

Clostridium difficile and MDROs: Mission Impossible?

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Guideline recommendations: Epidemiology

- CDI cases defined
 - Healthcare facility-onset (HO) CDI
 - Community-onset, healthcare facility-associated (CO-HCFA) CDI
 - Community-associated (CA) CDI
- CDI incidence and rates
 - HO-CDI number of cases per 10,000 **patient days**
 - CO-HCFA prevalence number cases per 1000 patient **admissions**
- Pediatric institutions same standardized case definitions and rate expressions

Major differences?

- Epidemiology, diagnosis, treatment, prevention CDI
- Test **ONLY** new-onset, unexplained, clinically significant diarrhea (≥ 3 unformed stools in 24 hours)
- 10-day course (PO) Vancomycin as first line
- Probiotics and fecal microbiota transplantation (FMT)

Diagnosis of CDI

- Molecular tests [NAATs]
 - Nucleic acid amplification tests (i.e. polymerase chain reaction-PCR)
 - These do not differentiate colonization versus infection
- Limit testing patients:
 - Do NOT test formed stools
 - No specimens after laxatives
 - Do not retest within 7 days of previous negative
- Children ≥ 2 years:
 - test if prolonged or worsening diarrhea + risk factors
 - relevant exposures

Treatment recommendations for children

- Metronidazole for initial/first recurrence mild/moderate CDI
- Vancomycin preferred for multiply recurrent and/or severe CDI
- Phase 3 investigations underway for Fidaxomicin
- FMT *can* be considered with multiply recurrent CDI

Infection Prevention and Control

- Private room with dedicated toilet

- Individual bedside commode

- HCW (healthcare workers) **must:**
 - gloves and gowns room entry
 - while providing care for CDI patients

ISOLATION: Standard Precautions *plus* *contact precautions*

- Implement *contact precautions* with suspect patients
- Continue precautions 48 hours AFTER diarrhea resolved
- IF rates remain high despite precautions, keep patients in isolation until discharge

Importance of Hand Hygiene (HH)

- Perform before/after contact with patient
- Perform after glove removal
 - Can use soap and water
 - Can use alcohol-based hand hygiene product (ABHR-alcohol based hand rub)
- CDI outbreak or sustained high rates of infection (hyper endemic)
 - Should use soap and water (not ABHR)
- Soap and water is preferred:
 - if direct contact with feces
 - area where fecal contamination is likely

Patient Care

- Teach patients:
 - Wash hands often and before leaving room
 - Shower to reduce spores on skin
- Include family/visitors in HH practices
- Acknowledge survival times of *C. difficile*

Equipment and Environment

- Disposable patient equipment
- Single use (b/p cuff and sphygmomanometer, stethoscope, thermometer) items
- Reusable equipment and room/furniture must be cleaned *then* disinfected (use sporicidal disinfectant)
- During outbreaks or hyper endemic, clean room daily with sporicidal disinfectant

Environmental Disinfection

- IP and EVS incorporate measures for evaluating effectiveness
- Automated disinfection with sporicidal
- No evidence for airborne transmission

Asymptomatic carriers...

- There are insufficient data to recommend screening for asymptomatic carriage and placing asymptomatic carriers on contact precautions (*no recommendation*).
- What is the risk of transmission by asymptomatic carriers? Surveillance testing, or “test of cure,” should NOT be done on asymptomatic carriers.
- Guide to the elimination of *Clostridium difficile* in healthcare settings, APIC elimination guide, 2008: 59

Other treatment comments

- Insufficient data of probiotics as primary
- If ileus, vancomycin per rectum is an option
- Surgical management, subtotal colectomy
 - Preservation of rectum
 - Diverting loop ileostomy
 - Colonic lavage with antegrade vancomycin flushes

Specific regimen for (PO) vancomycin with recurrence

Additional options if >1 recurrence

- FMT recommended multiple recurrences of failed treatments

This slide is not in your handouts **Key Concepts**

- Patient susceptibility to *Clostridium difficile* infection (CDI) requires prior antimicrobial treatment.
- Healthcare personnel transmit *C. difficile* on their hands.
- *C. difficile* spores may contaminate the healthcare environment.
- Patients asymptomatically colonized with *C. difficile* are at reduced risk of infection.
- Barrier precautions can be used to prevent *C. difficile* from reaching the patient.
- Thorough environmental cleaning reduces spore contamination and CDI incidence.
- Effective antimicrobial stewardship can significantly reduce CDI rates.
- APIC text online, Chapter 72 CDI and Pseudomembranous colitis

MDROs: an alphabet

- MRSA Methicillin Resistant *Staphylococcus aureus*
- VRSA, VISA vancomycin-resistant and vancomycin intermediate-resistance *Staphylococcus aureus*
- VRE Vancomycin Resistant *Enterococcus*
- ESBL extended spectrum beta-lactamase resistance (gram negative bacteria - GNB)
- MDR-*Pseudomonas aeruginosa* and *Acinetobacter baumannii*
- CRE Carbapenemase Resistant *Enterobacteriaceae*
- CDI *Clostridium difficile* infection

Management of Multidrug-Resistant Organisms in Healthcare Settings, 2006

- Centers for Disease Control and Epidemiology, CDC:
 - document major focus range of resistance in multiple healthcare facility settings

- Document revision was completed February 15, 2017.

- <https://www.cdc.gov/infectioncontrol/guidelines/mdro/>

Epidemiology of MDROs

- MRSA first isolated in US 1968
- VRE emerged in eastern US early 1990s
- Clinical infection low in LTCF (long term care facility) but can cause serious disease and mortality
- Selective pressure, increased MRSA colonization/infection, inadequate infection control practices

Pediatric infections

- $\leq 4\%$ patients in PICU/NICU with MRSA
- 10-24% patients colonized with GNB (gram negative bacilli)

General recommendations

- Administrative Measures
- Education and Training of HCW
- Appropriate antimicrobial agent use
- Surveillance
- Infection Control
- Contact Precautions
- Long Term Care, Ambulatory Care, Hemodialysis and in-home care settings
- Environmental Measures
- Intensified interventions

How to understand and implement

- CDC infection control assessment review
- Multidisciplinary processes
- Data analysis from laboratory
- Communication of data findings

Ethical considerations for MDRO carrier

- Health inequity carrier excluded from medical treatments/delay in care
- Social injustice excluded from (benefits of) going to work
- Asymptomatic carriers may not have a health effect
- Outbreak management
 - Quarantine
 - Isolation
 - Social distancing measures

Rump B, Timen A, Hulscher M, Verweij M. Ethics of infection control measures for carriers of antimicrobial drug-resistant organisms. *Emerg Infect Dis.* 2018;24(9):1609-16.

Ethical considerations (continued)

- Non-defining factor in slowly evolving threat
 - Long-term clinical effect may be high
 - Restrictions role leads to control???
 - Immediate threat limited

Applicability

- Effect of policy/guideline on staff
- Purpose of facility policy/protocol
- Common sense
- WATP

References

- McDonald LC, Gerding DN, Johnson S, et al. Clinical practice guidelines for *Clostridium difficile* infection in adults and children: 2017 update by the Infectious Diseases Society of America (IDSA) and Society for Healthcare Epidemiology of America (SHEA) [published online February 15, 2018]. *Clin Infect Dis*.doi:10.1093/cid/cix1085
- Magill SS1, Edwards JR, Bamberg W, et al. Emerging infections program healthcare-associated infections and antimicrobial use prevalence survey team. Multistate point-prevalence survey of healthcare-associated infections. *N Engl J Med*. 2014;370:1198-1208.
- Lessa FC, Mu Y, Bamberg WM, et al. Burden of *Clostridium difficile* infection in the United States. *N Engl J Med*. 2015;372:825-834.