Targeting Zero Infections: Management of C-diff in Outpatient Hemodialysis Settings

The eighth webinar of the Targeting Zero Infections series

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Welcome

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Disclosures

**Employer:** Metabolism Associates, New Haven

**Consultancy Agreements:** ASN

**Honoraria:** several universities and medical schools, professional organizations – honoraria for lectures, seminars, webinars

**Other Interests/Relationships:** Renal Physicians Association; American Society of Nephrology
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Housekeeping

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Following today’s webinar, the recording, slides, and speaker bio handout will be posted on the ASN NTDS website at: https://www.asn-online.org/ntds.
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Today’s Speakers

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Yale School of Medicine

ERIKA D’AGATA, MD, MPH
Professor of Medicine
The Warren Alpert Medical School of Brown University

NICOLE GUALANDI, MS/MPH, RN, CIC, FAPIC
Centers for Disease Control and Prevention

SUSAN STARK
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Excellence in Patient Care
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CDI in the Outpatient Dialysis Setting: What You Need to Know

ERIKA D’AGATA, MD, MPH
Disclosures

Employer: Brown Physicians Incorporated
Research Funding: 2020-2025 Agency of Healthcare Research and Quality optimizing Antimicrobial Use in Maintenance Hemodialysis Units; 2016-2021 National Institute of Allergy and Infectious Diseases; Midcareer Investigator Award in Patient-Oriented Research
Morbidity and Mortality

THE IMPACT OF *C. difficile* Infection (CDI)

**CDI is serious, deadly, and expensive**

- **29,000 US deaths/year** within 30 days of diagnosis
- **1 in 5** (83,000) recurrences within 2 months
- **CDI adds up to:**
  - **12 days in the hospital** and
  - **$27,160 per case** in direct costs

**More than 1/3 of CDI cases are not associated with inpatient stay**

- **29%** outpatient healthcare exposures including doctor and dentist offices
- **65%** at least one overnight, inpatient hospital stay
- **6%** not healthcare-associated

Morbidity and Mortality associated with CDI

• Most common cause of gastroenteritis-related deaths

• In 2017, C. difficile was responsible for almost half a million infections and >20,000 deaths

• One of the most common hospital-acquired infections

• Ongoing spread within the community setting, accounting for up to 42% of all CDI

Risk factors for *C. difficile*: all populations

- Antimicrobial exposure
- Advanced age
- Comorbidities, including requirement for maintenance hemodialysis
- Residing in a nursing home

TRANSMISSION DYNAMICS OF MULTIDRUG-RESISTANT ORGANISMS AND *C. difficile* IN THE HOSPITAL SETTING

No MDRO/CDI

+ MDRO/CDI

• compliance with hand hygiene
• compliance with gowns
• number of pt contacts
• number of HCW

• antibiotic exposure
• level of nursing care
• diarrhea/wound
• length of hospital stay
Role of *C. difficile* spores

- Anaerobic spore-forming bacterium
- Prolonged survival (several months) on inanimate surfaces
- Resistant to commonly used disinfectants targeting MDRO eradication
Role of *C. difficile* spores cont’d

• Issue of soap and water vs alcohol-based sanitizers
  • Alcohol-based sanitizers do not effectively eliminate spores
  • CDI rates have not shown to increase with use of alcohol-based sanitizers
  • Greater compliance with alcohol-based sanitizers
  • Alcohol-based sanitizers are an alternative hand-hygiene measure
  • Soap and water is always preferred
  • In outbreak settings, always use soap and water
Role of *C. difficile* spores cont’d

• Use disinfectants from the EPA’s Registered Antimicrobial Products Effective against the spores of *C. difficile* (List K).

  - [https://www.epa.gov/pesticide-registration/list-k-epas-registered-antimicrobial-products-effective-against-clostridium](https://www.epa.gov/pesticide-registration/list-k-epas-registered-antimicrobial-products-effective-against-clostridium)
Morbidity and Mortality among persons on maintenance hemodialysis (MHD)

- Patients on MHD are 2-2.5 times more likely to develop CDI
- Mortality rates among the MHD population with CDI are 2-fold higher than those without CDI
- From 2004-2013, hospitalization rates for CDI among prevalent MHD patients increased by 68%
- Lengths of hospitalizations related to CDI are longer for MHD patients compared to the general population

Risk factors for *C. difficile*: persons on MHD

- Antimicrobial exposure
- Low albumen (<3g/dL)
- High Charlson comorbidity score (Higher number of comorbidities)

Outbreaks of CDI in out-patient dialysis units

Michigan outpatient dialysis facility between October 2012 and March 2013
- eight of 37 patients (21.6%) and one HCP developed CDI
- inadequate hand hygiene, insufficient wet contact times of bleach on surfaces, and patients without CDI were being dialyzed at designated CDI-only stations

-implementation of control measures
  designating three dialysis stations for CDI patients
  donning gloves and isolation gowns
  soap and water for hand hygiene
  1:10 dilution of bleach to disinfect dialysis stations used by CDI patients

Clinical and Economic Benefits of ASP in Outpatient Dialysis Facilities

• Goal: to quantify the clinical outcomes and costs associated with implementing an ASP throughout the United States
• Decision analytic model – informed by literature and expert opinion
• Main outcomes
  • Total antimicrobial use
  • Rates of VRE/MRSA/MDRGN and *C. difficile* infections
  • Infection-related mortality
  • Costs

Clinical and Economic Benefits of ASP in Outpatient Dialysis Facilities

• On a nationwide level, implementation of ASP which decreased inappropriate antimicrobial prescribing by 20% resulted in:

1. 4.8% (N=2,182) reduction in MDRO and *C. difficile* infections
2. 4.6% (N=629) reduction in infection-related deaths
3. 5% ($106,893,517) reduction in costs

The model was most sensitive to clinical parameters vs antimicrobial costs
Impact of decreasing antimicrobial use in outpatient dialysis units

The positive effects of an antimicrobial stewardship program targeting outpatient hemodialysis facilities

- Educational and behavioral interventions
- 6% monthly reduction in antimicrobial prescribing per 100 pt months
- Vancomycin to cefazolin
- Discontinuing antimicrobials when criteria for infection not met
- No negative consequences
  - rates of blood stream infections and hospitalizations

Suggestions for the prevention of *Clostridioides difficile* spread within outpatient hemodialysis facilities. Kid Int 2021;99:1045-53

**NTDS initiative**

- To provide practical strategies and guidance for managing CDI in outpatient dialysis facilities
- Suggestions/recommendations are directed at adult outpatient hemodialysis facilities
- As with any recommendations, should not substitute for individual clinical judgement
- Author panel - composed of nephrology and infectious disease physicians, clinical nephrology nurse specialists, clinical managers of dialysis facilities, public health experts, and infection preventionists
Suggestions for the prevention of *Clostridioides difficile* spread within outpatient hemodialysis facilities. Kid Int 2021;99:1045-53

AUTHOR PANEL

- E.M.C D’Agata MD MPH – Brown University
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- S. Novosad MD MPH- Division of Healthcare Quality Promotion CDC
- P.M. Palevsky MD- VA Pittsburgh Healthcare System, Pittsburgh, Pennsylvania -President NKF
- D. Rodgers RN- American Society of Nephrology Alliance for Kidney Health
1. What IPC resources/activities should outpatient hemodialysis facilities have in place for the prevention of CDI transmission and care of patients with CDI?

- Develop and maintain a robust IPC program that is integrated within the QAPI program.
- Assure at least one individual with training in IPC is regularly available to the facility.
- Have a written policy detailing IPC precautions specifically designed to prevent the transmission of *C. difficile*.
- Provide education and training to all HCP on the basic principles and practices for preventing the spread of CDI.
- Provide CDI education to patients,
- Conduct regular surveillance for CDI, calculate facility rates, and share results with front-line clinical staff.
- Encourage judicious use of antimicrobials through implementation of antimicrobial stewardship activities.
- Ensure open communication with other healthcare facilities.
- Contact local or state health department if an outbreak or cluster is detected or if transmission is identified within the facility.
2. What are the preferred hand hygiene measures for HCP when caring for a patient with suspected or confirmed CDI?

- Wear gloves when caring for patients with CDI to reduce hand contamination
- Perform hand hygiene before donning gloves and after removing gloves.
  - Soap and water is preferred, however, use of an alcohol-based hand rub is acceptable unless there is an outbreak or concern for horizontal transmission within the facility.
- Perform handwashing with soap and water if there has been direct contact with feces or an area where fecal contamination is likely.
- Encourage patients to perform hand hygiene and increase personal hygiene measures prior to their dialysis session.
- Audit HCP hand hygiene compliance and provide feedback
3. What PPE should be worn when caring for a patient with suspected or confirmed CDI

- Wear gloves when caring for CDI patients and remove and immediately discard gloves when finished.

- Wear a new gown over usual clothing during high-contact patient care activities.

- Use disposable face shields for each interaction that warrants face protection and immediately discard after each use.

- Remove PPE slowly and deliberately in a sequence that prevents self-contamination.
4. What is the preferred placement for dialysis treatment for patients with CDI?

- Assess patients for signs and symptoms of CDI prior to their entry to the treatment area.

- Provide dialysis during sessions with the fewest number of other patients or minimal number of adjacent stations as possible.

- Consider using isolation room if there are no hepatitis B-infected patients being cared for in the facility and the room has been terminally cleaned.

- The dialysis station or isolation room should be thoroughly cleaned with *C. difficile*-active disinfectants after dialysis of patients with CDI.
5. What bathroom facilities should be provided to dialysis patients with CDI?

- Bathroom facilities should be thoroughly cleaned with *C. difficile*-approved disinfectants after use by a patient with CDI.
- Assess the patient prior to entering the treatment floor to determine if they are having active diarrhea or incontinence.
- Limit use of bedpans and bedside commodes in the treatment floor.
- Roll-out screens, if used for toileting privacy, should be non-porous and immediately cleaned and disinfected with *C. difficile*-approved disinfectants after use.
- Change and discard all PPE and perform hand hygiene with soap and water, immediately after assisting the patient with toileting activities.
6. What is the appropriate length of time to maintain precautions?

- CDI-specific precautions should be continued for at least 48 hours after the diarrhea has ceased.

- If signs and symptoms of CDI recur after precautions have been discontinued, CDI-specific precautions should be resumed.

- CDI-specific precautions beyond 48 hours should be considered if CDI rates remain high despite implementation of CDI IPC measures.
7. What are the optimal measures for environmental disinfection?

- Thoroughly clean and disinfect the station after the patient with CDI completes their dialysis treatment and exits the station.

- Use disinfectants from the EPA's Registered Antimicrobial Products Effective against the spores of *C. difficile* (List K).
  - [https://www.epa.gov/pesticide-registration/list-k-epas-registered-antimicrobial-products-effective-against-clostridium](https://www.epa.gov/pesticide-registration/list-k-epas-registered-antimicrobial-products-effective-against-clostridium)

- Limit multiuse items and dedicate patient care items that are typically multi-use to the care of the patient with CDI.

- Audit staff practices to ensure effective environmental disinfection is occurring and provide feedback.
SUMMARY

• These recommendations follow the same principles outlined by CDC, SHEA and IDSA in preventing *C. difficile* spread

• They are extended to consider the unique setting of the dialysis facility

• Further research is needed to gain a better understanding of *C. difficile* epidemiology, transmission and the most effective infection prevention strategies in the outpatient dialysis setting
Help...We Have a Case of CDI in our Facility; What Should We Do?

NICOLE GUALANDI, MS/MPH, RN, CIC, FAPIC
Disclosures

**Employer:** Centers for Disease Control and Prevention

**Other Interests/Relationships:** Member of Association for Professionals in Infection Control (APIC), currently the chair of the APIC 2021 Annual Conference Committee
SAMPLE TITLE

Name, Degrees
Title

Event Title

Date
Case Scenario #1
Mrs. A – Arrival in clinic

- Covid-19 screening in waiting area
- Enters treatment area interacting with:
  - Multiple doors
  - The scale
  - The designated access washing sink
- Gets settled in her treatment chair
Mrs. A - Connection

- Cannulation and connection per usual practice
- After connection, Mrs. A informs the technician
  - Not feeling well past few days
  - Nausea and diarrhea
- Clean hands thoroughly with alcohol hand gel
- Charge RN
  - Receives and order for a stool culture
  - Educates the patient on how to collect the sample
Mrs. A – Interruption of treatment

Mrs. A informs the tech that she needs to use the restroom *urgently*

1. Use portable commode and cloth screen barrier
2. An alarm goes off at another station within the pod/bay
   - Answer alarm then remove gloves
   - Perform HH using alcohol hand gel
   - Put on a new clean pair of gloves
   - Return to Mrs. A.
3. Assist her with getting back to her treatment chair
4. Reconnect to the machine
Mrs. A – Disposal of...

- Obtain sample per protocol
- Discard contents of commode in dirty utility (hopper)
- Discovers that a co-worker has assisted:
  - Put the barrier, and
  - Commode supplies away
- Removes gloves and uses alcohol hand gel
Mrs. A – Exiting clinic

- Mrs. A’s treatment is completed
  - Goes to the scale
  - Utilizes a common use wheelchair to exit the treatment area
  - Uses the automatic door button
  - Meets significant other in waiting area
- No visible contamination at her station
- Perform routine disinfection and get ready for second shift patient
Mrs. A – Case Scenario Concerns

- High touch surface contamination by potentially dirty hands
  - Scale, door handles/buttons
- Same gown worn by technician even after helping with high contact activities, fecal specimen collection, and cleaning of commode
- Contaminated gloves not changed when silencing a machine alarm at another station
- Technician unsure if commode and privacy screen were appropriately cleaned/disinfected when put away
- Common use wheelchair not cleaned/disinfected before use by another patient
Case Scenario #2

Applying CDI recommendations
Mr. B – Arrival in clinic

- Covid-19 screening in waiting area
- Mr. B reports the following:
  - Not been feeling well
  - Nausea
  - Diarrhea
- Ask Mr. B to wait a bit longer
Mr. B – Arrival in clinic (continued)

- Discuss with charge RN
- Set up machine with fewest number of adjacent stations
- Escort Mr. B into treatment area
- Clean and disinfect with appropriate disinfectant
  - Waiting area
  - Scale
  - Sink
Mr. B - Connection

- Perform cannulation and connection to the machine per usual practice
- Remove PPE slowly and deliberately prior to exiting the patient station and perform hand hygiene
- The Charge RN who received the order for a stool culture educates the patient on how to collect the sample and provides the proper supplies.
Interruption

- Mr. B needs to use the restroom
- Upon return:
  - Teaching moment opportunity for hand hygiene
  - Hang sign on bathroom and inform EVS
  - Clean ancillary items
- Reconnect to treatment using proper PPE
Exit

- Doff PPE appropriately and perform hand hygiene, then don a new clean pair of gloves
- Escort to scale; clean and disinfect
- Escort to entrance/exit of building
- Return and don new appropriate PPE
- Clean and disinfect:
  - Patient station
  - Supplies (dedicate to patient)
  - Wheelchair used
Wednesday

- Again, you prepare treatment chair and machine with fewest adjacent stations
  - Use dedicated supplies
- Less than 48 hours since last treatment
- Assess last episode of diarrhea once Mr. B arrives to determine when precautions can be lifted

When should precautions be lifted?
Mr. B – Case Scenario Highlights

- High touch surfaces were frequently cleaned/disinfected
  - Scale, door handles/buttons
- Appropriate station placement
- PPE changed after helping with high contact activities
- Patient privacy maintained through use of restroom
- Restroom contamination limited by cleaning/disinfecting after use by a C. diff patient
- Common use wheelchair was cleaned/disinfected before use by another patient
Q&A / Discussion

Moderator: Alan Kliger, MD

Panelists
• Erika D’Agata, MD, MPH
• Nicole Gualandi, MS/MPH, RN, CIC, FAPIC
What should facilities do if the stool specimen is positive, but the patient is asymptomatic?

Do they act based on the test or the symptoms?
What should facilities do if patients have diarrhea/other symptoms, but their CDI status is not known?
Concluding Remarks

SUSAN STARK
Disclosures

Employer: American Society of Nephrology
Consultancy Agreements: Susie Stark – none; Jay Wish (husband) – Vifor, Akebia, AstraZeneca, Otsuka, and Rockwell Medical
Honoraria: Susie Stark – none; Jay Wish (husband) – Vifor, Akebia, AstraZeneca, Otsuka, Rockwell Medical Amgen
Scientific Advisor or Membership: Susie Stark – none; Jay Wish (husband) – Vifor, Akebia, AstraZeneca, Rockwell Medical, CJASN, JASN and NN&I Editorial Boards
Speakers Bureau: Susie Stark – none; Jay Wish (husband) – Akebia, AstraZeneca
Other Interests/Relationships: Susie Stark – none; Jay Wish (husband) – DaVita (Medical Director Agreement)
Thank you for your participation

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