APPENDICES

INFECTION CONTROL MANUAL
Appendix A

**ISOLATION**

**VETERINARY STANDARD PRECAUTIONS**

Guidelines, Procedures, Monitoring, Biosecurity and Tracking

**VETERINARY STANDARD PRECAUTIONS**

Guidelines, Procedures, Monitoring, Biosecurity and Tracking

- Any suspect animal will be identified immediately upon admission, the student/house officer/faculty member notified, and appropriate protocols followed to minimize exposure to healthy animals and, if applicable, personnel.

- If contagious potential is known ahead of presentation, bring patient into AHIC using alternate route (side hallway between Landscape room and AHIC administrative offices).

- Examples include animals with respiratory or gastrointestinal signs or with a history of exposure to a known infectious agent.

- Precautions should be practiced consistently – regardless of clinical presentation or presumed diagnosis – whenever there is potential for personnel exposure to infectious materials such as bodily fluids, feces, vomitus, exudates, or non-intact skin.

**VETERINARY STANDARD PRECAUTIONS**

Guidelines, Procedures, Monitoring, Biosecurity and Tracking

- Suspect animals should immediately be taken to Room a1511 (2nd choice is a1510) for obtaining of history and physical examination.
  - These exam rooms are located in an area with less traffic therefore providing less potential exposure to healthy client-owned animals and personnel.

- The objective of infection control involves elimination/isolation of the source, reduction of susceptible host(s), and/or interruption of transmission.

- Place quarantine signage (blue contaminated room sheets) on both exam room doors and follow directions for contacting LARAC for cleaning.

- If admitted, animal should be transported to isolation Room a1519

**VETERINARY STANDARD PRECAUTIONS**

Guidelines, Procedures, Monitoring, Biosecurity and Tracking

- Pathogen transmission routes
  - Contact
  - Ingestion
  - Cutaneous
  - Percutaneous
  - Mucous membrane exposure
    - Aerolization
    - Droplet
    - Inhalation
    - Mucous membrane exposure
  - Vector-borne
  - Primarily mosquitoes, fleas and ticks
Appendix A (continued)

**Veterinary Standard Precautions**

**Guidelines, Procedures, Monitoring, Biosafety and Tracking**

- Approximately 868 of 1,415 (61%) known human pathogens are zoonotic.
- Approximately 132 of 175 (75%) emerging disease affecting humans are zoonotic.
- The CDC and WHO have identified more than 50 zoonotic diseases of importance in the United States.

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**Veterinary Standard Precautions**

**Guidelines, Procedures, Monitoring, Biosafety and Tracking**

- **Personal Protective Actions & Equipment**
  - Hand Hygiene – the single most important measure to reduce the risk of disease transmission.
    - **Washing**
      - Wet hands under running water
      - Place soap in palm
      - Rub hands together vigorously to produce a lather
      - Scrub hands thoroughly for 60 seconds
      - Rinse soap off hands.
      - Dry hands with disposable towel.
      - Turn faucet off with disposable towel as a contact barrier.

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**Veterinary Standard Precautions**

**Guidelines, Procedures, Monitoring, Biosafety and Tracking**

- **Personal Protective Actions & Equipment**
  - Hand Hygiene – the single most important measure to reduce the risk of disease transmission.
    - **Other considerations**
      - Nails should be kept short (~ ¼ inch).
      - Reduce or eliminate wearing of rings.
      - Alcohol-based hand rubs
        - Must contain 60-95% ethyl or isopropyl alcohol.
        - Apply after washing to clean hands and rub onto all surfaces until hands are dry.
        - Hand lotions should only be used when required and must contain an antimicrobial or sanitizing agent.

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**Veterinary Standard Precautions**

**Guidelines, Procedures, Monitoring, Biosafety and Tracking**

- **Personal Protective Actions & Equipment**
  - Hand Hygiene – the single most important measure to reduce the risk of disease transmission.
    - Gloves and sleeves – reduce risk of pathogen transmission by providing barrier protection
      - Gloves must be worn to accomplish all patient related tasks (examining/handling suspect animals, cleaning cages/cage boxes/ contaminated equipment, or when exposed to bodily fluids/feces/vomitus/exudates/contaminant skin exposure).
      - Remove gloves promptly after use and discard in biohazard bag.
      - Avoid contact with skin and wash hands.
      - Use a new pair of gloves each time.
Appendix A (continued)

**VETERINARY STANDARD PRECAUTIONS**
*Guidelines, Procedures, Monitoring, Biosecurity and Tracking*

- Personal Protective Actions & Equipment
  - Facial protection – prevents exposure of mucous membranes of the eyes, nose, and mouth
  - Respiratory tract protection – reduces or prevents infectious agent transmission via particle inhalation
  - Use of surgical masks with face shield or goggles accomplish these goals
  - For personnel that require wearing of eyeglasses:
    - Use tape over nose bridge to avoid fogging
    - Alternatively face shields or ventilated masks may be used

**Personal Protective Actions & Equipment**
- Protective outerwear
  - Gowns
  - Caps
  - Boots

  - Remove all loose articles of clothing, pens, stethoscopes before entering the isolation central clean anteroom
  - Set up a foot bath outside suite door prior to entering cage holding room
  - Don cap, mask, gowns, gloves, and bootie shoe covers in central clean isolation anteroom
  - Once treatment is complete, remove mask, caps, and gown and (if unsealed) hang on wall clips for future use with this case only. If sealed, the gown should be removed as per instructions on the following slide and discarded.
  - Dispose of booties and then gloves in biohazard bag.
  - Use foot bath after booties are removed but prior to reentering central clean anteroom

**Additional Isolation Procedures**
- Immediately upon placing a patient in isolation, change the sign on the outer anteroom door to OCCUPIED
- Individuals using isolation must log in and out in the Isolation Ward Log Book located in the isolation clean anteroom
- The number of people performing treatments in the isolation ward should be limited to the minimum required
- DO NOT place trash generated in isolation outside of the room. All trash should be placed in an appropriately labeled disposable bag (biohazard) and left in the room or submitted to the laboratory submission desk to be disposed of as medical waste. (Contact technician if uncertain how to submit medical waste.)
Appendix A (continued)

**VETERINARY STANDARD PRECAUTIONS**

**GUIDELINES, PROCEDURES, MONITORING, BIOSECURITY AND TRACKING**

- Additional Isolation Procedures (continued)
  - No equipment, instruments, drugs or supplies are to be taken from the isolation ward to any parts of the hospital. Stethoscopes and thermometers are provided in isolation. Equipment used in isolation will be properly cleaned and appropriately disinfected after each use. It is the responsibility of the clinical team attending the patient to maintain and clean the isolation ward and anteroom after each use according to established protocol. These protocols may be found in isolation, on the quick-glance poster in isolation or within the policies and procedures. A technician in the service area (ICU, SAIM, CVS) must approve the room after cleaning.

- Additional Isolation Procedures (continued)
  - Supplies are available in the isolation anteroom. If additional supplies are needed please notify a technician (ICU, SAIM, CVS) or the AHIC administration office.
  - Charges for all items used and procedures performed in isolation must be captured in the patient’s electronic medical record.
  - The “Hospitalization – Isolation” daily fee does not capture consumable supplies.
  - Utilization of disposable items should be attempted whenever possible (ex. litter pans, food/water bowls, etc.). If a non-disposable item must be used, selection of an easily cleaned, disinfected and sterilized product is preferred.

- Additional Isolation Procedures (continued)
  - Ensure ICU is aware of all patients placed in isolation and that the patient can be seen on remote monitor. Anyone (student, technician, doctor) entering isolation or a contaminated exam room must:
    - a. wear personal protective equipment (disposable garments such as gloves, gowns, caps, masks, and shoe covers) while in isolation and
    - b. disinfect shoes either in a foot bath or with disinfectant spray and
    - c. change into clean scrubs or clothes (Shower if needed)
    PRIOR to returning to ICU.

  - Use of similar prudence should be considered prior to returning to general clinical duty.

- Additional Isolation Procedures (continued)
  - After hours treatments are the responsibility of the medicine, surgery or CVS student on the case. Emergency students may perform treatments at the end of their shifts. If assistance is needed they will contact the student on the case. THE ICU STUDENT SHOULD NOT ASSIST IN TREATMENT OF CASES IN ISOLATION.
  - Use prudence and common sense regarding selection of patients that you come in contact with. (Example: Do not come in contact with susceptible young animals or those that may be immune compromised.)
Appendix A (continued)

VETERINARY STANDARD PRECAUTIONS
GUIDELINES, PROCEDURES, MONITORING, BIOSECURITY AND TRACKING

• Cleaning and Disinfection of Equipment and Surfaces
  - Cap, mask, gown, gloves, and shoe covers should be worn to reduce risk of personnel infection and exposure, as well as, to decrease spread of pathogens
  - Surfaces should be cleaned to remove gross contamination as organic matter decreases the effectiveness of most disinfectants
  - The isolation area must be cleaned completely to include: equipment, cages, food/water bowls, litter pans, walls, countertops, and floor mopping.
  - Clean and disinfect equipment according to manufacturers recommendations or established protocol.

VETERINARY STANDARD PRECAUTIONS
GUIDELINES, PROCEDURES, MONITORING, BIOSECURITY AND TRACKING

• Cleaning and Disinfection of Equipment and Surfaces
  - When cleaning, avoid aerosolization or generating dust that may contain pathogens
  - Cloth materials such as bedding or toys should be disposed of if at all possible. If not feasible, safe handling procedures should be followed until proper cleaning/disinfection occurs (standard laundry detergent with machine wash/dry)
  - Use of Environmental Protection Agency (EPA)-approved disinfectants should follow manufacturers' instructions regarding dilution and contact time. This information can be found on the disinfectant source or in the MSDS sheets in isolation.
  - Personnel should follow safe practices according to the product's Material Safety Data Sheet (MSDS)

The Antimicrobial Spectrum of Disinfectants

Characteristics of selected disinfectants

<table>
<thead>
<tr>
<th>Property</th>
<th>QACs</th>
<th>Phenolics</th>
<th>Iodophors</th>
<th>Peroxides</th>
<th>Aldehydes</th>
<th>Chelating Agents</th>
<th>Quaternary Ammonium Compounds</th>
</tr>
</thead>
</table>

DISCLAIMER:
The use of trade names does not in any way signify endorsement of a particular product.

For additional product names, please consult the most recent Compendium of Veterinary Products.

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www.cfsph.iastate.edu

FOR MORE INFORMATION, SEE THE 'DISINFECTION 101' DOCUMENT AT www.cfsph.iastate.edu
Appendix A (continued)

**VETERINARY STANDARD PRECAUTIONS**

GUIDELINES, PROCEDURES, MONITORING, BIOSECURITY AND TRACKING

• Sources

The Center for Food Safety and Public Health, Iowa State University. Available at [http://www.cfsph.iastate.edu/](http://www.cfsph.iastate.edu/)


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**BIOSECURITY**

The Importance of Integrating Biosecurity Into Daily Practice

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**BIOSECURITY**

Why should we be concerned about biosecurity?

• Zoonotic transmission
• Post 9/11 terrorist threats
• Sentinel Professional Biomedical Field
• Pathogenic transmission
• Workplace safety
• Others?

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**BIOSECURITY**

How can we mitigate disease transmission?

• Pathogen transmission routes
  • Contact
    • Ingestion
    • Cutaneous
    • Percutaneous
    • Mucous membrane exposure
  • Aerosol
    • Inhalation
  • Vector-borne
    • Primarily mosquitoes, fleas and ticks
Appendix A (continued)

**BIOSECURITY**

- How can we mitigate disease transmission?
  - NASPHV Compendium of Veterinary Standard Practices
  - JAVMA, Vol 237, No. 12, December 15, 2010
- Objectives
  - Raise awareness of zoonotic disease risk in veterinary medicine
  - Address infection control issues specific to veterinary practice
  - Provide practical, science-based infection control guidance
  - Provide a model infection control plan for use in individual veterinary facilities

**BIOSECURITY**

- Approximately 868 of 1,415 (61%) known human pathogens are zoonotic
- Approximately 153 of 175 (75%) emerging disease affecting humans are zoonotic
- The CDC and WHO have identified more than 50 zoonotic diseases of importance in the United States
- Approximately 8% of veterinarians report a major animal-related injury resulting in lost work time or hospitalization

**BIOSECURITY**

- Most common injuries increasing risk

**BIOSECURITY**

- Most common injuries increasing risk
  - Dog bites – 3%-18% become infected
Appendix A (continued)

**BIOSECURITY**

- Most common injuries increasing risk
  - Dog bites – 3%-18% become infected
  - Cat bites – 28%-80% become infected

- Needles/sticks

**BIOSECURITY**

- Most common injuries increasing risk
  - Dog bites – 3%-18% become infected
  - Cat bites – 28%-80% become infected
  - Cat scratches, kicks, and crush injuries

- Needles/sticks
  - 1995 survey of 701 DVMs
Appendix A (continued)

**BIOSECURITY**

- Most common injuries increasing risk
  - Dog bites – 3%-18% become infected
  - Cat bites – 28%-80% become infected
  - Cat scratches, kicks, and crush injuries
  - Needlesticks
    - 1995 survey of 701 DVMs
      - 27% accidental self-injection of Rabies vaccine

**BIOSECURITY**

- Odds and Ends...
  - Lab coats should be worn to protect your clothing from biohazards. They should be removed prior to leaving the building or entering areas other than the AHC (ex. cafeteria, library, etc.).
  - Surgical shoe covers should be removed after leaving the surgical suite and new clean covers utilized prior to entering a surgical suite.

**BIOSECURITY**

- Elimination of risk impossible so focus should be on minimizing risk

- How?
  - Personal Protective Equipment (PPE)
  - Actions
  - Others
    - Exposure avoidance
    - Engineering controls
    - Administrative controls
Appendix A (continued)

**BIOSECURITY**

- Odds and Ends…
  - **DO NOT** enter or exit the building wearing scrubs or lab coats. (See CVM Policy and Procedures)
  - Take proper precautions and steps to ensure no transmission into your home environment occurs.
  - If your physician suspects you contracted a zoonotic disease, please report to AHC administration office **AND** ask for a *definitive confirmation*.

**BIOSECURITY**

- Questions???
Appendix B

KEY PLAN

VETERINARY MEDICAL EDUCATION CENTER
FIRST FLOOR SECTION B
Appendix C

DO NOT USE
CONTAMINATED ROOM

SUSPECT: __________
LARAC CONTACTED: ________________
DATE---TIME: ______________________
REPORTED BY: ______________________
WHO/HOW CONTACTED: (Circle 2)
  Mike Basset 5-1370 / Email / Cell (662)617-2419
  Brenda Walker 5-5932 / Email
  Peggy Johnson 5-1171 / Email
LARAC CLEANED BY: ________________
### Appendix E

**Veterinary Standard Precautions**

**Guidelines, Procedures, Monitoring, Biosecurity and Tracking**

#### The Antimicrobial Spectrum of Disinfectants

<table>
<thead>
<tr>
<th>Disinfectant</th>
<th>Bacteria</th>
<th>Viruses</th>
<th>Fungi</th>
<th>Spores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most susceptible</td>
<td>Gram-positive cocci</td>
<td>Most viruses</td>
<td>Many fungi</td>
<td>Many spores</td>
</tr>
<tr>
<td>Most resistant</td>
<td>Gram-negative aerobes</td>
<td>Some viruses</td>
<td>Some fungi</td>
<td>Some spores</td>
</tr>
</tbody>
</table>

**Characteristics of Selected Disinfectants**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Alcohol</th>
<th>Acids</th>
<th>Iodine</th>
<th>Hypochlorites</th>
<th>Horine</th>
<th>Hydrogen Peroxide</th>
<th>Phenol</th>
<th>Quaternary Ammonium Compounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advantages</td>
<td>Quick action</td>
<td>Alkaline</td>
<td>Ozone</td>
<td>Strong oxidizer</td>
<td>Bacteria</td>
<td>Harmful to skin</td>
<td>Bacteria</td>
<td>Harmful to skin</td>
</tr>
<tr>
<td>Disadvantages</td>
<td>Odor</td>
<td>Corrosive</td>
<td>Toxic</td>
<td>Harmful to respiratory system</td>
<td>Corrosive</td>
<td>Corrosive</td>
<td>Corrosive</td>
<td>Corrosive</td>
</tr>
</tbody>
</table>

For more information, visit www.veterinaryhealth.org
Methods for Sterilizing and Disinfecting Patient-Care Items and Environmental Surfaces

<table>
<thead>
<tr>
<th>Process</th>
<th>Result</th>
<th>Method</th>
<th>Examples</th>
<th>Health-care application</th>
<th>Type of patient-care item</th>
<th>Environmental surfaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sterilization</td>
<td>Destroy all microorganisms, including bacterial spores</td>
<td>Heat-automated High-temperature</td>
<td>Steam, dry heat, saturated chemical vapors, ethylene oxide gas, plasma sterilization</td>
<td>Heat-resistant critical and semicritical</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low temperature</td>
<td>Ethylene oxide gas, plasma sterilization</td>
<td>Heat-sensitive critical and semicritical</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Liquid immersion*</td>
<td>Chemical sterilants, glutaraldehyde, hydrogen peroxide, hydrogen peroxide with peracetic acid, peracetic acid</td>
<td>Heat-sensitive critical and semicritical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-level disinfection</td>
<td>Destroys all microorganisms, but not necessarily high numbers of bacterial spores</td>
<td>Heat-automated Washer-disinfector</td>
<td>Wipes that fail to render visibly sterile</td>
<td>Heat-sensitive semicritical</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Intermediate-level disinfection</td>
<td>Destroys vegetative bacteria and the majority of fungi and viruses, inactivates Mycobacterium leprae, not necessarily capable of killing bacterial spores</td>
<td>Liquid contact</td>
<td>U.S. Environmental Protection Agency-registered hospital disinfectant with label claim of tuberculocidal activity and a label claim of a broad-spectrum activity (e.g., virucidal, fungicidal, and bacterial)</td>
<td>Noncritical with visible blood</td>
<td>Clinical contact surfaces, blood spills on household surfaces</td>
<td></td>
</tr>
<tr>
<td>Low-level disinfection</td>
<td>Destroys the majority of vegetative bacteria, certain fungi, and viruses, does not inactivate Mycobacterium leprae, other mycobacteria</td>
<td>Liquid contact</td>
<td>EPA-registered hospital disinfectant with label claim of a broad-spectrum activity, including a label claim of a broad-spectrum activity (e.g., virucidal, fungicidal, and bacterial)</td>
<td>Noncritical without visible blood</td>
<td>Clinical contact surfaces, blood spills on household surfaces</td>
<td></td>
</tr>
</tbody>
</table>

* EPA and the Food and Drug Administration (FDA) regulate chemical germicides used in healthcare settings. FDA regulates chemical sterilants used on critical and semicritical medical devices, and the EPA regulates general-use sterilants and chemical disinfectants used on noncritical surfaces. FDA also regulates medical devices, including sterilants. More information is available at 1) http://www.epa.gov/ops/1/hp/chemreg/index.htm, 2) http://www.fda.gov/OrthoIndex.html, and 3) http://www.fda.gov/OrthoIndex.html.

1 Continuous time is the single critical variable distinguishing the sterilization process from high-level disinfection. With FDA-cleared liquid chemical sterilants, FDA defines a high-level disinfection as a method used under the same conditions as sterilization except for a shorter immersion time (4-7).

2 The tuberculocidal claim, based on a bench test to measure mycobactericidal activity, is at least 99.99% (4-log) efficacy against Mycobacterium leprae. Because microorganisms have among the highest levels of resistance among vegetative bacteria, fungi, and viruses, any germicide with a label claim of a broad-spectrum activity (e.g., virucidal, fungicidal, and bacterial) is considered capable of inactivating a broad spectrum of pathogens, including much less resistant organisms, including bloodborne pathogens (e.g., HIV-1, hepatitis C virus [HCV], and HBV). It is this broad-spectrum capability, rather than the products specific potency against mycobacteria, that is the basis for protocols and regulations dictating use of broad-spectrum chemicals for surface disinfection.

3 Chlorine-based products that are EPA-registered are available commercially. In the absence of an EPA-registered chlorine-based product, a formulation of sodium hypochlorite (e.g., household bleach) is an inexpensive and effective intermediate-level germicide. Concentrations ranging from 500 ppm to 1000 ppm of chlorine (1000-2000 mg/L) with flow of water, or approximately 1 gal of water, are effective on environmental surfaces that came in contact with visible contamination. Appropriate personal protective equipment (e.g., gloves and gowns) should be worn when preparing hypochlorite solutions (2-4 ppm). Caution should be exercised, because chlorine solutions are corrosive to metals, especially aluminum.

** Gram-negative bacteria, such as Pseudomonas aeruginosa, Serratia marcescens, and Stenotrophomonas maltophilia.**
## Appendix G

### Common disinfectants used in veterinary medicine


<table>
<thead>
<tr>
<th>Class</th>
<th>Disinfectant</th>
<th>Application in veterinary medicine</th>
<th>Activity in organic material</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alcohols</strong></td>
<td>Lactic acid</td>
<td>Disinfectant for Foot and Mouth Disease Virus</td>
<td>Poor</td>
<td>Non-toxic and non-irritating at typical dilutions.</td>
</tr>
<tr>
<td></td>
<td>Ethanol, methanol,</td>
<td>Disinfectant for Foot and Mouth Disease Virus</td>
<td>Poor</td>
<td>Non-toxic and non-irritating at typical dilutions.</td>
</tr>
<tr>
<td></td>
<td>isopropanol</td>
<td>Carcass decontamination</td>
<td></td>
<td>Immediate bactericidal effect and delayed bacteriostatic effect results in extended shelf-life</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>of meat and decreased risk of food-borne pathogen transmission.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Surface disinfectant, topical antiseptic, hand sanitizing lotions.</td>
<td>Very poor</td>
<td>High concentrations for effective use in most situations as a germicide. Commercially available</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>hand sanitizing lotions have been shown to greatly reduce bacterial counts on skin. Also</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>effective against many viruses. Highly flammable.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Irritating to injured skin, but low toxicity.</td>
</tr>
<tr>
<td><strong>Aldehydes</strong></td>
<td>Formaldehyde</td>
<td>Surface disinfectant, fumigant</td>
<td>High</td>
<td>Highly irritating and toxic, both through contact and fumes. Exposure to formaldehyde vapor</td>
</tr>
<tr>
<td></td>
<td>Glutaraldehyde</td>
<td>Surface disinfection and sterilization</td>
<td>High</td>
<td>has associated carcinogen risk. Contact sensitization can develop rapidly. Active against</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>nonenveloped viruses, and gluteraldehyde is an effective sporicide with sufficient contact.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Non corrosive on metals, rubber, plastics, lenses, and cements. Glutaraldehyde is most active</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>at alkaline pH.</td>
</tr>
<tr>
<td><strong>Alkalis</strong></td>
<td>Sodium hydroxide</td>
<td>Environmental disinfection, surface disinfectant</td>
<td>High</td>
<td>Highly caustic. Strong concentrations can be used for prion disinfection.</td>
</tr>
<tr>
<td>(lye, soda lye)</td>
<td>Calcium hydroxide</td>
<td>Environmental disinfection</td>
<td>Moderate</td>
<td>Sometimes used as a whitewash that kills or inhibits growth of non-spore-forming bacteria.</td>
</tr>
<tr>
<td>(slaked lime)</td>
<td>Sodium carbonate</td>
<td>Cleansing agent</td>
<td>Moderate</td>
<td>Used extensively in Foot and Mouth Disease outbreaks.</td>
</tr>
<tr>
<td><strong>Biguanides</strong></td>
<td>Chlorhexidine</td>
<td>Surface disinfectant, topical antiseptic</td>
<td>Very poor</td>
<td>Very low toxicity potential. Typical dilutions are non-irritating even when contacting mucosa.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Inactivated by anionic detergents. Bactericidal activity on skin is more rapid than many other</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>compounds, including iodophors. Residual effect on skin diminishes regrowth.</td>
</tr>
<tr>
<td><strong>Chlorine</strong></td>
<td>Sodium hypochlorite</td>
<td>Surface disinfectant</td>
<td>Very poor</td>
<td>Bactericidal activity is reduced with increasing pH, lower temperatures, and in the presence</td>
</tr>
<tr>
<td>releasing</td>
<td>(Bleach)</td>
<td></td>
<td></td>
<td>of ammonia and nitrogen compounds which can be important when urine is present. Not affected</td>
</tr>
<tr>
<td>agents</td>
<td>Calcium hypochlorite</td>
<td>Surface disinfectant</td>
<td>Very poor</td>
<td>by water hardness. Considered to have relatively low toxic potential with standard dilutions.</td>
</tr>
<tr>
<td></td>
<td>Chlorine dioxide</td>
<td>Fumigant, gas sterilization</td>
<td>Moderate</td>
<td>Chlorine gas can be produced when mixed with other chemicals. Strong oxidizing (bleaching)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>activity that can damage fabric and is corrosive on metals, silver, and aluminum (not</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>stainless steel). Strong solutions can deactivate prion material. Chlorine dioxide is</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>irritating and toxic.</td>
</tr>
<tr>
<td>Class</td>
<td>Disinfectant</td>
<td>Application in veterinary medicine</td>
<td>Activity in organic material</td>
<td>Comments</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------------------</td>
<td>------------------------------------</td>
<td>-----------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Iodophors</td>
<td>Surface disinfectant, topical antiseptic</td>
<td>Very poor</td>
<td>Absorption of iodine and associated toxicity is greatest with tinctures and solutions, and reduced with iodophors. People can become sensitized to skin contact. Generally less active than chlorine releasing agents. Bacteriocidal activity is slowed at lower temperatures and alkaline pH, but affected less by organic material than chlorine releasing agents. Dilution of iodophors increases free iodine concentration and antimicrobial activity. Metal surfaces can be oxidized. Staining of tissues and plastics also occurs.</td>
<td></td>
</tr>
<tr>
<td>Peroxygens</td>
<td>Peroxymonosulfate</td>
<td>Surface disinfectant, fumigant</td>
<td>High</td>
<td>Low toxic potential and non-irritating. No harmful decomposition products.</td>
</tr>
<tr>
<td>Hydrogen peroxide</td>
<td>Surface disinfectant, topical antiseptic, gas sterilization</td>
<td>Low</td>
<td>Peroxymonosulfate is labeled for use against Foot and Mouth Disease Virus, and can be used in the presence of animals. Peracetic acid (PAA) may be a weak carcinogen. Hydrogen peroxide (HP) has brief germicidal activity when applied to tissues. Poor lipid solubility. Less active at low temperatures. Excellent against spores. PAA is germicidal at much lower concentrations than HP. Corrosive to plain steel, iron, copper, brass, bronze, and vinyl, and rubber.</td>
<td></td>
</tr>
<tr>
<td>Peracetic acid</td>
<td>Surface disinfectant, fumigant</td>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenols</td>
<td>Various phenols (2-phenylphenol, benzylphenol, 4-chloro-3,5-dimethylphenol, etc.)</td>
<td>High</td>
<td>Irritation is variable among compounds, but these compounds are in general highly irritating and should not be used on surfaces that contact skin or mucosa. Environmental safety is also variable. Not affected by hardness of water. Extended residual activity after drying. Active against non-enveloped viruses. Some residual activity after drying.</td>
<td></td>
</tr>
<tr>
<td>Quaternary</td>
<td>Various ammonium salts (mono-alkyltrimethyl ammonium salts, etc.)</td>
<td>Surface disinfectant</td>
<td>Moderate</td>
<td>Irritation and toxicity is variable among products, but these compounds are generally non irritating and have low toxicity at typical dilutions. Inactivated by anionic detergents. Some residual activity after drying. Good hard water tolerance, more effective at alkaline pH.</td>
</tr>
</tbody>
</table>