

# DISCHARGE CLEANING TOOL KIT





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## The Burden of HAIs

Patient rooms and bathrooms can be high-risk areas for the spread of HAI-causing pathogens such as *Clostridium difficile* (*C. difficile*), methicillin-resistant *Staphylococcus aureus* (MRSA) and norovirus.

HAI-causing pathogens can remain on environmental surfaces for days, weeks and even months. If surfaces are left untreated, these pathogens can linger and continue to spread to others throughout a facility — putting patients and staff at risk for potentially dangerous infections.

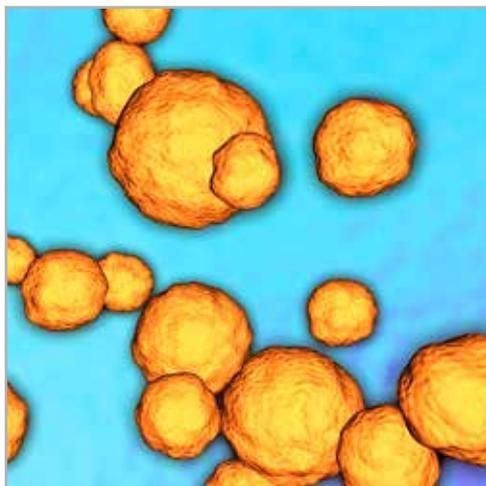
These infections can be deadly as well as costly:

On any given day, 1/25 of hospitalized patients have at least one healthcare-associated infection (HAI). This translates to over **720,000 HAIs in hospitals annually**. Approximately 1/9 of patients with HAIs died during the course of their hospital stay, roughly 75,000 patient deaths annually.<sup>1</sup>

A recent point prevalence study of HAI burden in the U.S. estimated **over 80,000 hospital-onset *C. difficile* infection cases in the U.S.** in 2011.<sup>1</sup> Almost all *C. difficile* infections (94 percent) are connected to healthcare and patient care facilities.<sup>2</sup>

**More than 80,000 people are infected with MRSA** in the U.S. each year and more than 11,000 die from the bacteria each year.<sup>3</sup>

**The five most common HAIs cost the U.S. healthcare system nearly \$10 billion per year**, and *C. difficile* infections alone accounted for 15.4 percent of total costs.<sup>4</sup>



1. Magill, S.S., Edwards, J.R., Stat. M., Bamberg, W., Beldavs, Z.G., Dumyati, G., Kainer, M.A., Lynfield, R., Maloney, M., McAllister-Hollod, L., Nadle, J., Ray, S.M., Thompson, D.L., Wilson, L.E., Fridkin, S.K. "Multistate Point-Prevalence Survey of Health Care-Associated Infections." *New England Journal of Medicine*. 370 (2014):1198-1208. Retrieved from: [http://www.nejm.org/doi/full/10.1056/NEJMoa1306801?query=featured\\_home#t=abstract](http://www.nejm.org/doi/full/10.1056/NEJMoa1306801?query=featured_home#t=abstract).

2. Centers for Disease Control and Prevention. "Making Health Care Safer: Stopping *C. difficile* Infections." *CDC Vital Signs Report*. March 2012. Retrieved from: <http://www.cdc.gov/VitalSigns/HAI/index.html>.

3. Contie, V. et al. "Stop the Spread of Superbugs: Help Fight Drug-Resistant Bacteria" *NIH News in Health*, February 2014. Retrieved from: <http://newsinhealth.nih.gov/issue/feb2014/feature1>

CDC site, content provider Lois S. Wiggs

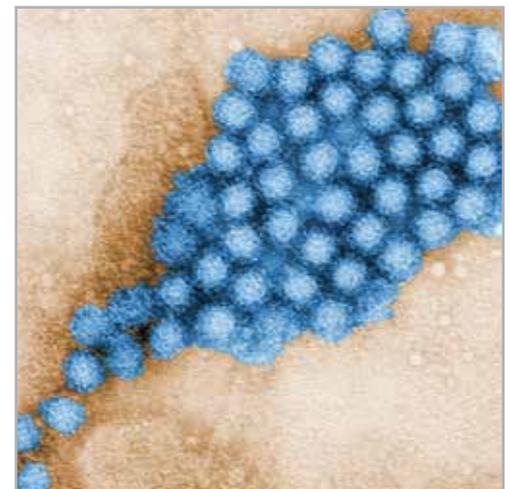
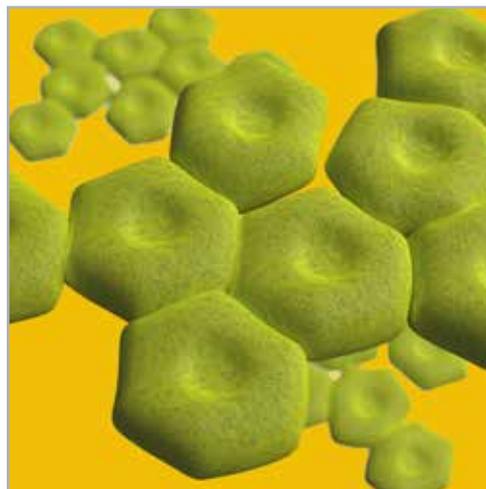
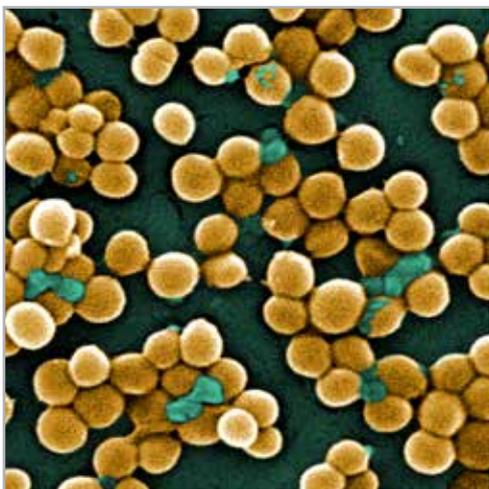
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## The Role of the Environment in Pathogen Transmission

In this environment, it's clear that discharge cleaning can play an important role in infection-prevention protocols. However, it is not always performed adequately in healthcare facilities. One study found that fewer than 50 percent of high-risk objects in hospital rooms were cleaned at patient discharge.<sup>5</sup>

Discharge cleaning and disinfection procedures were found lacking and in need of improvement in several other cases in which pathogens were present on surfaces following discharge of infected patients.<sup>6</sup> Improper use of disinfectants, such as failure to follow manufacturer recommendations for contact times, also impaired effectiveness. When performed correctly by trained, dedicated environmental services (EVS) staff, discharge cleaning can yield high-quality results and help prevent the spread of pathogens that cause infections.

With so many HAI-causing pathogens potentially present in healthcare environments, especially in patient rooms and bathrooms, and intensive care units (ICUs), it is important for infection preventionists and environmental services professionals to know about the sources of some of the most common HAIs and how they can help prevent their spread through a bundled approach to discharge cleaning.



4. Zimlichman, E et al. "Health Care-Associated Infections: A Meta-Analysis of Costs and Financial Impact on the US Health Care System." JAMA Internal Medicine 173.22 (2013): 2039-2046. Web.

5. Carling, P.C., Parry, M.M., Rupp, M.E., Po, J.L., Dick, B., Von Behren, S. "Improving cleaning of the environment surrounding patients in 36 acute care hospitals." Infection Control and Hospital Epidemiology. 29 (2008): 1035-1041.

6. Kramer, A., Schwebke, I., Kampf, G. "How long do nosocomial pathogens persist on inanimate surfaces? A systematic review." BMC Infectious Diseases. 6 (2006):130.

CDC site, content provider Janice Haney Carr and Jeff Hageman, M.H.S.; CDC site, content provider Charles D. Humphrey, PhD

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**Mary, a resident of a local long-term care facility,**

started experiencing symptoms of gastrointestinal illness, which led to her facility calling **911** to have Mary sent to the local community hospital.



Upon reaching the community hospital, Mary was admitted to the emergency department for treatment of severe diarrhea.



**While in the ED...**

Mary was treated by a nurse who, after meeting with Mary, touched several surfaces, including light switches, hand rails, point-of-care equipment, IV equipment.

After continuing to exhibit symptoms of severe diarrhea, Mary was transported from the emergency department to the facility's general med/surg unit for treatment. Her room was designated as a contact isolation room.



Airborne *C. diff* spores can be recovered in up to 25 cm above the toilet seat after flushing a contaminated toilet.<sup>7</sup>

**Potential spore transfer to future users of the same patient bathroom.**



**While in the Med/Surg Unit...**

✚ Mary used the patient restroom. The fecal plume coming from toilet post use led to spreading of spores across many different surfaces in the patient bathroom, including the sink, floor and toilet paper dispenser.

7. Best, E L, J A T Sandoe, and M H Wilcox. "Potential for Aerosolization of Clostridium Difficile after Flushing Toilets: The Role of Toilet Lids in Reducing Environmental Contamination Risk." The Journal of Hospital Infection 80.1 (2012): 1-5. Web.

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75% of *C. diff* infections begin outside of the hospital.<sup>2</sup>

*C. diff* can live on surfaces for up to 5 months.<sup>6</sup>



**!**  
Potential spore transfer to the next patient admitted to this station in the emergency department.

Up to 1 in 4 healthcare workers' hands are contaminated with *C. difficile* spores after caring for CDI patients.<sup>8</sup>

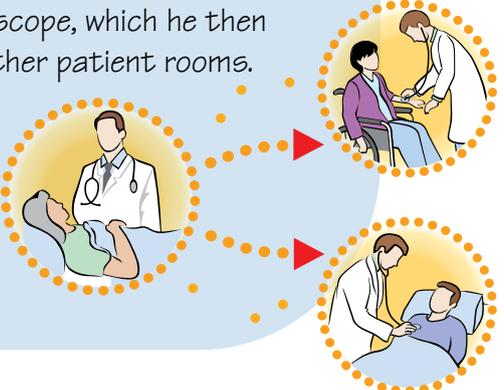
Only 50% of environmental surfaces in a typical patient room are effectively disinfected.<sup>5</sup>

**!**  
Possible spore transfer from isolation room to other patient rooms in the unit.

### How this hospital helped to prevent the spread of *C. diff*:

- When Mary left the ED, her treatment area was cleaned with an appropriate sporicidal agent.
- Upon discharge, the environmental services (EVS) team in the med/surg unit disinfected Mary's isolation room with a sporicidal agent. They followed a similar discharge-cleaning protocol even for non-isolation rooms in the same unit.

✚ A doctor evaluating Mary used a stethoscope, which he then wore in other patient rooms.



8. Landelle C, Verachten M, Legrand P, Girou E, Barbut F, Buisson CB. "Contamination of Healthcare Workers' Hands with Clostridium difficile Spores after Caring for Patients with *C. difficile* Infection." Infection Control and Hospital Epidemiology. 35.1 (2014): 1-10. Available from: <http://www.jstor.org/stable/10.1086/674396>.

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## Strategies for Effective Discharge Cleaning

*“Terminal, or discharge cleaning, is a reprocessing strategy for patient or resident care area, room or space that is implemented upon departure of the patient/occupant and is intended to render such room or space ready and safe for the next patient/occupant’s use.”<sup>9</sup>*



MINIMUM REQUIREMENTS FOR DISCHARGE/TERMINAL CLEANING	
✓	Cleaning and disinfection of high-touch surfaces (those touched by patients, healthcare staff and visitors)
✓	Cleaning environmental surfaces with visible soil and using evidence-based practice guidance
✓	Replacing patient care items



9. Association for the Healthcare Environment of the American Hospital Association. Practice Guidance for Healthcare Environmental Cleaning: the Essential Resource for Environmental Cleaning and Disinfection. 2nd ed. Chicago, IL, 2012.

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## Steps:

### 1. Gather Supplies

- Be alert for signage that may indicate the need for special precautions
- Proper cleaning and disinfectant products

### 2. Hand Hygiene + PPE

### 3. Remove Trash

### 4. Remove Soiled Linens

### 5. Clean Room (Horizontal and Vertical Surfaces)

- Dust — start with high surfaces
- Curtains, doors, recessed lights
- Walls
- Damp wipe all vertical surfaces
- Windows/glass
- Clean air vents and returns
- Inspect privacy curtains

### 6. Clean and Disinfect High-Touch Surfaces in Patient Room

- Headboard
- Bed rails
- Nurse call button and cord
- TV remote
- Handrails
- Bedframe
- Mattress
- Coated pillows
- Footboard
- Nightstand
- Over-the-bed table
- Mirrors
- Computers
- Telephones
- Arm chairs
- Cabinet handles
- Door knobs
- Light switches
- Patient equipment
- Blood pressure cuff and tubing
- Infusion poles
- IV pump control
- Multi-module monitor controls
- Multi-module monitor touch screen
- Multi-module monitor cables
- Ventilator control panel

### 7. Clean and Disinfect Bathrooms

- **Sink area** — counter, faucet and handles, sink basin, under the sink, all pipes with condensation, soap dispenser
- Grab bars
- Shower fixtures
- Shower floor
- **Toilet area** — toilet bowl, toilet seat, exterior, toilet handle
- Light switches
- Bathroom inner door knob and plate
- Bathroom light switch
- Toilet bedpan cleaner

### 8. Clean Floors — Room and Bathrooms

### 9. Prepare for the Next Patient: Replenish Patient Care Items and Exit

### 10. Disinfect with a UV Device, if Appropriate



## Pathogens of Top Concern

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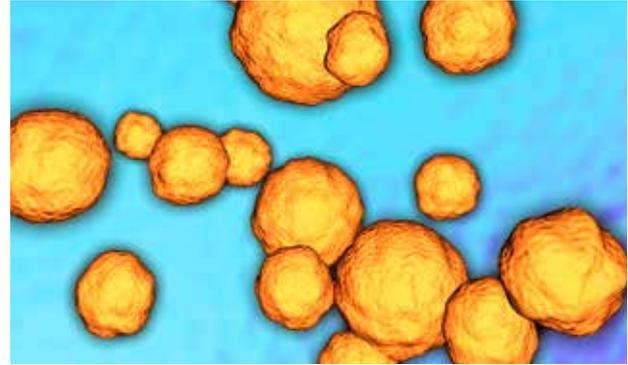


## *Clostridium difficile* (*C. difficile*)<sup>7</sup>

*C. difficile* is a bacteria found in the intestines that can cause diarrhea and more serious, life-threatening intestinal disease. [Recent news reports<sup>5</sup> link \*C. difficile\* to more than 30,000 deaths a year in the U.S.](#) Almost all infections of the bacteria (94 percent) are connected to healthcare and patient care facilities.<sup>6</sup> Patients using antibiotics or who experience gastrointestinal surgery, serious underlying illnesses, immune-compromising conditions or long stays in healthcare settings are at an increased risk of *C. difficile* infection.

### HOW IT SPREADS

- The bacteria is found in feces and is transmitted by hand to frequently touched environmental surfaces such as bedding, toilets, bedpans, light switches and grab bars.
- *C. difficile* can live on surfaces for weeks, even months.<sup>6</sup> Individuals can become infected if they come in contact with contaminated surfaces and then touch their mouths or mucous membranes.



## Methicillin-resistant *Staphylococcus aureus* (MRSA)<sup>8</sup>

Methicillin-resistant *Staphylococcus aureus* (MRSA) is a bacteria that is carried on the skin or in the noses of healthy people. It is resistant to treatment with commonly prescribed antibiotics such as methicillin, penicillin and amoxicillin. There are more than 80,000 cases of severe [MRSA infection in the U.S. each year, with more 11,000 people dying from the bacteria annually.](#)<sup>3</sup>

### HOW IT SPREADS

- MRSA can be transmitted from person to person through direct skin contact with shared items or via environmental surfaces that have been touched by an infected individual, e.g., equipment surfaces or towels.
- The bacteria can also be persistent on environmental surfaces, living on dry surfaces for days, weeks and up to months in some cases.<sup>10</sup> One study showed 64 percent of healthcare-associated MRSA hospitalizations occurred up to three months after discharge.<sup>11</sup>
- Healthcare-associated MRSA can cause surgical wound infections, bloodstream infections and pneumonia.

10. Centers for Disease Control and Prevention. "MRSA in Healthcare Settings." 16 Sept. 2013. Web. Accessed 25 Feb 2014. Retrieved from: <http://www.cdc.gov/mrsa/healthcare/>

11. Dantes, R., Mu, Y., Belflower, R., et al., National Burden of Invasive Methicillin-Resistant *Staphylococcus aureus* Infections, United States, 2011." *JAMA Internal Medicine* 173.21 (2013):1970-1978.

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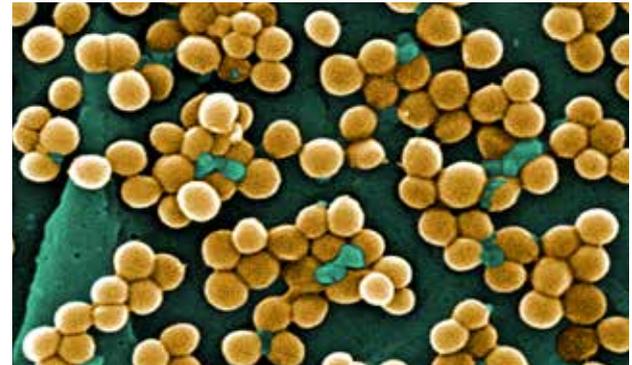


## *Klebsiella*<sup>12</sup>

*Klebsiella* is a Gram-negative, rod-shaped bacterium that is a member of the Enterobacteriaceae family and is commonly found in the human intestinal tract and human stool. In a recent CDC report of HAI prevalence in the U.S., *Klebsiella pneumoniae* and *Klebsiella oxytoca* were the third most reported causative pathogen, accounting for 9.9% of HAIs.<sup>1</sup>

### HOW IT SPREADS

- Enterobacteriaceae, including *Klebsiella*, can be spread in healthcare settings from person to person via the hands of healthcare workers.
- *Klebsiella* species can survive on inanimate surfaces from several hours to a month<sup>6</sup> and thus can spread via surfaces in the healthcare setting.



## Vancomycin-resistant enterococci (VRE)<sup>13</sup>

Enterococci are bacteria predominantly found in the digestive tract and/or female genital tract. Infection can lead to diseases in the urinary tract and bloodstream, and can cause endocarditis and meningitis. **VRE typically affect those who are already suffering from illness or another type of medical condition**, meaning hospitalized patients are particularly vulnerable.

### HOW IT SPREADS

- VRE are spread through direct, person-to-person contact and contaminated environmental surfaces.
- The bacteria can survive on surfaces for months<sup>6</sup>, and healthcare workers can transmit the bacteria after contact with a VRE patient if they do not properly clean their hands.

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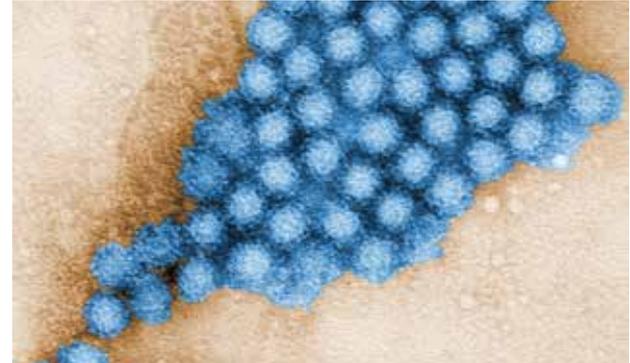


## *Acinetobacter baumannii*<sup>14</sup>

*Acinetobacter baumannii* is found on environmental surfaces, people's skin, and in soil, water, air and food sources. **There are at least 19 different strains of *Acinetobacter*, but *Acinetobacter baumannii* accounts for 80 percent of all reported infections.** Infections can occur in the skin, tissue, central nervous system, bone, respiratory tract, urinary tract and bloodstream, and cause nosocomial pneumonia as well as wound or blood infections.

### HOW IT SPREADS

- It can be transmitted via contaminated hands, environmental surfaces, ventilators, tubing and other medical equipment.
- The bacteria can survive on environmental surfaces for months.<sup>6</sup>



## Norovirus<sup>15</sup>

Norovirus is a single-stranded, nonenveloped RNA virus that is the most common cause of gastroenteritis in the U.S. The virus spreads quickly in enclosed spaces such as healthcare facilities and long-term care facilities. **Each year, an average of 800 deaths, 71,000 hospitalizations, 400,000 emergency department visits, 1.9 million outpatient visits, and 21 million total illnesses can be attributed to norovirus.**<sup>16</sup>

### HOW IT SPREADS

- Norovirus is spread by ingesting the virus most often through contaminated food or liquids, or by touching contaminated surfaces and then touching the mouth.
- It can also be spread through contact or sharing food with people infected with the virus or through contact with other objects.

12. Centers for Disease Control and Prevention. "Klebsiella pneumoniae in Healthcare Settings." 24 Nov. 2014. Web. Accessed 25 Feb 2014. Retrieved from: <http://www.cdc.gov/HAI/organisms/klebsiella/klebsiella.html>.

13. Centers for Disease Control and Prevention. "Vancomycin-resistant Enterococci (VRE) in Healthcare Settings." 10 May 2011. Web. Accessed: 25 Feb 2014. Retrieved from: <http://www.cdc.gov/hai/organisms/vre/vre.html>.

14. Centers for Disease Control and Prevention. "Acinetobacter in Healthcare Settings." 24 Nov. 2014. Web. Accessed 25 Feb 2014. Retrieved from: <http://www.cdc.gov/HAI/organisms/acetobacter.html>.

15. Centers for Disease Control and Prevention. "Prevent the Spread of Norovirus." 8 Jan 2014. Web. Accessed: 25 Feb 2014. Retrieved from: <http://www.cdc.gov/features/norovirus/>.

16. Hall, A., Lopman, B.A., Payne, D., Patel, M., Gastanaduy, P., Vinje, J., Parashar, U. "Norovirus disease in the United States." *Emerging Infectious Diseases*. 19.8 (2013).



## Hospital Study Summaries

## Patient and Environmental Service Employee Satisfaction of Using Germicidal Bleach Wipes for Patient Room Cleaning

### Scope:

- The “Wipe Out *C. difficile*” project was conducted by a multidisciplinary team at Mayo Clinic–associated hospitals in Rochester, Minn. The facilities switched from a quaternary ammonium–based cleaner to bleach wipes for daily and terminal cleaning of high-touch surfaces in all patient rooms in two patient care units with relatively high incidence of *Clostridium difficile* infection (CDI).
- The project goals included reducing healthcare-associated CDI rates and ensure that the cleaning process was well-tolerated by patients and employees.
- The results of the “Wipe Out *C. difficile*” project, as they relate to CDI rates, were published in another report.<sup>1</sup>
- This report focused on assessing patient and environmental services staff satisfaction with the switch to germicidal bleach wipes.

### Results:

- Patients continued to be very satisfied with how well their rooms were cleaned every day after the facility switched to bleach wipes. (Table 1)
- Bleach wipes were well-tolerated by patients surveyed on the medical units and less tolerated by patients on the hematology-oncology units.
- EVS staff (n=6) reported less satisfaction and more respiratory irritation from using the bleach wipes initially; however, later their satisfaction improved.

### Summary of Findings:

**The authors concluded that bleach wipes can be used for both daily and discharge cleaning without compromising patient or employee satisfaction.**

### Study Details:

- Study started August 2009 in medical patient care rooms and then was expanded to three hematology-oncology patient care units in 2010.
- The environmental services (EVS) team was trained to use bleach wipes containing 0.55% sodium hypochlorite for daily and terminal room cleaning for high-touch surfaces in all rooms in five patient care units.
- As the bleach wipe products were implemented, the team developed a script and additional measures to empower nursing and the EVS team to help address patient concerns about bleach odor.
- The authors used a convenience sample of hospitalized patients on the study units, and patient satisfaction was measured using a written questionnaire. The EVS staff was surveyed anonymously before and after implementation of the bleach wipe cleaning process.
- The authors noted that providing employee recognition was crucial to the success of the intervention.

**Table 1. Patient Survey Results**

	Location	
	Medical Ward	Hematology-Oncology
Patients who were “very satisfied” with room cleaning using quaternary ammonium product	90%	82%
Patients who were “very satisfied” with room cleaning using bleach wipes	89%	94%
Patients who noticed bleach odor	7%	50%
Patients who noticed bleach odor and found the bleach odor bothersome	0%	44%

Orenstein, Robert et al. “A Targeted Strategy to Wipe Out *Clostridium Difficile*.” *Infection Control and Hospital Epidemiology* 32.11 (2011): 1137-1139.

Aronhalt, KA; McManus, J; Orenstein, R; Faller, R; Link, M. *Journal for Healthcare Quality* 35.6 (2012): 30-36.  
Available: <http://onlinelibrary.wiley.com/doi/10.1111/j.1945-1474.2011.00202.x/abstract;jsessionid=5F0BAEDA823FABDE6FDCB9D05C03C993.f04t04>

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## Reducing *Clostridium difficile* Incidence, Colectomies and Mortality in the Hospital Setting: A Successful Multidisciplinary Approach

### Scope:

- The authors developed a hospital-wide multidisciplinary approach to control *Clostridium difficile* infections (CDIs) at Rhode Island Hospital, a 719-bed tertiary care hospital in Providence, R.I.
- The *C. difficile* hospital infection control plan (Table 1) engaged hospital administrators and hospital staff at all levels and involved six major interventions over a five-year period.
- The plan included infection control education for healthcare workers and environmental services (EVS) staff as well as enhanced daily and discharge cleaning of patient rooms.
  - Starting in Q3 2008, sodium hypochlorite-based cleaning agents, including Dispatch® disinfectant were used for daily and discharge cleaning for isolation rooms.
  - In Q3 2009, the facility expanded use of sodium hypochlorite-based products for discharge cleaning of all patient rooms.
  - The facility created an equipment cleaning index (Table 2) to assign cleaning and disinfection responsibilities. Cleaning frequency and cleaning product information was also included for each item.

### Results:

- 70.4% decrease in CDI rates. CDI rates decreased from a peak of 12.2/1,000 discharges (Q2 2006) to 3.6/1,000 discharges (Q3 2012).
- 63% decrease in CDI-associated mortality. Yearly mortality in patients with healthcare-associated CDI decreased from a peak of 52 in 2006 to 19 in 2011.

### Summary of Findings:

**The authors concluded, “We believe that a robust reduction is best afforded by interventions that involve education of staff regarding *C. difficile* infections and their impact on patient outcomes; more sensitive *C. difficile* detection methods of patient stool specimens; improved hand hygiene; compliance with contact precautions; reduced exposure to antimicrobial agents; and, particularly, improving decontamination of the environment in patient rooms, other care areas and patient care equipment.”**

### Study Details:

- The authors measured CDI rates using standardized case definitions and reported rates as CDI cases/1,000 hospital discharges.
- Primary and secondary *C. difficile* diagnosis data was used to measure the number of *C. difficile*-associated colectomies and the number of deaths in patients with *C. difficile* infection.
- Data was analyzed using a six-segment piecewise binomial regression to model changes in CDI rates over the course of the intervention implementation.
- The authors noted the following study limitations:
  - The study was completed at a single hospital (limited sample size) with no control group.
  - Compliance monitoring was not conducted for all interventions, and some interventions may have a lag phase, which could cause imprecise correlations between intervention strategy and CDI rates.
  - There was no independent assessment of CDI cases which could lead to ascertainment bias.

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**Table 1. Summary of *Clostridium difficile* Prevention Strategies**

Intervention	Timing	Key Elements
1. Develop <i>C. difficile</i> hospital infection control plan on the basis of a risk assessment	Q4 2007-ongoing	<ul style="list-style-type: none"> <li>Written plan development</li> <li>Frequent communication between hospital administrators and infection control committee</li> </ul>
2. Monitor morbidity and mortality associated with <i>C. difficile</i> infection	Q1 2008-ongoing	<ul style="list-style-type: none"> <li>Used standardized infection and mortality definitions</li> <li>Shared infection data with hospital administrators</li> </ul>
3. Improve sensitivity of <i>C. difficile</i> toxin detection in stool specimens using a polymerase chain reaction (PCR)-based assay	Q1 2010-ongoing	<ul style="list-style-type: none"> <li>Introduced faster, more sensitive testing method</li> <li>Changed nursing protocol to empower nurses to initiate contact precautions and order <i>C. difficile</i> toxin assay on patients with diarrhea</li> </ul>
4. Enhance environmental cleaning of patient rooms and equipment	Q2 2008-ongoing	<ul style="list-style-type: none"> <li>Surveyed hospital-staff to determine cleaning frequency for patient room items and equipment facilitywide</li> <li>Educated administrators on importance of environmental cleaning and disinfection in <i>C. difficile</i> prevention</li> <li>Hired more EVS workers to enable enhanced environmental cleaning and disinfection</li> <li>Monitored environmental cleaning compliance weekly utilizing fluorescent marker removal</li> </ul>
5. Develop a <i>C. difficile</i> infection treatment plan	Q1 2009-ongoing	<ul style="list-style-type: none"> <li>Recommended specific pharmacologic and surgical interventions</li> <li>Regular communication between surgeons, infectious disease specialists and pharmacists</li> </ul>
6. Conduct other interventions	Q3 2008-ongoing	<ul style="list-style-type: none"> <li>Patient bathing interventions</li> <li>Antibiotic stewardship efforts</li> <li>Monitored hospital-wide hand hygiene compliance</li> </ul>

**Table 2. Abbreviated equipment cleaning chart.**

Equipment	Location	Frequency	Responsibility	Daily Room Cleaning Product	Daily Isolation Room Cleaning Product	Discharge Room Cleaning Product	Monitoring
Bathroom	Patient Room	Daily and Discharge	EVS	Dimension 11 (quat-based disinfectant)	Dispatch Disinfectant	Dispatch Disinfectant	EVS
Commode	Patient Room	After use and between patients	Nursing	Disinfectant Wipes	Dispatch Disinfectant	Dispatch Disinfectant	Nursing
Beds	Patient Room	Daily and Discharge	EVS	Dimension 11	Dispatch Disinfectant	Dispatch Disinfectant	EVS
Bedside and overbed tables	Patient Room	Daily and Discharge	EVS	Dimension 11	Dispatch Disinfectant	Dispatch Disinfectant	EVS
Blood pressure cuffs in room	Patient Room	Daily and Discharge	Nursing	Dimension 11	Dispatch Disinfectant	Dispatch Disinfectant	Nursing
Trash	Patient Room	Daily and Discharge	EVS	Dimension 11	Dispatch Disinfectant	Dispatch Disinfectant	EVS
Hallway handrails	Unit	Daily	EVS	Dimension 11	Dispatch Disinfectant	N/A	EVS

The Burden of HAIs	The Role of the Environment in Pathogen Transmission	How <i>C. difficile</i> Can Spread	Strategies for Effective Discharge Cleaning	Pathogens of Top Concern	Study Summaries
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## Reduction of *Clostridium difficile* and vancomycin-resistant enterococcus contamination of environmental surfaces after an intervention to improve cleaning methods.

### Scope:

Authors conducted a before and after study at Louis Stokes Cleveland Veterans Affairs Medical Center, a 368-bed acute care medical facility in Cleveland, Ohio, to improve terminal cleaning and disinfection practices.

- The team evaluated how a bundled intervention strategy, including staff education, along with the use of a 1:10 bleach solution (DISPATCH®) for terminal cleaning of high-touch surfaces, could reduce microbial contamination on environmental surfaces.
- The study focused on rooms housing patients with *Clostridium difficile*-associated diarrhea (CDAD) or patients colonized or infected with vancomycin-resistant enterococcus (VRE).

### Results:

#### CDAD patient rooms

- During the evaluation phase, using 1:10 bleach solution (DISPATCH®) for disinfection of high-touch surfaces reduced *C. difficile* contamination of high-touch surfaces by 86% over baseline cleaning methods.
- After staff education and implementation of the bleach disinfection intervention, *C. difficile* contamination was reduced 78% and 1/9 CDAD patient rooms had *C. difficile* positive cultures.

#### VRE patient rooms

- During the evaluation phase using 1:10 bleach solution (DISPATCH®) for disinfection of high-touch surfaces reduced VRE contamination of high-touch surfaces by 100% over baseline cleaning methods.
- After staff education and implementation of the bleach disinfection intervention, VRE contamination was reduced 100% and 0/8 VRE patient rooms had VRE positive cultures.

### Summary of Findings:

**As a result of study, 1:10 bleach disinfection for high-touch surfaces was adopted for discharge cleaning of all patient rooms at facility**

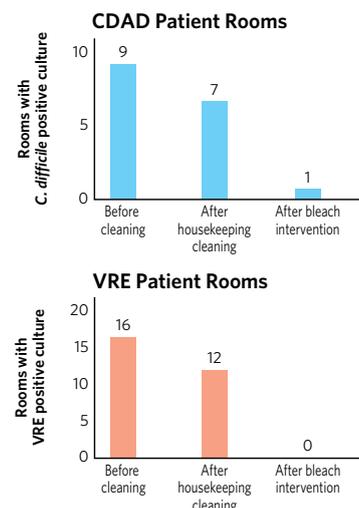
- EVS reported no surface damage or complaints due to use of bleach, despite initial concerns.
- The authors noted that staff education, regular feedback and monitoring of cleaning performance were key to the success of the intervention.

### Study Details:

The initial intervention took place over the course of six weeks. The progress of the intervention was monitored for 10 weeks after housekeeping staff received education and feedback. The authors also discussed limitations related to this study.

- The team used microbiology techniques to measure bacterial contamination of high-touch surfaces in each room at three different stages — before cleaning, after typical housekeeping cleaning, and after 1:10 bleach disinfection by the research staff.
- High-touch surfaces in each room included bedrails, telephones, call buttons, door knobs, toilet seats and bedside tables.

**Figure 1. Evaluation Phase Results**





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