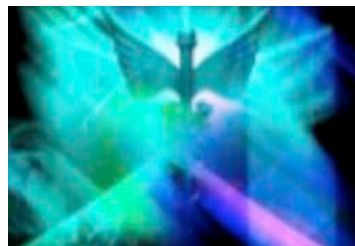




Infection Control Update for Nursing Homes

Survey and Certification Group
Centers for Medicare & Medicaid Services



Infection Prevention Update for Nursing Homes



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What we will cover...

- Environmental cleaning and C difficile Infection (CDI).
- Linen and Laundry processing
- HAI surveillance



***Clostridium difficile* (CDI) Infections Toolkit Activity C: ELC Prevention Collaboratives**

Carolyn Gould, MD MSCR

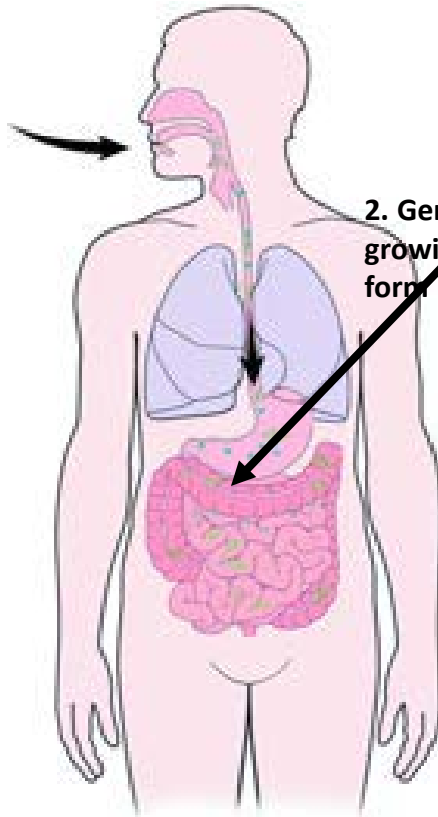
Cliff McDonald, MD, FACP

Division of Healthcare Quality Promotion
Centers for Disease Control and Prevention

Last reviewed - 2/29/12 --- Disclaimer: The findings and conclusions in this presentation are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Background: Pathogenesis of CDI

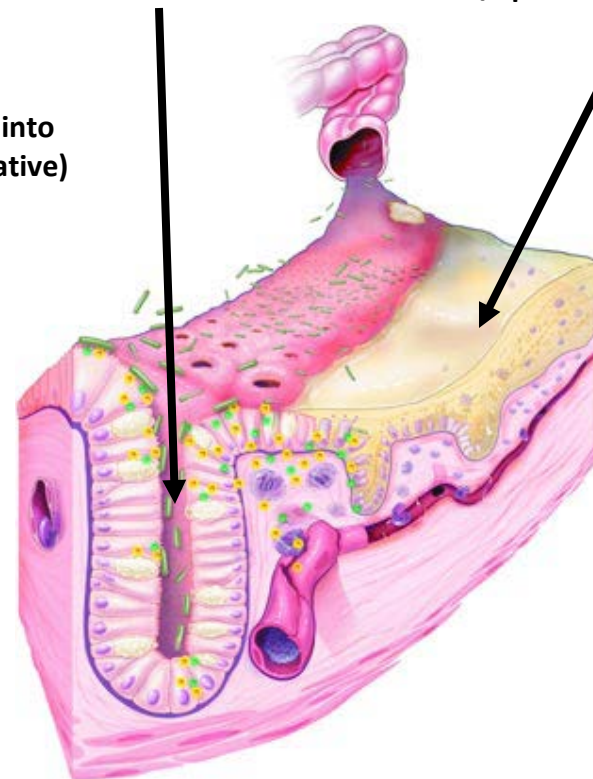
1. Ingestion of spores transmitted from other patients via the hands of healthcare personnel and environment



2. Germination into growing (vegetative) form

3. Altered lower intestine flora (due to antimicrobial use) allows proliferation of *C. difficile* in colon

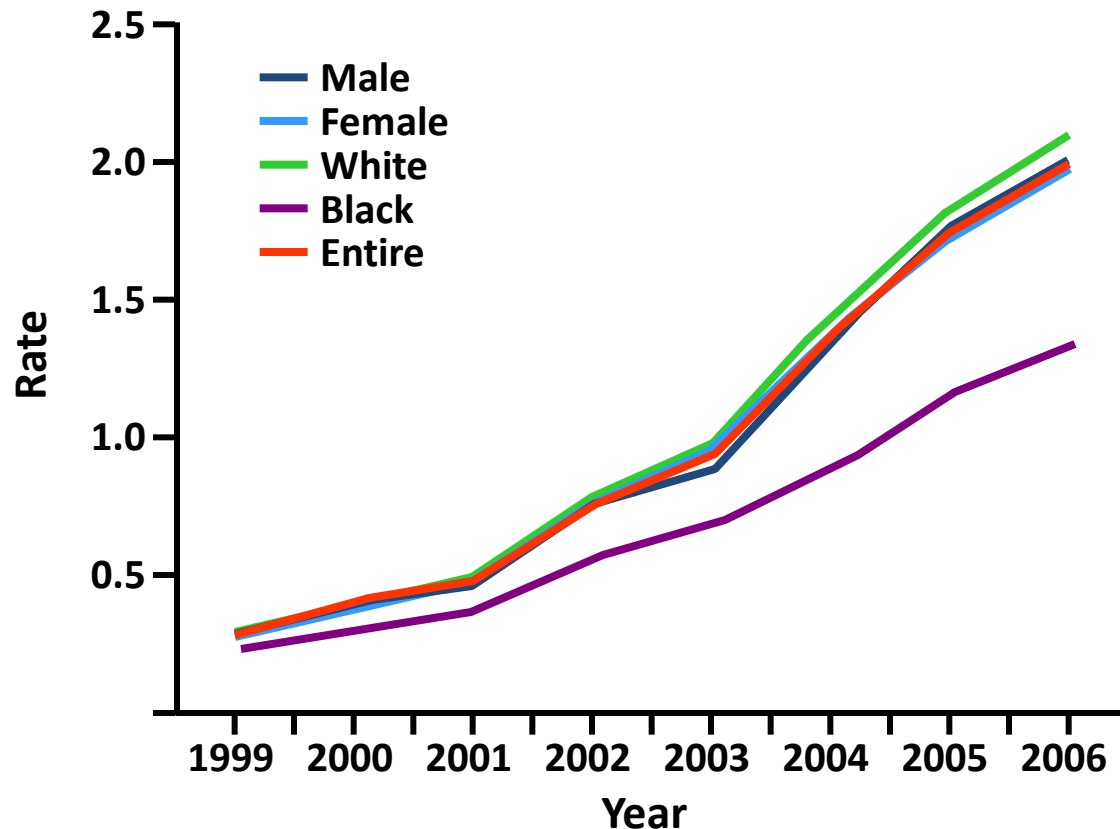
4. Toxin A & B Production leads to colon damage +/- pseudomembrane



Sunenshine et al. Cleve Clin J Med. 2006;73:187-97.

Background: Impact

Age-Adjusted Death Rate* for Enterocolitis Due to *C. difficile*, 1999–2006



*Per 100,000 US standard population

Heron et al. Natl Vital Stat Rep 2009;57(14).

Available at http://www.cdc.gov/nchs/data/nvsr/nvsr57/nvsr57_14.pdf

Prevention Strategies: Core

- Implement an antimicrobial stewardship program
- Contact Precautions for duration of diarrhea
- Hand hygiene in compliance with CDC/WHO
- **Cleaning and disinfection of equipment and environment**
- Laboratory-based alert system for immediate notification of positive test results
- Educate about CDI: HCP, housekeeping, administration, patients, families

http://www.cdc.gov/ncidod/dhqp/id_CdiffFAQ_HCP.html

Dubberke et al. Infect Control Hosp Epidemiol 2008;29:S81-92.

Prevention Strategies: Supplemental

- Extend use of Contact Precautions beyond duration of diarrhea (e.g., 48 hours)*
- Presumptive isolation for symptomatic patients pending confirmation of CDI
- Evaluate and optimize testing for CDI
- Implement soap and water for hand hygiene before exiting room of a patient with CDI
- Implement universal glove use on units with high CDI rates*
- **Use sodium hypochlorite (bleach) – containing agents for environmental cleaning**

* Not included in CDC/HICPAC 2007 Guideline for Isolation Precautions

CDC Guidelines for Environmental Infection Control in Health-Care Facilities, 2003

“Because no EPA-registered products are specific for inactivating *Clostridium difficile* spores, use hypochlorite-based products for disinfection of environmental surfaces in accordance with guidance from the scientific literature in those patient-care areas where surveillance and epidemiology **indicate ongoing transmission of C difficile.**”

New CDC Recommendations

March 2012

Use an EPA-approved spore-killing disinfectant in rooms where *C. difficile* patients are treated.



Surveillance Strategies for Infection Control in Nursing Homes

Surveillance is an important aspect of an infection control and prevention program.



Definition of Surveillance

Surveillance is a systematic method of collecting, consolidating, and analyzing data concerning the distribution and determinants of a given disease or event followed by dissemination of that information to those who can improve the outcome.



Definition of Infections

- Healthcare-associated infections – HAIs - (formerly known as nosocomial) are those that develop after admission to the Nursing Home.
- Community-acquired infections are those that are incubating at the time of admission or develop within 48 to 72 hours of admission or transfer from another facility.

Most Common HAIs in Nursing Homes

- Urinary tract infections (UTI's)
- Respiratory infections (influenza, pneumonia)
- Skin and soft tissue infections (infected pressure ulcers)
- Gastroenteritis
- Conjunctivitis



Infection Surveillance in Nursing Homes

CMS mandates Nursing Homes (NH) have a program to “investigate, control, and prevent infections”

Nursing Homes surveillance programs are widespread but problematic

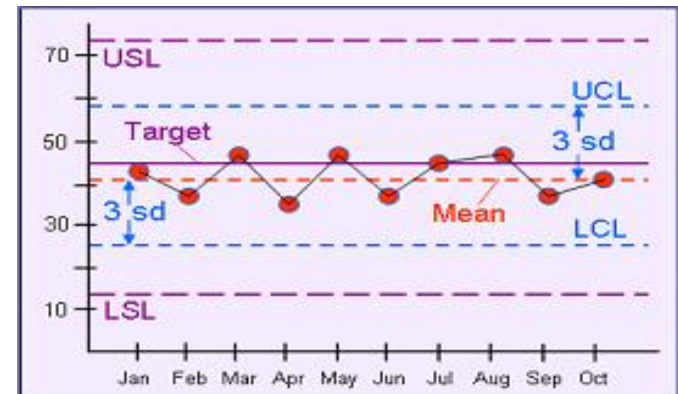
- No national system for collecting data (CDC-NHSN)
- No standard definitions
- No standard surveillance methods
- Accessibility of data limited
- Computer data management limited

But there is hope!

Elements of a Surveillance System in Nursing Homes

Each facility should develop a system for surveillance that includes:

- goals of surveillance program
- definitions of common infections
- surveillance procedure
- analysis of surveillance data to plan infection control efforts



Uses of Surveillance - *Why do surveillance?*

- Improvement of HAI rates
- Establishment of baseline data
- Identification of problem
- Provision of information to physicians, nursing staff and administration
- Establishment of priorities for infection control activities
- Evaluation of control measures, policies and procedures
- Education of healthcare personnel

Infection Criteria to Determine HAIs

- CDC definition of nosocomial infection (CDC, 1988)
- **Definitions of infections for surveillance in long-term care facilities. *AJIC*, vol 19, no 1, Feb 1991.**
- **Criteria for Defining Infections in LTC Facilities. *Inf Cont in LTCF Newsletter*, Summer 1996, pp 6-9.**

Approaches to HAI surveillance

Outcome-based

- Total (facility wide) surveillance
- Targeted or focused surveillance

Process-based

- Procedure related surveillance
- Environmental surveillance



Linen and Laundry Reprocessing

§483.65(c) Linens

Personnel must handle, store, process and transport linens so as to prevent the spread of infection.

If linen is sent off to a professional laundry, the facility should obtain an initial agreement between the laundry service and facility that stipulates the laundry will be hygienically clean and handled to prevent recontamination from dust and dirt during loading and transport.



Risk of Microbes by Laundering

- Soiled linens can be a potential source of pathogens
- Requires appropriate handling to lessen risk of cross-transmission
- Need to minimize risk of dermatitis from exposure to residual chemicals used in laundering



Linen and laundry

F441 IGs

“Detergent and water physically remove many microorganisms from the linen through dilution during the wash cycle. An effective way to destroy microorganisms in laundry items is through hot water washing at temperatures above 160°F (71°C) for 25 minutes.³³ Alternatively, low temperature washing at 71 to 77 degrees F (22-25 degrees C) plus a 125-part-per-million (ppm) chlorine bleach rinse has been found to be effective and comparable to high temperature wash cycles.”

Inactivation of Microbes by Laundering

- Laundering should achieve “hygienically clean” not sterile textiles.
- Antimicrobial action of laundering process is affected by physical and chemical factors
- Hot water (160°F for 25 minutes) is commonly recommended
- High-cost associated with maintaining hot-water washing (10-15% of energy consumed in hospitals, 1% of all energy in commercial sector)

Inactivation of Microbes by Laundering

- Rapid pH shift from approximately 12 to 5 also may inactivate microorganisms
- Drying and laundering provides additional significant microbicidal action
- No rationale for routine microbiological sampling of cleaned textiles and fabrics
- No microbiological standards for adequately laundered items.

History of Inactivation of Microbes by Laundering

High-temperature laundry practices

- In 1938, Arnold demonstrated exposure of laundry to $>71^{\circ}\text{C}$ (160F) (plus 1% bleach) for 25 min would kill nearly all bacterial forms (10^5 to 0/ml wash water)
- Study provided the basis for federal, AHA, CDC guidelines until 1980s



History of Inactivation of Microbes by Laundering

Blaser MJ et al, JID 1984;148:48

- Items contaminated with 10^6 and 10^8 CFU/100cm²
- Predominantly GNR 76.2%, GP organisms 23.8%
- Standard low-temperature washing cycle without laundry chemicals removed 3 log₁₀ of bacteria by agitation, dilution and drainage

History of Inactivation of Microbes by Laundering

Blaser et al, J Inf Dis 1984;149:48

- 3 \log_{10} of bacteria were killed after the bleach (125 ppm) was added
- Drying (107°C for 30 min) removed an additional 1-2 \log_{10} organisms
- Bacterial counts and species from low- and high-temperature fabrics were comparable
- Low-temperature washing is effective for eliminating bacteria

History of Inactivation of Microbes by Laundering

Christian et al, Appl Environ Microbiol 1983;45:591

- Low-temperature washing (48 to 77°C); wash included chlorine at 32 to 250 ppm.
- Initial maximum densities at least 5×10^5 CFU/cm².
- Washing process routinely produced fabric containing <1 CFU/cm²
- Low-temperature wash as effective as high-temperature



Inactivation of Microbes by Low Temperature Laundering

Effectiveness of low and moderate temperature wash on VRE removal

- VRE (10^7) contaminated sheets and towels
- Normal wash cycle with detergent used, varying load amounts
- 10-100 VRE survived on fabrics
- No VRE survival after second wash or chlorine rinse



NEW

Low Temperature Washing

Low temperature wash

- Laundry detergents and additives used must have instructions appropriate for the selected water temperature.
- Use of EPA-registered laundry sanitizer is optional.
- EPA- registered sanitizer with specific microbial label claims are not required.
(individual states may have different regulations)

NEW Bleach Rinses

New - Bleach Rinses for Low Temperature Washing

- No longer recommended
- Damages *newer* fabrics and leaves residues
- Difficult to control
- Disinfection not industry standard



DRAFT NEW CMS IGs **technology :Ozone**

Ozone technology

- Chemicals generated on demand by computerized engineered board for big tunnel washers.
- Highly efficient (energy and water use)
- Oxidizes chemicals
- Acceptable process per CMS



DRAFT NEW CMS

Requirements for Laundering

- Bleach is an option for bleach tolerant linens.
- Must select the operational parameters for laundering processes
 - wash/rinse water temperatures
 - laundry additives and detergents
 - washer/dryer (volume)

In accordance with manufacturer's instructions for the fabrics, the laundry equipment, and the laundry chemicals used.

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Q & A Time



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Please send questions or comments to:

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