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Infection Control Recommendations for
Clostridium difficile-Associated Disease in Health Care Facilities

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Clostridium difficile (*C. difficile*) is the major cause of antibiotic-associated diarrhea (AAD). *C. difficile*-associated disease (CDAD) usually affects elderly patients with other underlying diseases. The organism usually resides in the large intestine. A small proportion of the healthy adult population harbor *C. difficile*; however, normal flora usually keep it in check.

Exposure to broad spectrum antibiotics presents an increased risk for the development of CDAD. The most commonly used antimicrobial agents associated with CDAD are clindamycin, cephalosporins, ampicillin/amoxicillin and fluoroquinolones. The overuse of these antibiotics contributes to the increased incidence of *C. difficile* illness. Studies investigating *C. difficile* clinical infections reported significant changes in incidence or prevalence as a result of antibiotic practice interventions (Lautenbach, E., MD., n.d.).

Degrees of gastrointestinal involvement with *C. difficile* may range from asymptomatic colonization, to mild to severe watery diarrhea, to life-threatening disease, including perforation of the colon and death. McDonald states that *C. difficile may be emerging in a new strain with increased virulence, antimicrobial resistance or both.*

In its spore form, *C. difficile* can withstand drying and heat, and is resistant to many disinfectants. The spores can survive up to five months in the environment. *C. difficile* has been cultured in rooms of infected individuals up to 40 days post discharge. (Patient Safety Advisory, Pennsylvania Patient Safety Reporting Systems, June 2005)

Epidemiology

Agent

C. difficile is an anaerobic, spore-forming, Gram-positive bacillus that produces at least two toxins: toxin A and toxin B.

Reservoir

Human

Mode of Transmission

C. difficile is shed in feces. Any surface, device or material that becomes contaminated with feces may serve as a reservoir for *C. difficile* spores. *C. difficile* spores are transferred to patients mainly via the hands of health care personnel who have touched a contaminated surface or item (CDC Fact Sheet - Information for Health Care Providers).

Infection Control

Standard Precautions

Standard Precautions are the foundation of all infection control practices to prevent transmission of infectious agents associated with health care. The major features of Universal Precautions and Body Substance Isolation, as well as other infection control practices, are included in Standard Precautions. Consistent use of these precautions offers the greatest potential for preventing transmission of organisms. These precautions are used even when walking into an "unknown situation" and are designed to protect health care workers and patients from contact with infectious agents. Hand hygiene is the single most important measure that can be used to reduce the risk of transmitting organisms from

one person to another or from one site to another on the same person or patient, and is an essential component of Standard Precautions. Hand washing, and **not** the use of alcohol based hand rubs, is recommended for use in the presence of *C. difficile*. (APIC Text of Infection Control and Epidemiology, 2005).

Transmission-Based Precautions

In addition to Standard Precautions, Contact Precautions are recommended. Upon entering the room of a patient infected with *C. difficile*, a gown and gloves should be worn. Demonstrated environmental contamination with *C. difficile* does occur (APIC Text of Infection Control and Epidemiology, 2005).

Hand Hygiene

Even though isolation practices and hand washing products have changed since the infection control profession began in the early 1970s, the message that “hand washing is the single most important measure to prevent the transmission of infection” has remained the same.

The Ontario Best Practice Manual for Prevention and Control of Transmission of *C. difficile* within Health Care Facilities (December 2004) states: “after removal and appropriate discarding of PPE (gloves and gown), hands should immediately be washed with soap and water for at least 15 seconds.” The Ontario Best Practice Manual further states that “the purpose of hand hygiene is to physically remove *C. difficile* spores through friction, lather and rinsing.”

This message is reinforced in the Guideline for Hand Hygiene in Health Care Settings Recommendations of the Health Care Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force (October 25, 2002) which states:

“none of the agents (including alcohols, chlorhexidine, hexachlorophene, iodophors, para-chloro-meta-xyleneol [PCMX], and triclosan) used in antiseptic hand wash or hand rub preparations are reliably sporicidal against *Clostridium* spp. or *Bacillus* spp.”

Hand Hygiene Technique

It is recommended that after glove removal, hand washing be accomplished using antimicrobial or non-antimicrobial soap and water, working up a bubbly lather with 15 seconds of vigorous friction, followed by a rinse with flowing water. The caregiver should be careful not to allow recontamination prior to leaving the patient’s room.

- Wet hands with water
- Apply soap to hands
- Rub hands vigorously together for at least 15 seconds
- Cover all surfaces of hands and fingers
- Rinse hands well to remove soap residue
- Dry with a paper towel
- Use towel to turn off the faucet.

Patient Placement

Patients with *C. difficile* diarrhea are to be placed in Contact Isolation until their diarrhea has resolved. The use of private rooms or cohorting of patients with CDAD, in addition to the use of Contact Precautions has been successful in limiting transmission of *C. difficile* in hospitals (Gerding, D., MD; Johnson, S., MD; Peterson, L., MD; Mulligan, M., MD; Silva, J., MD, 1995).

Environmental Cleaning

In the Guidelines for Environmental Infection Control in Health Care Facilities (2003), the “recommended approach to environmental infection control with respect to *C. difficile* is meticulous cleaning followed by disinfection using hypochlorite-based germicides as appropriate.” The guidelines further state: “however, because no EPA-registered surface disinfectants with label claims for inactivation of *C. difficile* spores are available, the recommendation is based on the best available evidence from the scientific literature.”

Some investigators have recommended the use of a 1:10 dilution of 5.25% sodium hypochlorite (household bleach) and water for disinfection of rooms of patients with *C. difficile* when there is continued transmission. (Rutala WA, Weber EJ, 1998)

More recently, in William A. Rutala’s slide presentation (2005) at the International Association for Professionals in Infection Control and Epidemiology (APIC) Symposium in Baltimore, Maryland, he stated that: “handwashing, barrier precautions and meticulous environmental cleaning with an EPA-registered disinfectant should be effective in preventing the spread of the organism (*C. difficile*).” Additionally, he states “in units with high endemic *C. difficile* infection rates or in an outbreak setting, use dilute solutions of 5.25-6.15 % sodium hypochlorite (e.g., 1:10 dilution of bleach) for routine disinfection.”

In light of the controversy over the appropriate disinfectant to use, it would seem prudent, at least, to use a 1:10 dilution of 5.25% sodium hypochlorite (household bleach) and water for the areas most heavily contaminated (high touch items: bedrails, call bell, telephone, overbed table, bathroom doorknob, water faucets, etc.).

Dedicated Equipment

“When possible, dedicate the use of non-critical patient care equipment to a single patient (or cohort of patients infected or colonized with the pathogen requiring precautions) to avoid sharing between patients”. “If use of common equipment or items is unavoidable,

then adequately clean and disinfect items before use for another patient.” (Centers for Disease Control and Prevention Guidelines for Hospital Infection Control).

If rectal temperatures are obtained, only disposable thermometers should be used with CDAD patients (Lautenbach, E, MD., n. d.).

Antimicrobial Treatment Protocol

Consider instituting a facility-wide treatment protocol, when clinically appropriate.

Oral metronidazole is considered the treatment of choice for CDAD. Oral vancomycin should be reserved for therapy only if there has been a failure to respond to metronidazole, or if the patient cannot tolerate metronidazole (Gerding, et al. 1995).

Antibiotic treatment of asymptomatic patients excreting *C. difficile* is not recommended (Gerding, et al. 1995).

Antibiotic formulary restriction should focus on epidemiologically implicated antimicrobial agents, usually second- and third generation cephalosporins, clindamycin or fluoroquinolones, or a combination of the three.

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