feline picornavirus |
| | Mycobacteria | *Mycobacterium tuberculosis, Mycobacterium bovis, Mycobacterium avium* complex |
| HARD TO KILL | Bacterial spores | *Clostridium difficile, Clostridium perfringens* |

**Adapted from McDonnell G, Burke P. Disinfection: is it time to reconsider Spaulding? J Hosp Infect. 2011; 78:163-170; Spaulding EH. Chemical disinfection and antisepsis in the hospital. J Hosp Res 1972; 9:5-31.**

## Element 2: Clean Surfaces

Three types of antimicrobial active ingredients are commonly used in disinfectants found in animal facilities.

| Class | Mechanism of action | Examples |
|---|---|---|
| Oxidizing agents | • Destruction of proteins and other molecules that constitute microorganisms through oxidation of molecular bonds | • Bleach (sodium hypochlorite)<br>• Potassium peroxymonosulfate<br>• Hydrogen peroxide ("Improved" or "Activated") |
| Quaternary ammonium compounds | • Permeate cell membranes and disrupt the function of the cell | A number of quaternary ammonium compounds are used in disinfectants<br>Example: alkyl dimethyl benzyl ammonium chloride |
| Alcohol | • Dehydration and destruction of outer cell membranes | Ethanol, isopropanol |

Figure 2 (next page) shows the general effectiveness of disinfectant active ingredients against the many types of microorganisms encountered in healthcare and veterinary settings, based on EPA-registered disinfection claims for hard surface disinfectants.[18]

- In general, bleach is one of most effective disinfectants, able to kill the hardiest microorganisms such as bacterial spores (*Clostridium difficile* spores for example)
- Potassium peroxymonosulfate and improved or activated hydrogen peroxide products are generally effective against small non-enveloped viruses in addition to bacteria, mycobacteria, enveloped viruses and fungi
- Quaternary ammonium compound-based disinfectants are effective against many bacteria, but are generally less effective against small non-enveloped viruses, mycobacteria and bacterial spores
- Alcohols are rapid acting disinfectants and can kill some bacteria, but are ineffective against small non-enveloped viruses, most fungi, mycobacteria and bacterial spores

## Element 2: Clean Surfaces

**Figure 2. Effectiveness of disinfectant active ingredients against types of microorganisms**

| Disinfectant Susceptibility | Type | Disinfectant Efficacy |
|---|---|---|
| EASY TO KILL | Enveloped viruses | Ethanol Isopropanol; Quaternary ammonium compounds; Potassium peroxy-monosulfate; Hydrogen peroxide; Bleach |
| | Gram positive bacteria | |
| | Large non-enveloped viruses | |
| | Gram negative bactieria | |
| | Fungi | |
| | Small non-enveloped viruses | |
| | Mycobacteria | |
| HARD TO KILL | Bacterial spores | |

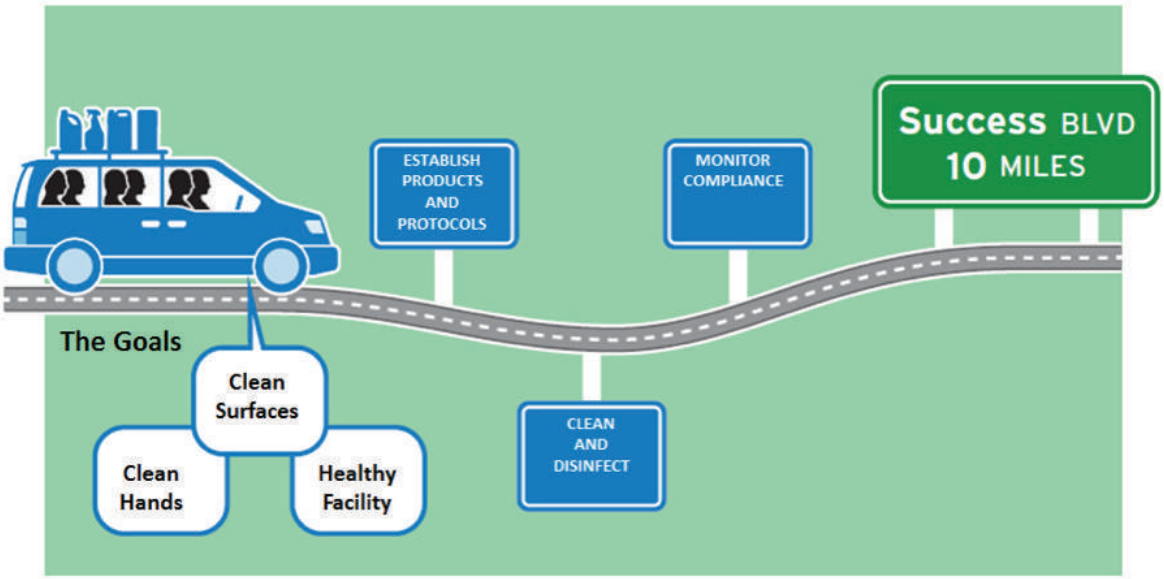
### Key Takeaways from Element 1 – Clean Hands, and Element 2 – Clean Surfaces:

- Hands are a common way to spread pathogens.
- Practicing regular and effective hand hygiene based on the five key moments of hand hygiene, either through hand washing or use of an alcohol-based hand rub, can reduce the risk of pathogen transmission.
- Environmental surfaces can also be key links in the chain of pathogen transmission throughout your facility, and from animals to humans.
- Effective cleaning and disinfecting is a core component of an infection prevention plan.
- The disinfectants used in your facility should be able to kill and inactivate the pathogens of concern that may be present in your facility.

Element 3 will take you through the basic steps needed to develop an environmental disinfection program for your facility's infection prevention plan. It will also provide protocol recommendations for cleaning for the different areas of your facility, together with tips and tricks on how best to clean and disinfect surfaces.

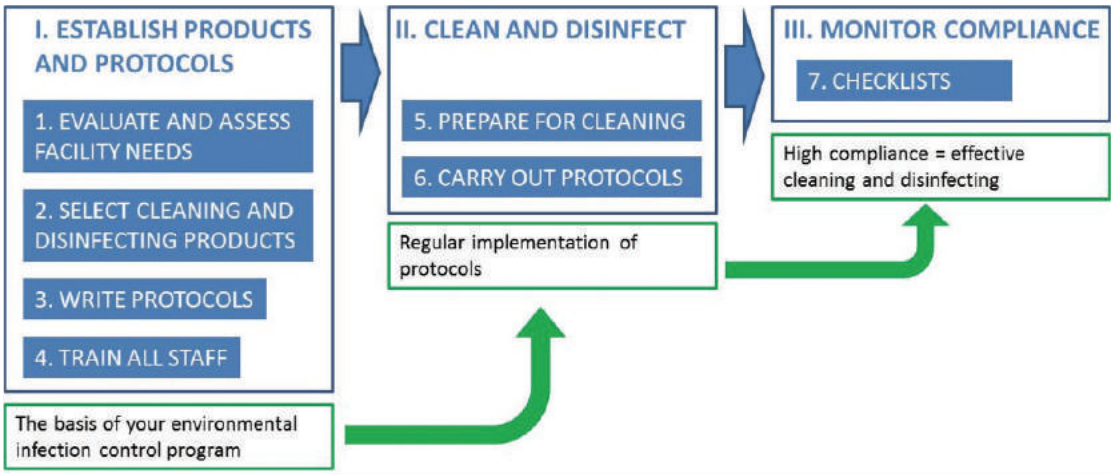
# Elements of an effective environmental infection prevention program

## Element 3: Your infection prevention roadmap




Every veterinary hospital and veterinary clinic, pet boarding and pet grooming facility should have a comprehensive infection prevention plan, developed in keeping with any local, state or federal requirements. Environmental cleaning and disinfection should be a key component of your facility's plan. The scope of the program will differ depending on the facility; for veterinary hospitals and veterinary practices, the program should cover all areas of the facility, from the waiting room to isolation areas. Programs for pet-grooming and pet-boarding or exercise facilities will need to be tailored to those environments and the often rapid turnover of pets in those facilities. Figure 3 shows the three areas of activity that are part of the infection prevention roadmap.

**Figure 3. Three focus areas for an infection prevention program**



# Elements of an effective environmental infection prevention program

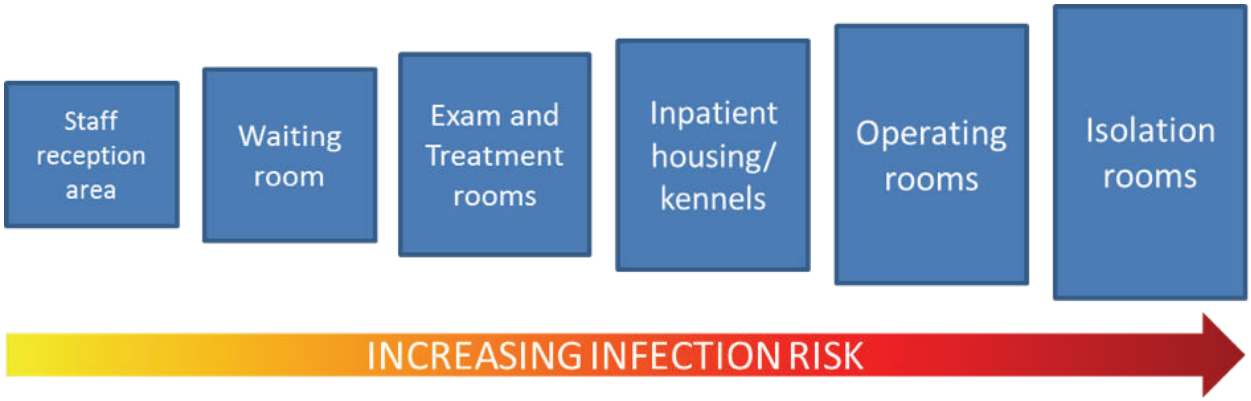
## Element 3 - I: Your Infection Prevention Roadmap

## Establish Products and Protocols

### 1. ASSESS your facility's needs

When evaluating the infection prevention needs of your veterinary facility or pet care business, there are four things to consider.[19]

1. **Biosecurity risk in different areas.** Veterinary facilities may be segregated into a number of sections with increasing infection transmission risk: Surfaces in all of these areas have the potential to harbor pathogens, although the risk will vary.




2. **The risk from specific pathogens.** In most veterinary facilities, respiratory and gastroenteritis pathogens are likely to be of greatest concern as they are common and contagious. In surgical facilities, the risk of infection from pathogens, especially those that are drug-resistant are of concern.
3. **The modes of transmission of pathogens of concern.** Whether at risk pathogens are spread through the surface, droplet, airborne or animal-animal contact should be taken into consideration.
4. **The risk from zoonotic infections that can be transmitted to humans.**

Taking all these factors in account will enable you to determine the contents of your infection control plan, what products and tools are needed, and the responsibilities of staff.

# Element 3 - I: Your Infection Prevention Roadmap

## Establish Products and Protocols

### 2. SELECT cleaning and disinfection products

The selection of cleaning and disinfection products and tools and equipment will be driven by the biosecurity risk evaluation and there are a number of factors to consider when selecting products for your facility's needs (Table 3).

**Table 3. Cleaning and disinfection product selection criteria to consider**

| FACTOR | Notes |
|---|---|
| **Is the disinfectant EPA registered?** | EPA approval indicates that the product should perform as expected when used according to directions for use. |
| **Does it have EPA-registered claims for the microorganisms identified in the biosecurity risk assessment?** | EPA-registered claims will ensure that the disinfectant is effective against approved pathogens, typically on non-porous hard surfaces. Some products are EPA-registered to kill bacteria on soft surfaces and will carry soft surface sanitization claims. |
| **Is the contact time suitable for the facility?** | The contact time is the length of time that a disinfectant needs to stay wet on the surface in order to inactivate microorganisms. Note that the contact time may not be the same for all approved microorganisms. |
| **Is the safety rating and the personal protective equipment required acceptable?** | Information on safety and personal protective equipment (PPE) requirements for EPA-registered disinfectants is required to be included on product labels. |
| **Do you need dilutable and/or ready-to-use (RTU) cleaners and disinfectants?** | Some cleaners and disinfectants require accurate dilution before using, and may have a limited shelf life once prepared. Often, "at use" solutions need to be prepared fresh on a regular basis, sometimes daily.<br>RTU cleaners and disinfectants can be used directly from the container, and in some cases, may have longer shelf lives. |
| **Is the disinfectant a one-step cleaner-disinfectant, or is a cleaning step required prior to disinfecting?** | Prior to application, ALL products require the removal of gross soil such as pet hair, urine, and feces. The presence of organic soil and dirt on surfaces may affect disinfecting efficacy.<br>If a disinfectant does not contain a surfactant, then a pre-cleaning step will be required. One-step cleaner-disinfectants can be used for both the cleaning and disinfection steps and, when surfaces are not visibly soiled, to clean and disinfect at the same time. |

## Element 3 - I: Your Infection Prevention Roadmap

## Establish Products and Protocols

Follow these tips when reading the different sections of the product label to make sure that the disinfectant you select meets your needs.

### DIRECTIONS FOR USE

- Remember that this section always begins with the following statement "It is a violation of Federal law to use this product in a manner inconsistent with its labeling." This statement means that the product should always be used as intended and directed on the label.
- Check the Directions for Use section to determine whether this is a ready-to-use product, or whether it requires dilution prior to use.
- If dilution is required, the label should provide instructions for correct dilution for disinfecting specific surfaces or objects.
- Read instructions for "DISINFECTION" and if applicable, "SOFT SURFACE SANITIZATION" to ensure that you will be able to follow them in your facility.
- Check to see if the product is effective in the presence of organic soil.
- Review any warning language about situations in which this product should not be used and, if so, how to avoid incorrect usage in your facility.
- Review special instructions sections. For example, a disinfectant may have instructions for use against blood borne pathogens, or on surfaces contaminated with blood and bodily fluids. Or, pre-cleaning may be required prior to the application of the disinfectant.

### ORGANISMS/DISINFECTION CLAIMS

- Read this section to see what bacteria, virus and fungi the product has EPA-registered claims against. Make sure that it is active against the types of pathogens encountered in your facility.
- Make sure that the contact time (the time a disinfectant must stay wet on a surface to be effective) is consistent with how you plan to use it in your facility.

### USE SITES

- This section will list the types of surfaces and materials that the product can be used on.
- Make sure that it is compatible with surfaces in your facility.
  - Read equipment cleaning and care guides for recommended disinfectants. Reach out to equipment manufacturers for questions about disinfectant compatibility with specific pieces of equipment.

# Element 3 - I: Your Infection Prevention Roadmap

## Establish Products and Protocols

### PRECAUTIONARY STATEMENT

- This section describes the hazards of the product, e.g. "HAZARDS TO HUMANS AND DOMESTIC ANIMALS". This doesn't mean that the product should not be used around humans and domestic animals, but that the product may be harmful if used incorrectly.
- Information on what personal protective equipment (PPE) should be worn when using the product. This information can also be found on the Safety Data Sheet (SDS) (formerly called the material safety data sheet).
- A signal word such as "CAUTION" or "DANGER" will be followed by a description of health hazards and FIRST AID recommendations. Make sure that you are comfortable using this product in your facility. The SDS for the product will provide additional information about product characteristics and safety.

### STORAGE AND DISPOSAL

- Check to see that the product is appropriate for your storage conditions, and how you will dispose of it.

### OTHER POINTS TO NOTE

- Look for an EPA registration number. Every EPA-registered disinfectant must have this number.
- Look for the shelf life. This may be written as a month and a year, but may also be a date of manufacture, with an indication as to how long the shelf life is (i.e. 12 months).

## Element 3 - I: Your Infection Prevention Roadmap

## Establish Products and Protocols

### 3. DEVELOP protocols

While each veterinary facility will be unique in design, areas of the facility will be similar. The level of risk in each area should be considered when developing protocols. Protocols for veterinary hospitals, clinics and other group settings such as pet grooming facilities and pet boarding facilities should include the following:

- Separate protocols for each area of the facility
- What products are to be used and how they are to be used (dilution, method of application, contact time)
  - If products that need dilution are used, instructions should be included
- What tools should be used – microfiber cloths, brooms, mops
- List of tasks for each area (e.g. emptying garbage, wiping exam tables, and scales)
- What surfaces in the room should be cleaned and disinfected and with what frequency
- Recommendations for how much time cleaning and disinfection will take
- Who is responsible for cleaning and disinfection. Develop a schedule for cleaning and disinfection such as the example below:

| Item | Location | When to clean? | Who's responsible for cleaning? | Product? |
|---|---|---|---|---|
| **Exam Table** | Exam room | Between patients | Vet Tech | Wipe A |
| **Countertops + Sink** | Exam room | Between patients | Vet Tech | Wipe B |
| **Ultrasound Machine** | Exam room | Daily | Vet Tech | Wipe A |
| **Kennels** | Boarding Areas | Between patients | Vet Tech | Product C |
| **Reception Area** | Front of Office | Daily | Office manager | Wipe A |

## Element 3 - I: Your Infection Prevention Roadmap

## Establish Products and Protocols

- Instructions for tough cleaning jobs
  - For example, if surfaces are contaminated with pet hair, urine, feces, vomit or blood, the organic material should be cleaned up first prior to disinfection
- What personal protective equipment should be worn
  - At a minimum, gloves should be used for cleaning. Eye protection, gowns and boots may also be necessary depending on the product being used and what is being cleaned and disinfected and the risk from pathogens of concern.
- How monitoring is to be done (ie, checklists, inspection schedule)

Suggested protocols and checklists are outlined in Activity III, Monitoring Compliance.

### 4. TRAIN your staff and assign responsibilities

- Remember best practices of cleaning and disinfecting:
  - Clean from high to low: Starting on higher surfaces and clean towards lower surfaces so that any dirt or dust that is dislodged drops on to lower, dirty surfaces which are then cleaned
  - Wipe from clean to dirty: This reduces the transfer of foreign materials such as dirt and pathogens.
- Remove odorous medical waste as soon as it is generated
- Practice makes perfect
  - Have your teams demonstrate competency through practice
  - Periodically test and review their knowledge of the cleaning and disinfecting protocols
- Document cleaning and disinfecting responsibilities and frequencies
  - Create a grid which contains key surfaces and equipment, who is responsible for cleaning and disinfecting and how often cleaning and disinfection should take place

# Elements of an effective environmental infection prevention program

## Element 3 - II: Clean and Disinfect

### 5. Prepare for cleaning

- Gather supplies needed such as cleaning and disinfectant products, dusters, brooms, microfiber cloths, mops, buckets
- Perform hand hygiene before beginning to clean and disinfect
- Don personal protective equipment (PPE) such as gloves, gowns, boots and eyewear if required by the instructions on the product label

### 6. Carry out protocols

#### Clean

- Inspect surfaces to see if there is any visible soil or organic material such as urine, feces, vomit or pet hair
- Pick up organic material and clean surfaces with soap or a detergent-based cleaner, then rinse

#### Disinfect

- Apply an appropriate EPA-registered disinfectant
- Ensure that the disinfectant stays visibly wet on the surface for the contact time required by the product label
- Rinse and dry with a clean towel or squeegee
- Floors:
  - When disinfecting floors, applying the disinfectant by spraying then rinsing is the preferred method. Spray application does not contaminate the disinfectant whereas continual dipping of the mop after using it on the floor can contaminate the disinfectant.
  - If you don't have drainage to rinse, use the two-bucket system for mopping — a bucket of clean water and a bucket of disinfectant. The rinse step between disinfecting and putting the mop back in the disinfectant reduces the risk of contamination.

**Remember: While not a requirement, the AVMA has issued guidelines on the disposal of medical waste and animal handling that cite Occupational Safety and Health Administration (OSHA) blood borne pathogen standards,[20] even though the OSHA standard only applies to human blood products or blood products known to be infected with HIV or Hepatitis B.[21]**

# Element 3 - II: Clean and Disinfect

## Tips on cleaning and disinfecting specific areas of the facility:

### For Veterinary Facilities – Cleaning and Disinfection Checklist

| FACTOR | Notes |
|---|---|
| Staff reception area | • Keep the desk tidy<br>• Regularly sweep the floor<br>• Follow protocols for daily cleaning and disinfecting of hard non-porous surfaces<br>• Regularly clean counters, desks, computer keyboards and mouse, and writing utensils<br>• Provide hand hygiene products (i.e. hand sanitizer) to staff and visitors and encourage frequent usage, especially during cold and flu season |
| Waiting room | • Sweep the floor regularly<br>• Clean and disinfect at the end of the day<br>• Clean up pet hair, feces, urine, vomit and blood then immediately disinfect the surface<br>• Ensure the area is well ventilated. If necessary, use odor elimination products periodically<br>• Soft surfaces can harbor and transmit germs—consider using a soft surface sanitizer on chairs, rugs and cushions |
| Exam and treatment rooms | • Clean and disinfect all surfaces – countertops, tables and floors - after each patient<br>• Apply disinfectant and allow surface to remain wet for the contact time, then polish surfaces with a clean dry or damp cloth to remove excess product or residue, especially if animals will come into contact with these surfaces<br>• Reusable equipment such as scales should be disinfected after each use<br>• Garbage should be emptied regularly. Remove odorous medical waste when it is generated |
| Inpatient housing/ kennels | • Clean in life-stage groups: puppies first, healthy adult dogs second, and sick or injured dogs last<br>• Remove the dog and place in a clean, empty kennel<br>• Remove food and water bowls. Clean with a detergent, apply a disinfectant, allowing it to stay wet for the contact time. Rinse and dry<br>• Launder bedding on a regular schedule, and for each new dog<br>• Sweep up hair and remove any feces or solid organic matter<br>• Clean from high to low, starting with the ceiling, walls, door then floor, with a detergent-based cleaner, then rinse<br>• Apply disinfectant and allow surface to remain wet for the required contact time. Then rinse all surfaces. Dry with a squeegee then air dry, or with clean towels or paper towels<br>• Thoroughly disinfect the items after every use, or use a separate set of cleaning equipment for each life-stage group |

# Element 3 - II: Clean and Disinfect

## Tips on cleaning and disinfecting specific areas of the facility *(continued)*:

| FACTOR | Notes |
|---|---|
| Operating rooms | Similar tips apply as for cleaning and disinfecting exam and treatment rooms but some additional precautions are required:<br>• Make sure to clean surfaces contaminated with blood or bodily fluids prior to disinfecting (as per OSHA guidelines for bloodborne pathogens)<br>• Clean and disinfect the operating room after each patient<br>• Dispose of medical waste according to local, state and federal regulations |
| Isolation rooms | Similar tips apply as for cleaning kennels, but additional precautions are required<br>• Additional PPE such as gowns, boots and eyewear may be required, depending on the animal's infection<br>• Do not share food and water bowls with other dogs, even if they are disinfected<br>• Have separate trash cans and cleaning and disinfecting equipment<br>• Double bag all garbage before removing it from the room<br>• Clean and disinfect regularly if an animal is shedding a pathogen via bodily fluids or feces<br>• Dedicated water resistant footwear is recommended |

**Remember –** practice hand hygiene after cleaning and disinfecting, even if you have worn gloves

### For Pet Boarding/Grooming Facilities

Many of the tips and tricks for veterinary hospitals and clinics are applicable to pet boarding and grooming facilities, especially in relation to how areas of the facilities are cleaned and disinfected. However, there are some additional tips for these types of facilities.[22]

- Equipment and surfaces in the facility should be easy to clean and disinfect after repeated contact with dogs. If this is not possible, there should be dedicated equipment for individual dog use
- Surfaces such as floors should be non-porous wherever possible for easy cleaning and disinfecting
- In pet grooming areas, equipment such as clippers and other grooming tools, and food and water bowls should be routinely cleaned and disinfected before use with each animal

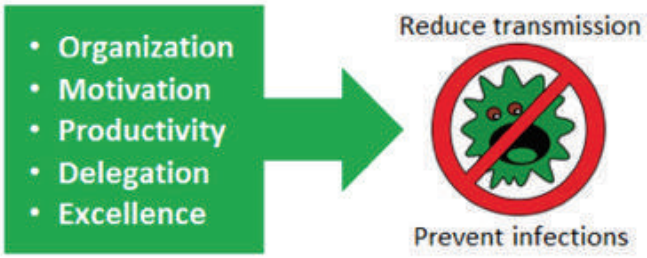
**Remember –** practice hand hygiene after cleaning and disinfecting, even if you have worn gloves

# Elements of an effective environmental infection prevention program

## Element 3 - III: Monitor Compliance

### 7. Checklists

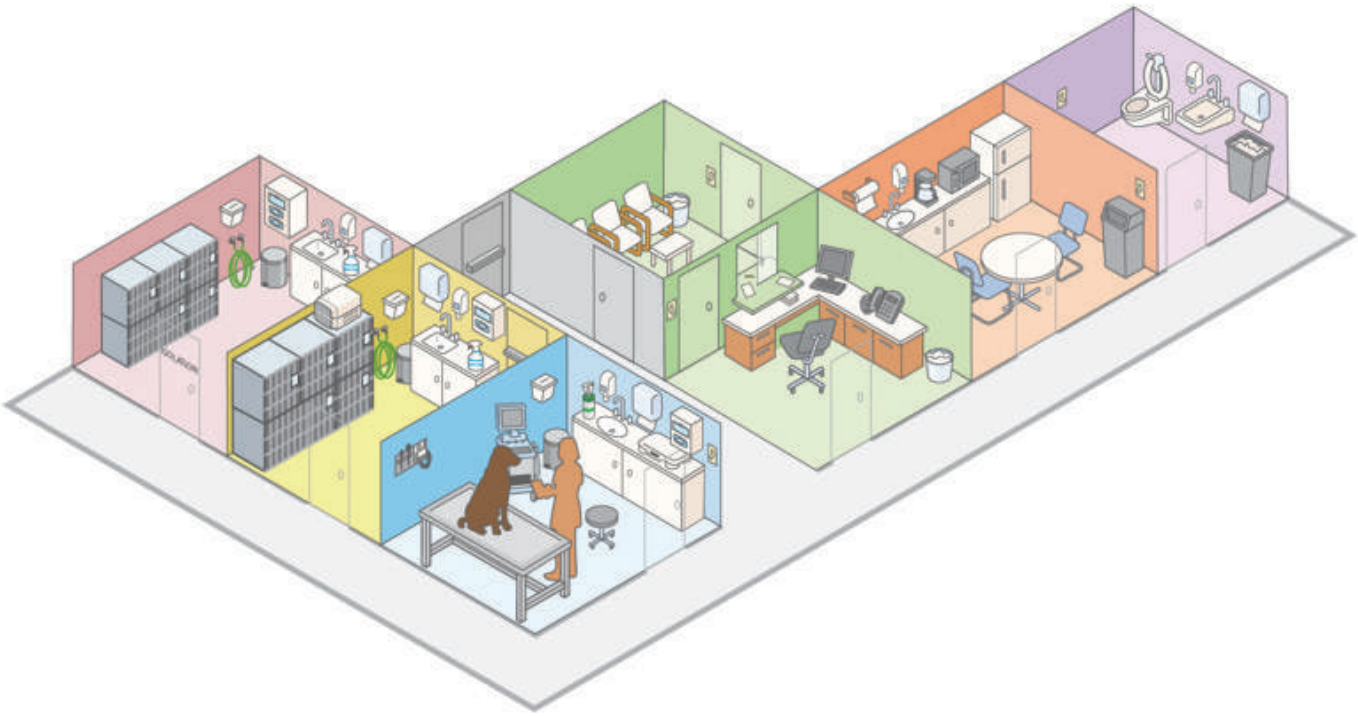
These are valuable tools that can help to organize, delegate, and motivate staff to clean and disinfect correctly and effectively, and ultimately reduce the risk of transmission of infectious diseases.




- Use checklists when cleaning and disinfecting to help ensure you've carried out all the protocols
- Use separate checklists for each area of the facility

Recommendations for items to include in cleaning and disinfection checklists for veterinary, pet boarding and grooming facilities are shown below.

**For Veterinary Facilities – Cleaning and Disinfection Checklist**



## Element 3 - III: Monitor Compliance

### Exam/Treatment/Operating Rooms

Surfaces in these rooms that come into contact with animals should be cleaned and disinfected after each patient. Other surfaces can be cleaned and disinfected daily.
Remember: Clean, Disinfect, Rinse

- Clean to remove gross filth and soil
- Apply the disinfectant and allow surface to stay wet for the contact time
- Rinse off excess product or remove with a clean dry or damp cloth, especially if animals will come into contact with these surfaces

Empty garbage regularly and remove odorous medical waste immediately after it has been generated.

| Daily cleaning and disinfection | After each patient |
|---|---|
| • Countertops and Sink<br>• Light switches<br>• Door handles<br>• Floors (vacuum and mop)<br>• Walls<br>• Empty Garbage | • Exam table/operating table<br>• Scales<br>• Diagnostic Equipment *check manufacturer recommendation<br>• Dispose of odorous medical waste immediately |

### Isolation Areas

Additional precautions are necessary for isolation rooms. They should be cleaned and disinfected on a daily basis if an animal is shedding a pathogen via bodily fluids or feces. In addition to gloves, additional PPE such as gowns, boots and eyewear may be required, depending on the animal's infection. Pay special attention to food and water bowls. Double bag all garbage. Isolation rooms should be cleaned and disinfected on a regular basis even if unoccupied.

| Daily cleaning and disinfection |
|---|
| • Countertops and Sink<br>• Light switches<br>• Door handles<br>• Floors (vacuum and mop)<br>• Walls and cages<br>• Food and water bowls<br>• Empty garbage and double bag |

## Element 3 - III: Monitor Compliance

### Cages/Kennels

Kennels and cages in boarding facilities should be cleaned and disinfected daily. Wear appropriate PPE. First remove all items. Sweep or vacuum surfaces to remove organic material such as pet hair, urine and feces. Clean from top to bottom to reduce the risk of cross-contamination. First clean surfaces to remove all visible soil, then disinfect all surfaces. Rinse and dry. Replace clean and disinfected items.

- Ceiling
- Walls
- Doors
- Floors
- Food and Water bowls
- Toys
- Bedding (launder regularly)

**Laundry Best Practices:** Clothing and pet bedding should be washed using a hot cycle with bleach and detergent and dried in a hot dryer.[23]

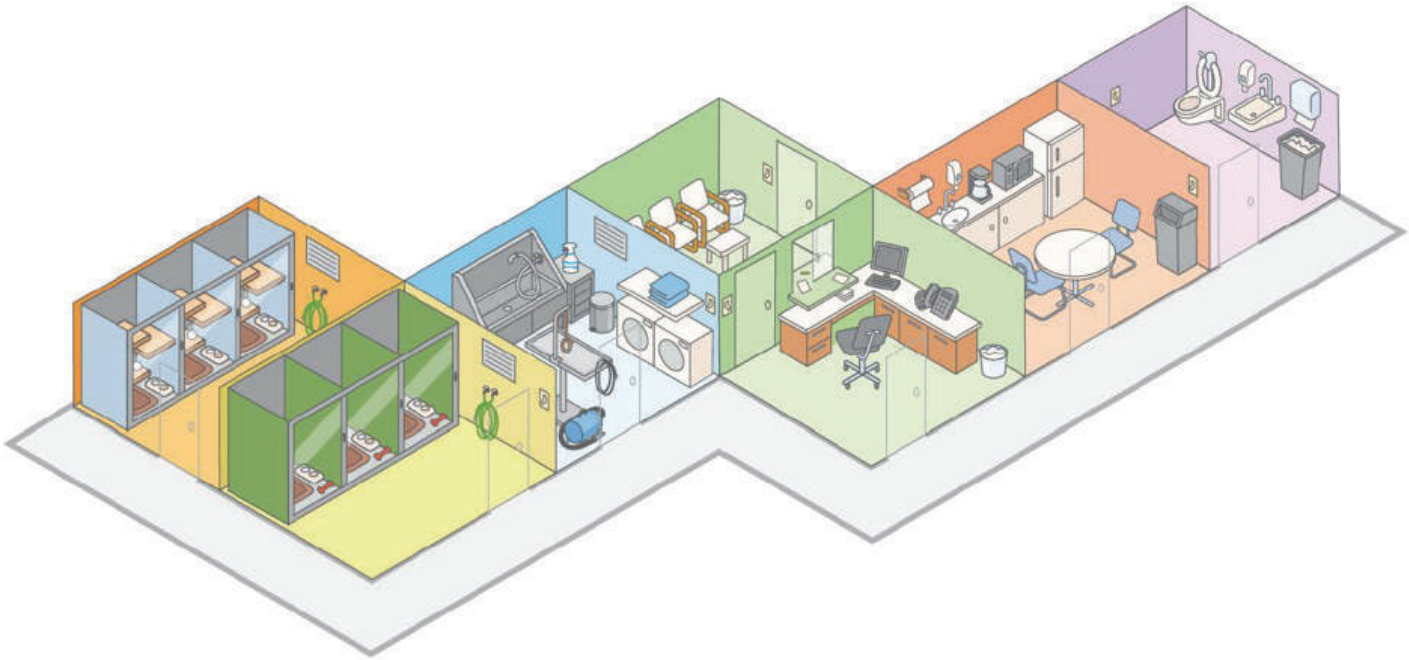
### Don't Forget Staff and Common Areas

Pathogens aren't just confined to treatment areas of your practice. Contaminated hands, equipment and surfaces can easily spread germs to other areas including waiting rooms, offices, restrooms and even breakrooms.

| Office/Waiting Area Hot Spots | Breakroom Hot Spots | Restroom Hot Spots |
|---|---|---|
| • Door handles<br>• Light switches<br>• Visitor chairs and tables<br>• Remotes<br>• Countertops<br>• Cabinets<br>• Desks<br>• Computer Keyboard and mouse<br>• Writing utensils | • Door handles<br>• Light switches<br>• Chairs<br>• Tabletops and Countertops<br>• Sink and Fixtures<br>• Hand Hygiene and Paper Towel Dispensers<br>• Refrigerator doors and handle<br>• Microwave doors and handle | • Door handles<br>• Light switches<br>• Sink<br>• Sink fixtures<br>• Grab bars<br>• Soap and paper towel dispensers<br>• Countertops<br>• Bathroom tissue holder<br>• Toilet seat, tank, bowl, handles |

# Element 3 - III: Monitor Compliance

## For Pet Boarding and Grooming – Cleaning and Disinfection Checklist



### Cages/Kennels

Kennels and cages in boarding facilities should be cleaned and disinfected daily. Wear appropriate PPE. First remove all items. Sweep or vacuum surfaces to remove organic material such as pet hair. Clean from top to bottom to reduce the risk of cross-contamination. First clean surfaces to remove all visible soil, then disinfect all surfaces. Rinse and dry. Replace clean and disinfected items.

- Ceiling
- Walls
- Doors
- Floors
- Food and Water bowls
- Toys
- Bedding (launder regularly)

**Laundry Best Practices:** Clothing and pet bedding should be washed using a hot cycle with bleach and detergent and dried in a hot dryer.[23]

## Element 3 - III: Monitor Compliance

### Grooming Areas

Clean and disinfect items that come into contact with pets, or with water used to wash pets. Have a schedule for cleaning and disinfecting after each pet, and on a regular basis.

| In between animals | Activity |
|---|---|
| Tables/countertops | • Remove all organic debris<br>• Clean and disinfect |
| Tubs | • Rinse, remove any debris, apply disinfectant, then rinse off |
| Equipment | • Clean off organic debris, soak in a disinfecting solution, then rinse and dry<br>• Wash tethers and leads |
| Kennel areas, crates | • Clean and disinfect wearing appropriate PPE |
| Floors and walls | • Remove organic debris<br>• Clean and disinfect |

| Weekly/Monthly | Activity |
|---|---|
| Kennel areas, crates | • Deep clean and disinfect |
| Storage areas, shelving | • Dust, clean and disinfect |

# Element 3 - III: Monitor Compliance

### Don't Forget Staff and Common Areas

Pathogens aren't just confined to treatment areas of your practice. Contaminated hands, equipment and surfaces can easily spread germs to other areas including waiting rooms, offices, restrooms and even breakrooms.

| Office/Waiting Area Hot Spots | Breakroom Hot Spots | Restroom Hot Spots |
|---|---|---|
| • Door handles<br>• Light switches<br>• Visitor chairs and tables<br>• Remotes<br>• Countertops<br>• Cabinets<br>• Desks<br>• Computer Keyboard and mouse<br>• Writing utensils | • Door handles<br>• Light switches<br>• Chairs<br>• Tabletops and Countertops<br>• Sink and Fixtures<br>• Hand Hygiene and Paper Towel Dispensers<br>• Refrigerator doors and handle<br>• Microwave doors and handle | • Door handles<br>• Light switches<br>• Sink<br>• Sink fixtures<br>• Grab bars<br>• Soap and paper towel dispensers<br>• Countertops<br>• Bathroom tissue holder<br>• Toilet seat, tank, bowl, handles |



# Elements of an effective environmental infection prevention program

## Glossary

| Term | Definition |
|---|---|
| **AVMA** | American Veterinary Medical Association. |
| **Bacteria** | Microscopic single-celled organisms (also called microorganisms) that inhabit virtually all environments, including soil, water, organic matter, and the bodies of animals. Most bacteria are harmless, but some have the capability to cause infections in animals and humans. (Singular - bacterium; plural – bacteria). |
| **Bleach** | A chemical that that can kill or inactivate microorganisms such as bacteria, viruses and fungi. Bleach is the common name for sodium hypochlorite although other oxidative chemistries like hydrogen peroxide can also be considered bleaches. A common ingredient in disinfectants used on surfaces. |
| **Blood** | The red body fluid that contains white and red blood cells, as well as platelets and proteins. This is considered an organic substance and is considered a soil that would need to be removed via cleaning prior to disinfecting a surface. |
| **Bloodborne pathogens** | Harmful microorganisms that are present in blood and can cause diseases. These pathogens include but are not limited to human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV). |
| **Clean** | Manual or mechanical removal of organic and inorganic soil and debris from surfaces and equipment. Cleaning prepares items for safe handling and/or further decontamination. |
| **Contact time** | The amount of time that a disinfectant must remain wet on a surface to kill microorganisms. This is sometimes known as the "wet time" or "dwell time". Contact times may differ for specific organisms. The product label will list microorganisms that the disinfectant can inactivate and the contact time required. As it is not obvious what microorganisms may be contaminating a surface, the longest contact time should be used when disinfecting. |
| **Contamination** | The presence (or reasonably anticipated presence) of infectious or potentially infectious material such as microorganism, blood, fecal matter or other bodily fluids on a surface or item. |

| | |
|---|---|
| **Decontamination** | The use of physical or chemical means to remove, inactivate or destroy microorganisms on a surface or item to the point at which they are no longer capable of transmitting infections. It is also the process of rendering a contaminated surface or item safe for handling, use or disposal. |
| **Disinfect** | The act of destroying or inactivating microorganisms using specialized chemical agents or products, or methods and techniques. |
| **Disinfectant** | A substance or mixture of substances that is applied to inanimate (non-living) surfaces to destroy or irreversibly inactivate microorganisms. In the United States, disinfectants are regulated by the Environmental Protection Agency (EPA). |
| **Limited spectrum disinfectant** | EPA-registered disinfectant that is effective against only a specific group of organisms. (Gram-negative or Gram-positive bacteria). |
| **Broad spectrum disinfectant (general disinfectant)** | EPA-registered disinfectant that is effective against both Gram-negative and Gram-positive bacteria. These have a wide variety of uses in residential, commercial, and institutional sites. |
| **Hospital disinfectant (healthcare disinfectant)** | EPA-registered disinfectant that is effective against *Staphylococcus aureus* and *Pseudomonas aeruginosa* and often other pathogens. |
| **Dwell time** | The amount of time that a disinfectant must remain wet on a surface to kill or inactivate microorganisms (see Contact time). |
| **Environmental Protection Agency (EPA)** | The Environmental Protection Agency (EPA) is a government agency in the United States which regulates antimicrobial pesticides including surface disinfectants. |
| **Fungus** | Single or multi-celled spore-producing organisms that include molds and yeast and found in many environments. Many are harmless, but some have the capability to cause infections in humans and animals. |
| **Germicide** | A substance or mixtures of substances that kill a number of microorganisms (e.g., viruses, fungi and bacteria). |
| **High touch surfaces** | The surfaces in the environment that are most commonly touched. They are generally considered to be the highest risk surfaces for transmission of pathogens. Common high touch surfaces may include exam tables, food and water bowls, kennel walls and doors. They require special attention when cleaning and disinfecting. |
| **Hydrogen peroxide, $H_2O_2$** | A chemical composed of hydrogen and oxygen atoms. It can kill or inactivate microorganisms such as bacteria, viruses and fungi. A common ingredient in disinfectants. |
| **Hypochlorite ($OCl^-$)** | See sodium hypochlorite. |

| | |
|---|---|
| **Improved hydrogen peroxide** | Hydrogen peroxide blended with other ingredients to enhance antimicrobial activity, stability and cleaning performance. The term Accelerated Hydrogen Peroxide® is a registered trademark of Virox® Technologies Inc. |
| **Infectious agent** | A microorganism having the ability to cause disease. Also called pathogens, infectious agents include bacteria, virus, fungi and parasites. |
| **Kill claim** | Microorganism efficacy claim. This is an organism that a particular agent or disinfecting product claims to kill. In the United States, all kill claims for a product must be approved by the EPA following submission of microbiological data demonstrating efficacy against each microorganism claimed. |
| **Material safety data sheet (MSDS)** | See Safety Data Sheet (SDS). |
| **Mode of transmission** | The method of transfer by which a microorganism is carried or transferred/transmitted from one place to another. For instance, a microorganism may be transferred from a surface to the hands of a patient or healthcare worker when the surface is touched. Or, the hands of the healthcare worker may transfer microorganisms from one person to another when person-to-person contact is made. |
| **Non-porous surface** | A surface that does not allow a liquid to pass through. Many non-porous surfaces are hard surfaces. Examples include plastic surfaces commonly found in veterinary settings. |
| **Organic soil** | Matter that has come from living organisms such as plants, animals or microorganisms. Substances that are considered to be organic matter include hair, blood, feces, sweat and other bodily fluids. |
| **Occupational Safety and Health Administration (OSHA)** | The Occupational Safety and Health Administration (OSHA) is part of the United States Department of Labor. OSHA's mission is to assure safe and healthful working conditions by setting and enforcing standards and by providing training, outreach, education, and assistance. |
| **Pathogen** | A harmful microorganism that causes an infection or disease. Not all microorganisms are considered pathogens. |
| **Personal Protective Equipment (PPE)** | A variety of barrier equipment used alone or in combination to protect mucous membranes, skin and clothing from contact with infectious agents and cleaner or disinfectants (when required). PPE includes gloves, masks, respirators, goggles, eye shields, face shields, gowns, and footwear. |

| | |
|---|---|
| **Safety Data Sheet** | This is a document intended to provide workers and emergency personnel with procedures for working with substances in a safe manner. Includes information about a substance's toxicity, health effects, first aid, storage, disposal and spill procedure. The information specifically relates to the ingredients in the product. Previously called a Material Safety Data Sheet (MSDS). |
| **Sanitize** | Reduction of the number of bacterial contaminants to safe levels as judged by public health requirements. |
| **Sanitizer** | The EPA definition of a sanitizer is a product that is "Used to reduce, but not necessarily eliminate, microorganisms from the inanimate environment to levels considered safe as determined by public health codes or regulations." |
| **sodium hypochlorite, NaOCl** | Also known as bleach or hypochlorite, this is a chemical composed of sodium, chlorine and oxygen atoms. It can kill or inactivate microorganisms such as bacteria, viruses and fungi. It is a common disinfecting agent. |
| **Soil** | Organic or inorganic matter that may contaminate surfaces. It may include substances such as blood, fecal matter, other bodily fluids, food and drinks, residue and sweat. |
| **Spore** | A tough, dormant state that some bacteria can exist in. Spores are formed when conditions do not support bacterial growth but if conditions become favorable, the bacteria can become vegetative and start to grow and reproduce. *Clostridium difficile* is an example of a spore-forming bacterium. |
| **Virus** | This is a small infectious agent that replicates only inside the living cells of other organisms. They can infect all life forms including animals and plants. Can cause infections and diseases in humans and animals. |
| **Zoonotic infection** | This is an infection spread between animals and humans. |

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