

***Clostridium difficile* Decontamination Guidelines Using PeridoxRTU[®] Sporicidal Disinfectant and Cleaner**

What is *Clostridium difficile*? The human digestive tract is home to approximately 1,000 species of microorganisms, most of which are either helpful or harmless under normal, healthy conditions. However, when something upsets the natural balance of these microbes, these otherwise harmless bacteria can proliferate and make people sick. Although rare when compared to other bacteria found in the human intestinal tract, *Clostridium difficile* (pronounced *klos-TRID-e-um dif-uh-SEEL*) can cause a serious condition known as ***Clostridium difficile* colitis**, which is caused by toxins produced by the bacteria that attack the lining of the intestines. *Clostridium difficile* is one of the leading causes of infectious diarrhea in the United States and infections can range from mild to life threatening. Those at greatest risk of *C. difficile* infection are hospital patients or long-term care facility patients who require extended treatments with antibiotics, which eventually kill off the weaker harmless bacteria and allow the more resistant, harmful strains like *C. difficile* to flourish. Others at risk are healthcare workers, those with weakened immune systems, and the elderly.

How are *C. difficile* infections spread? Although most *C. difficile* infections affect people who have been hospitalized or on antibiotics, it can be transmitted from one person to another through contact with articles or surfaces contaminated with the bacterial spores. *Clostridium difficile* colitis causes severe diarrhea and improper hygiene practices by both patient and hospital staff is usually the cause of surfaces, materials, or articles becoming contaminated and passed to others. The infection is typically spread through the fecal-oral route of entry into the body – touching a contaminated surface/article, followed by consuming food by the bare hand. The unsuspecting, infected person can carry the disease home or to work with them and the cycle begins all over again.

Antimicrobial products and *C. difficile*: Unlike some forms of bacteria that die off quickly when exposed to the environment, *C. difficile* spores can remain viable for months on contaminated surfaces and their resistance to traditional disinfectants requires the use of EPA registered disinfectants capable of killing spores. As of the writing of this guideline, there were twenty-four (24) products on the EPA's list of registered antimicrobial products effective against *Clostridium difficile* spores. Sixteen of the products listed contain varying percentages of bleach (sodium hypochlorite), which is considered corrosive to metals and unsuitable for use on many surfaces and materials due to its aggressive oxidizing nature which can cause damage or discoloration. ***PeridoxRTU[®] Sporicidal Disinfectant and Cleaner is on the EPA approved products list and provides users with a better safety profile than most bleach-based products. It has a fast 3-minute kill time for *C. difficile* spores on hard, non-porous surfaces when used in accordance with the product label.***

Decontamination guidelines and recommendations: This is a guideline for using PeridoxRTU Sporicidal Disinfectant and Cleaner in the cleaning and disinfecting of *Clostridium difficile* spore contamination in commercial, institutional, and residential environments. This guide may be superseded by local regulations. See PeridoxRTU EPA-approved product labels for additional information on use and application methods.

Personal Protective Equipment: PeridoxRTU Sporicidal Disinfectant and Cleaner has an excellent safety profile and Personal Protective Equipment (PPE) includes gloves and protective eyewear. When employees are working in an environment where they may be exposed to harmful pathogens or other potential health hazards, additional PPE may be required, such as those listed below:

- Disposable boot/shoe covers or rubber boots
- Tyvek suit or disposable gowns
- Eye protection: face shield, goggles, or face mask with eye protection
- Respiratory protection: N-95 mask or better

Recommended cleaning materials:

- Disposable cloths/wipes
- Scrub brushes and/or cleaning sponges
- Toilet brush
- Trash bags
- Duct tape for sealing waste bags
- Mops and buckets
- Portable carpet extractor (if needed, for cleaning carpets and upholstery)

Recommended chemical products:

- PeridoxRTU[®] Sporicidal Disinfectant and Cleaner – 32 oz. bottle
- Sporicidin[®] Enzyme Mold Stain Cleaner – 32 oz. bottle (makes 16 gallons of cleaner)

CLEANING AND DISINFECTING NON-POROUS SURFACES: All surfaces and materials that may have come into direct contact with the infected individual(s) should be cleaned and thoroughly disinfected using PeridoxRTU Sporicidal Disinfectant. The most economical and preferred method of applying PeridoxRTU is using disposable towelettes, wipes, or cloths. Particular attention should be paid to all common surfaces where the spores can easily be spread through direct contact with others. ***The use of a fogging device to apply PeridoxRTU Sporicidal Disinfectant is not recommended and is not currently approved as an application method by the U.S. EPA.***

Step 1 - Pre-clean: Surfaces to be disinfected should be clean and free from visible contamination. Gross contamination, such as fecal matter or other bodily fluids/waste, should be cleaned by scrubbing with a disposable wipe, towelettes, or cloth sprayed with PeridoxRTU Sporicidal Disinfectant and Cleaner. As an alternative, the gross filth can be cleaned using any quality detergent cleaner, such as Sporicidin Enzyme Mold Stain Cleaner, followed by rinsing with potable water and dried prior to disinfecting with PeridoxRTU.

Step 2 - Disinfection: Apply PeridoxRTU Sporicidal Disinfectant to pre-cleaned surfaces, ensuring the treated surface remains wet for at least three (3) minutes, followed by allowing the treated surface to air dry. Any remaining product can be removed with disposable towelettes, wipes, or cloth. Do not reuse soiled wipes or cloths. Cleaning technique should employ the top-to-bottom, back-to-front cleaning approach to minimize the spread of spores and cross-contaminating surfaces. Floors and bathrooms should be cleaned last.

Areas for special attention include:

- Tables, desks, chairs, headboards, night stands, bed rails
- Shower stalls, sinks, toilets
- Lockers, carts, storage bins, walls, floors, countertops, partitions, door knobs, handles, light switches
- Any other high-touch surfaces to be disinfected

Step 3 – Infectious Materials Disposal: Materials and supplies used in the cleaning and disinfection of *C. difficile* contamination that may contain fecal matter or human waste material should be bagged and sealed, then disposed of immediately in accordance with local regulations for infectious materials disposal.

CLEANING POROUS SURFACES AND MATERIALS: The U.S. EPA only allows antimicrobial products to make claim to disinfect carpets, rugs, fabrics, drapery, upholstery, and other porous materials with proper testing and approval. ***The use of PeridoxRTU Sporicidal Disinfectant on fabrics, carpet or other common textiles for cleaning and removal of C. difficile spores is not an EPA approved application method.***

These materials may, depending on the severity of the visible contamination, be cleaned in accordance with the manufacturers laundering/cleaning recommendations. However, there is no real guarantee that all the *Clostridium difficile* contamination will be completely removed and it may be more practical to replace the items or textiles than try to salvage them.

Synthetic carpets and textiles – Spot Cleaning Visibly Soiled Areas or Stains: Pre-treat any areas where visible fecal waste or staining is evident by lightly wetting the soiled area with diluted Sporicidin Enzyme Mold Stain Cleaner (ENZ-3212) or a general purpose, mildly alkaline liquid detergent cleaner and allow to remain wet for the time indicated on the label, followed by blotting clean with paper towels or disposable cloths or wipes. **Cleaning Using Carpet or Upholstery Cleaning Machine:** Carpets, rugs, fabrics, upholstery, and other textiles designed to be wet cleaned and extracted using carpet/upholstery cleaning machines should be cleaned following the textile and equipment manufacturer's recommended instructions. *Spot test for fabric compatibility or color bleeding prior to full application.*

Silk and wool materials – All wool or silk-containing fabrics or materials should be spot cleaned following the article label cleaning instructions or taken to a dry cleaner or laundry facility for professional cleaning.

Clothing, linens and other personal fabrics – Laundering contaminated clothing, linens, and personal articles can be effective at killing *C. difficile*. Items that can withstand bleach (sodium hypochlorite) should be laundered following the bleach label directions. Colored items that cannot be bleached, and can withstand higher wash temperatures, should be laundered on the hot water setting (160-180°F) using household laundry detergent. Refer to the article manufacturer label instructions to determine if the items can be laundered using the bleach or hot water method describe above. If not, the article/item should be discarded and replaced. All items should be disinfected after coming in contact with contaminated materials by spraying the hard, non-porous surfaces with PeridoxRTU Sporicidal Disinfectant and Cleaner, remain wet 3 minutes, and then air dry.

Decontamination of tools and equipment: All tools, equipment, and individual personal protective equipment used in the clean up of *C. difficile* contaminated areas should be cleaned and disinfected using PeridoxRTU Sporicidal Disinfectant and Cleaner prior to removal from the contaminated area. Refer to Steps 1-3 of Cleaning and Disinfecting Non-Porous Surfaces found above. All porous cleaning materials and supplies used in the cleaning process should be discarded and disposed as infectious materials. See Disposal of Infectious Waste section below for further details.

Disposal of infectious waste: Soiled cleaning materials, such as wipes, paper towels, cloths, sponges, and mop heads contaminated with fecal waste and other potentially infectious waste, should be placed in trash bags, sealed with duct tape, and discarded in accordance with local infectious waste disposal regulations.

These materials are provided free of charge for educational purposes only. Contec, Inc. makes no representations or warranties and assumes no liability regarding the accuracy, origin or completeness of the materials or for any act or omission flowing from them. Follow your organization's procedures for infection control, cleaning and disinfecting. Always read and follow disinfectant labels.

Fungicidal/Mold Killing	Contact Time
<i>Aspergillus niger</i> (hard surface)	1 min.
<i>Aspergillus niger</i> (porous surface)	10 min.
<i>Candida albicans</i> (hard surface)	1 min.
<i>Trichophyton mentagrophytes</i> (athlete's foot fungus) (hard surface)	1 min.
Sporicidal	Contact Time
<i>Clostridium difficile</i>	3 min.
Viricidal	Contact Time
Avian influenza virus A (H3N2)	2 min.
Human coronavirus	2 min.
Adenovirus, Type 2	2 min.
Avian influenza virus H5N1	2 min.
Herpes simplex virus, Type 1	2 min.
Herpes simplex virus, Type 2	2 min.
Human immunodeficiency virus, Type 1 (HIV-1)	2 min.
Influenza A virus (H1N1)	2 min.
Influenza virus, Type A	2 min.
Influenza virus, Type B	2 min.
Norovirus (F. calicivirus)	2 min.
Poliovirus, Type 1	2 min.
Reovirus	2 min.
Respiratory syncytial virus (RSV)	2 min.
Rhinovirus	2 min.
Rotavirus (Strain WA)	2 min.
Hepatitis B virus	2 min.
Tuberculocidal	Contact Time
<i>Mycobacterium bovis</i>	5 min.

Bactericidal	Contact Time
<i>Enterobacter aerogenes</i>	2 min.
<i>Listeria monocytogenes</i>	2 min.
<i>Pseudomonas aeruginosa</i>	2 min.
<i>Salmonella typhimurium</i>	2 min.
<i>Staphylococcus aureus</i>	2 min.
<i>Vibrio cholerae</i>	2 min.
<i>Salmonella enterica</i>	2 min.
<i>Acinetobacter baumannii</i>	2 min.
<i>Campylobacter jejuni</i>	2 min.
<i>E. coli</i> 0157:H7	2 min.
<i>E. coli</i> ESBL	2 min.
<i>Enterococcus faecalis</i> Vancomycin Resistant (VRE)	2 min.
<i>Enterococcus hirae</i>	2 min.
<i>Haemophilus influenzae</i>	2 min.
<i>Klebsiella pneumoniae</i>	2 min.
<i>Legionella pneumophila</i>	2 min.
<i>Proteus vulgaris</i>	2 min.
<i>Serratia marcescens</i>	2 min.
<i>Shigella sonnei</i>	2 min.
Methicillin Resistant - <i>Staphylococcus aureus</i> (MRSA)	2 min.
Community Acquired Methicillin Resistant - <i>Staphylococcus aureus</i> (CA-MRSA)	2 min.
<i>Streptococcus Pneumoniae</i> Penicillin Resistant - (PRSP)	2 min.
<i>Streptococcus pyogenes</i>	2 min.