

BEYOND DISINFECTION

A Primer on Emergent Pathogens for Environmental Services Professionals and Clinicians

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According to the U.S. Centers for Disease Control and Prevention (CDC), it is estimated that one out of every 25 hospitalized patients will contract a health-care-associated infection (HAI). Each year HAIs are a documented source of increased mortality and morbidity, significant costs for care delivery, and have a negative impact on the patient experience. HAIs are typically preventable through the implementation of recommended evidence-based practices. The CDC Healthcare Infection Control Practices Advisory Committee (HICPAC) has authored numerous guidelines and guidance statements that directly reduce the risk for transmission of HAIs such as multi-drug resistant organisms (MDROs) and other emergent pathogens such as Ebola Virus Disease.

Impact of Antimicrobial Resistance on the Health Care System and Patients

Today's environmental services professionals are caring for an environment for a far more acutely ill patient than ever before, and some of these acutely ill patients may be infected with antibiotic resistant bacteria. These bacteria are resistant to the stockpile of antimicrobial agents that are available to us today. According to the CDC, there are at least 2 million illnesses and 23,000 deaths in the U.S. annually due to these deadly microorganisms. These microorganisms can be found in all health care settings, both inpatient and outpatient care environments, and are particularly prevalent in long-term care settings where the residents are exposed routinely to antibiotics in some cases. The CDC is working aggressively with the Food and

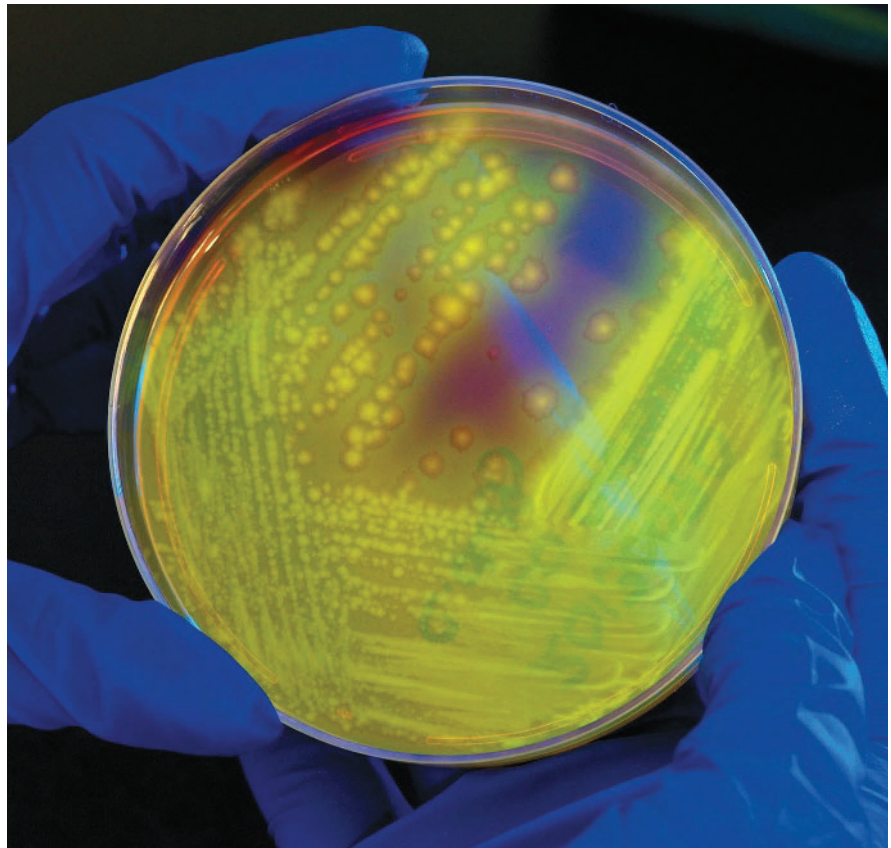


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This Petri dish culture had been inoculated with a *Clostridium difficile* bacterial culture. Over the past several years nationwide, states have reported increased rates of *C. difficile* infection, noting more severe disease and an associated increase in mortality. *C. difficile* infection remains a disease mostly associated with health care (at least 80 percent). Patients most at risk remain the elderly, especially those using antibiotics.

Drug Administration to address the drug pipeline for antibiotics, but environmental services professionals play an instrumental role in reducing the risk for development of these deadly pathogens by carefully collaborating with the patient's provider team and also clinical pharmacy personnel to determine the most appropriate treatment for the patient.¹

¹ National Strategy to Combat Antibiotic-Resistant Bacteria, electronically accessed from: www.cdc.gov/drugresistance/national-strategy on April 19, 2015, U.S. Centers for Disease control and Prevention.

A New Class of Deadly Emergent Microbes: CRE

CRE, which stands for carbapenem-resistant Enterobacteriaceae, are a family of germs that are difficult to treat because they have high levels of resistance to antibiotics. *Klebsiella* species and *Escherichia coli* (*E. coli*) are examples of Enterobacteriaceae, a normal part of the human gut bacteria that can become carbapenem-resistant. Types of CRE are sometimes known as KPC (*Klebsiella pneumoniae* carbapenemase) and NDM (New

Delhi Metallo-beta-lactamase). KPC and NDM are enzymes that break down carbapenems and make them ineffective. Both of these enzymes, as well as the enzyme VIM (Verona Integron-Mediated Metallo-β-lactamase) have also been reported in *Pseudomonas*. CRE has been the subject of news stories and outbreak investigations recently in the state of California due to an outbreak associated with duodenoscopes. Many CRE bacteria within the microbial class have been pan resistant to all known antibiotics, and others are quickly on a similar path for developing resistance. It is estimated that CRE microbes can contribute to death in up to 50 percent of patients who become infected. This leads unnecessary mortality and morbidity of the patients.²

Prevention Steps for CRE

- 1) Work with your medical laboratory and determine if patients with CRE are hospitalized within your facility. Closely monitor CRE infections for potential outbreaks and collaborate with your infection preventionist, infectious disease physician, environmental services professionals, and medical laboratory team to establish a system for monitoring for potential CRE outbreaks.
- 2) Place patients currently or previously colonized or infected with CRE on contact precautions immediately. Whenever possible, dedicate patient rooms, equipment, and staff to CRE patients to reduce the risk for potential transmission.
- 3) Wear an impervious gown and gloves when caring for patients with suspected or confirmed CRE.
- 4) Perform hand hygiene using an alcohol-based hand rub or wash hands with soap and water before and after contact with the patient or their environment.
- 5) Ensure the facility's medical laboratory immediately notifies the patient's provider and environmental services professionals when CRE is identified and confirmed.
- 6) Administer antibiotics only when clinically indicated.

² Carbapenem-resistant Enterobacteriaceae in Healthcare Settings, electronically accessed from: <http://www.cdc.gov/HAI/organisms/cre/index.html> on April 20, 2015, U.S. Centers for Disease Control and Prevention.

- 7) Discontinue devices such as urinary and rectal catheters as soon as they are no longer medically necessary.

Impact of *Clostridium difficile* Infection

A recent report released from the CDC has estimated that roughly 500,000 *C. difficile* infections occurred in the U.S. in 2011, of which 29,000 of those patients died as a complication of the infectious disease within 30 days of the initial diagnosis while hospitalized. Eighty-three thousand of the patients with infection experienced at least one recurrence within 30 days of the initial diagnosis. The major risk factor that contributes to the development of this disease is the overuse or inappropriate use of antibiotics. Antibiotics kill the natural, protective flora found in the patient's gut, which can then allow the *C. difficile* flora to overtake the bowel and result in infection. CDC studies have demonstrated that 30 to 50 percent of antibiotics prescribed in U.S. hospitals are unnecessary or clinically incorrect. *C. difficile* is a tremendous source of mortality and morbidity to the health care delivery system.³

Prevention Steps for *Clostridium difficile*⁴

- 1) Work with prescribers and the clinical pharmacist to ensure that antibiotics are indicated for the patient's condition, and carefully taken by the patient according to the prescribed directions. It is important to discontinue antibiotics as soon as they are not medically necessary.
- 2) Order a *C. difficile* test if the patient has had three or more unformed stools within a 24 hour time period.
- 3) Isolate patients with suspected or confirmed *C. difficile* disease immediately.
- 4) Follow isolation precaution guidelines when caring for patients with suspected or confirmed *C. difficile* (i.e., wearing gloves and a gown) even during short visits.

³ *Clostridium difficile* Infection, electronically accessed from www.cdc.gov/HAI/organisms/cdiff/Cdiff_infect.html on April 19, 2015, U.S. Centers for Disease Control and Prevention.

⁴ Recommendations for Clinicians for *Clostridium difficile*: What Healthcare Providers Can Do, electronically accessed from www.cdc.gov/HAI/organisms/cdiff/Cdiff_clinicians.html on April 17, 2015, U.S. Centers for Disease Control and Prevention.

- 5) Wash hands with soap and water to manually remove the spores from the hands. Alcohol-based hand rubs are not effective for removing spores from the hands.
- 6) Collaborate with the facility's environmental services professionals to ensure room surfaces are cleaned thoroughly on a daily basis and also upon discharge. It is important to use an EPA-approved, spore-killing disinfectant for units where there is potential transmission.

Emergent pathogens and antimicrobial resistance continue to plague the global health care system, however basic infection prevention and control practices can greatly assist environmental services professionals and the entire health care delivery team in reducing the risk for transmission of these pathogens. Maintaining a clean and sanitary environment, reducing the overuse of antibiotics, performing hand hygiene often, and keeping the patient's own skin intact will reduce the potential risk for transmission of many emergent pathogens such as CRE, Ebola Virus Disease, and *Clostridium difficile*.

In addition, environmental services professionals should carefully follow the evidence-based recommendations from the CDC for isolation precautions, use of personal protective equipment, disinfection and sterilization, and hand hygiene. These core recommendations will guide the clinical environmental services professionals, their teams, and other health care personnel in the adherence to well studies interventions that will significantly reduce the overall incidence of HAIs and also occupational exposure to the environmental services professionals. ●



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