



CDI Strategy: Lessons Learned
August 18th, 2016
Nicole Barnett, MSN, BSN, RN, CIC, CHC

Mercy Health Cincinnati Market

Hospitals and Infection Preventionist

- Mercy West: Vicki Wright, BSN, RN, CIC
- Mercy Fairfield: Janet Miller, BSN, RN, CIC
- Mercy Anderson: Cindy Childress, MSN, MS, BSN, RN
- Mercy Clermont: Mary Barnett, BSN, RN, CIC
- Regional Support: Leigh Talmon, BSN, RN
- The Jewish Hospital & Regional Manager Cincinnati Market: Nicole Barnett, MSN, BSN, RN, CIC, CHC

State of Affairs

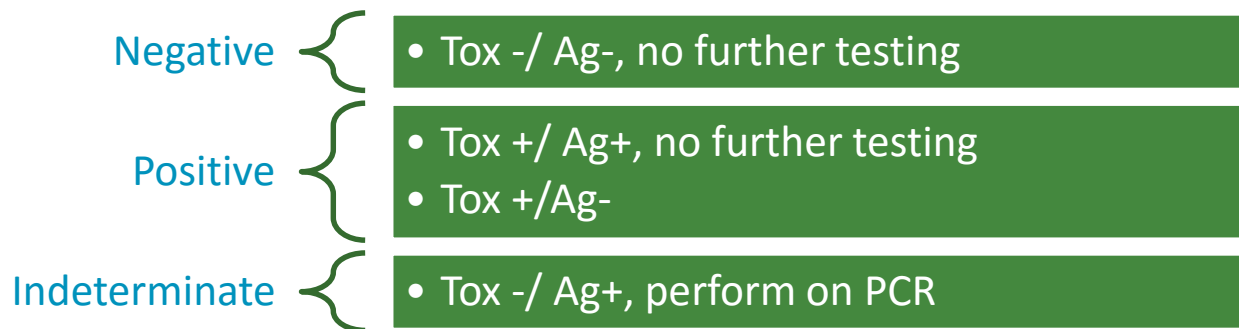
Hospital	2014 SIR	2015 SIR	1H16 SIR	% Reduction from 2015
Anderson	2.488	1.724	1.16	28%
Clermont	2.167	0.915	0.94	23%
Fairfield	0.77	0.505	1.19	64%
Jewish	1.419	1.851	0.73	29%
West	1.493	1.116	0.93	37%

Note the increase at The Jewish Hospital from 2014 – 2015. 3rd quarter is always a challenging quarter with the onboarding of new resident providers.

Note the increase at Fairfield from 2015 to 1H16. An increase in cases was identified and processes have been put into place to address. July has seen a 50% decrease in cases in 2016 compared to July 2015.

Testing Methodology

2 Step algorithm



- **20% of results are indeterminate and referred to PCR**
- **Of those- 7% are positive on PCR**

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ASSESSMENT

APIC CONSULTANT

Background: On November 24, 2014 APIC was consulted with the following goals:

1. Evaluate the incidence of *C. diff* lab ID events at 5 hospitals in the Mercy Health system in the Cincinnati, OH area: Anderson, Clermont, Fairfield, Jewish, and West.
2. Conduct on-site evaluations in each of the five hospitals.
3. Provide recommendations for consideration.
4. Provide a final presentation for facility leadership.

APIC CONSULTANT

Methods: CMS Hospital Compare Website was reviewed to determine if higher than expected SIRs were reported.

1. NHSN line lists were generated by each facility for case trending.
2. Trend data was provided by month or quarter. Used NHSN criteria to classify cases: CO, CO-HA, HA, or recurrent. Relationship between admission prevalence and hospital incidence was assessed using New York State data as comparison.
3. Emergency department admission data for CDI patients and all patients by hospital.
4. December 13-15 2014 on-site visits were conducted. Patient care units were prioritized for on-site observation using their hospital onset incidence rates.

APIC CONSULTANT

Findings: Hospital Compare data revealed 4-5 hospitals (West, Anderson, Fairfield, and Jewish) had higher than expected CDI Lab ID event rates. Compared to New York State hospital, all five hospitals had a higher proportion of community onset cases and a lower proportion of hospital onset cases.

1. Medical record review revealed prompt identification of possible *Clostridium difficile* infection (CDI), testing and documentation of results.
 1. When and if documented properly, clinical staff appeared to **use a low threshold for testing**, frequently testing the first or second loose stool.
 1. Documentation of bowel movements was often lacking.
 2. In some cases, there was no documentation as to why *C. diff* testing was ordered.
 2. This may account for the relatively high proportion of cases classified as community-onset.

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PLANNING & IMPLEMENTATION

Bundles for Prevention of C. difficile Infection (CDI)

Antimicrobial Stewardship/Drug Management Bundle

- Evidence-based management and treatment
- Judicious use of all antibiotics
- Robust A.S. program led by pharmacy and physician champion
- Assess use of probiotics
- Assess use of proton pump inhibitors
- Educate providers and patients

Detection Bundle

- Early recognition: C-diff assessment on admission. Shift assessment by nursing for new onset diarrhea.
- Testing Criteria
- Proper collection and handling of specimens (timeframe & temp)
- Appropriate testing:
 - PCR
 - Antigen/toxin assay
- Retesting Criteria
 - No testing for cure.

Practice Bundle

- Early isolation
- Contact Plus Precautions
 - Gown
 - Gloves
 - Signage
 - Approved hand hygiene
- Equipment
 - Available
 - Dedicated
 - Disposable
 - Disinfected if reusable

Cleaning Bundle

- Environment
- Equipment
 - ID C-diff contaminate d equipment for cleaning
- Daily Cleaning
- Terminal Cleaning
- Use of Checklist
- Appropriate dwell time for cleaning solutions.
- Consider use of bleach solution or wipes for daily and terminal clean
- Competency Assessment

People Bundle

- Administrative support
- Competency
- Compliance
- Coach
- Communicate
- Involve and educate patients/families
- Educate all staff
- Collaborative efforts beyond the hospital

FOCUS: Practice & Cleaning Bundle Components

Patient Information				Detection		Practice - Observe/Interview						Cleaning - Observe/Interview							
Last Name	First Name	MRN	Account #	Admission Date	Discharge Date	Admission Screening?	Collect/Receipt w/in 1 hr?	Documentation/Order entered at time of collection?	Gown?	Gloves?	Signage?	Viewed hand hygiene?	Disposable Stethoscope Present?	Daily Cleaning ?	Terminal Cleaning ?	Use of Checklist ?	Used Bleach or Wipes?	Do they know appropriate dwell time?	Bleach available on Isol Cart?
1																			
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
Total Yes						0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total No						0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent Compliant						0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

STATE OF AFFAIRS

Hospital	1Q 2014		1Q 2015		% Reduction
	Rate/10K patient days	SIR	Rate/10K patient days	SIR	
Anderson	15.072	1.989	8.951	1.179	41%
Clermont	13.882	2.354	8.295	1.413	40%
Fairfield	13.135	1.616	8.734	0.985	36%
Jewish	12.984	2.007	7.626	0.941	41%
West	11.23	1.494	8.97	0.91	39%

FOCUS: People & Detection Bundle

- Intense analysis conducted of each event including front-line staff, committee members, or by email.
 - Chart review: poor documentation of number of stool occurrences or reason for testing; stool softener/laxative use, repeat testing, and testing for cure.
 - Nurse Screening for CDI: Patient having diarrhea? Very subjective.
 - Nurse Driven testing protocol: initiated without any defined guidance.

STATE OF AFFAIRS

1Q 2015 vs. 1Q 2016 HA-CDI SIR

Hospital	1Q15 SIR	1Q16 SIR	% Change
Anderson	0.963	1.555	61.48
Clermont	1.413	1.166	17.48
Fairfield	1.065	0.931	12.58
Jewish	0.941	0.952	1.17
West	1.012	0.952	5.93

SIR – Standardized Infection Ratio

RED – percent increase

GREEN – percent decrease

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ASSESSMENT

HSAG CDI Assessment

Criteria of CDI Assessment

CDI assessment focused on the evaluation of six domains believed to have the most impact in the transmission of CDI within an organization.

1. General Infrastructure, Capacity, and Processes
2. Antibiotic Stewardship
3. Early Detection, Isolation, and Appropriate Testing
4. Contact Precautions and Hand Hygiene
5. Environmental Cleaning
6. Laboratory Practices

HSAG CDI Assessment

Detection/Isolation/Lab Testing

- CDI screening criteria (when present) is inconsistent.
- CDI-related diarrhea is not clearly defined.
 - One episode of diarrhea versus three in 24 hours.
 - Stool for testing is ordered at arrival, but sample is not obtained for days after admission.
 - Order remains active indefinitely
 - LabID event HO criteria
 - Day 4 or greater

HSAG CDI Assessment

Detection/Isolation/Lab Testing (cont.)

- Lab staff members run CDI tests on formed stools and repeat stools.
 - Approved policies are in place with specific guidelines and expectations.
 - Approved protocols not consistently followed.

HSAG CDI Assessment

Environmental Cleaning

- EVS lack policies and procedures.
- Not following manufacturers' instructions for use.
 - Dwell times
- No consistency with cleaning product selection.
 - Bleach-based cleansers not being used in bathrooms.
 - Sanitizing solution used with no sporicidal kill claims in bathrooms/high-risk areas (e.g., gastrointestinal lab).
 - Staff select product based on preference rather than on kill claims/policies/protocols.

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PLANNING & IMPLEMENTATION

1 + 1 = Inappropriate Testing

1. APIC Consultant:

“When and if documented properly, clinical staff appeared to use a low threshold for testing, frequently testing the first or second loose stool.”

1. HSAG Assessment:

“CDI-related diarrhea is not clearly defined.

- One episode of diarrhea versus three in 24 hours.
- Stool for testing is ordered at arrival, but sample is not obtained for days after admission.
 - Order remains active indefinitely
 - LabID event HO criteria
 - » Day 4 or greater”

= Inappropriate Testing:

- Testing when clinically significant diarrhea is not present

1 + 1 = Inappropriate Testing

Other recognized examples of inappropriate testing identified on intense analysis:

1. Testing with other known causes of diarrhea (ex: laxatives)
 1. Unable to determine if “true” infection symptomology
2. Testing for cure
 1. CDI toxin may persist despite response to treatment
3. Repeat Testing to diagnose CDI
 1. Studies have demonstrated that repeat stool testing is ineffective for the diagnosis of CDI.

MULTI- DISCIPLINARY HEALTHCARE WORKER EDUCATION

Infection Prevention FAST FACTS 2016

C-diff infection (CDI)

Infections that are associated C-diff (CDI) are highly transmissible.

Transmission can be prevented!!

Strict adherence to Hand Hygiene & Transmission-Based Precautions are the most effective means of prevention.

Review these facts during huddle and staff meetings

Tips to ensure compliance with processes

C-diff Process Checklist

- C-diff admission assessment completed?
- Stool frequency documented?
- Stool consistency documented?
- Pt has diarrhea (i.e. forms to the shape of the cup) 3 times or greater over 24 hours (no formed stool should be sent).
- Pt on stool softeners? Follow Protocol.
- Contact Plus isolation ordered in EPIC, documented, & initiated?
- Specimen delivered to lab less than 1 hour from collection.
- Gown, gloves, disposable equipment, Bleach and hand washing used.

Stool Softener & C-diff testing

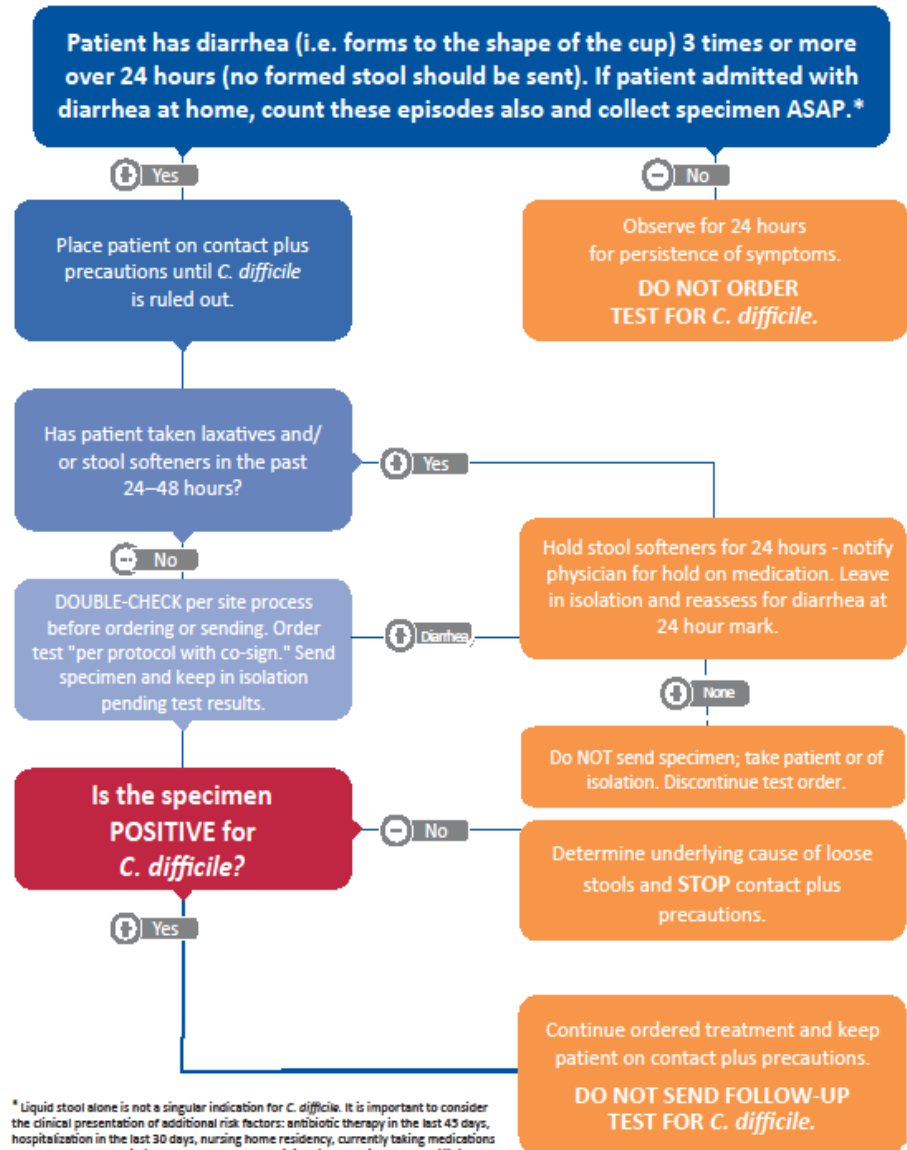
- Pt has diarrhea (i.e. forms to the shape of the cup) 3 times or greater over 24 hours (no formed stool should be sent).
- Place patient in contact plus isolation.
- Check to see if patient is on stool softeners-**IF YES-** hold stool softeners x 24hrs. Leave in isolation & reassess for diarrhea. If diarrhea order specimen testing. If diarrhea stops after holding stool softener do not send specimen and take patient out of isolation.
- If patient is not on stool softeners- send specimen and keep in isolation until result.

Private Rooms

- If patient is in a semi-private room & C-diff testing is ordered initiate isolation until a private room can be arranged.
- Order isolation in EPIC, ensure red box is in Awarix, place isolation cart outside of semi-private room, and place Contact Plus sign above patient's head.
- Ideally, the unaffected patient should be transferred out of room if possible. If the case then place Contact Plus sign on door.
- If affected patient transferred then leave sign above patient's bed for housekeeping to remove upon terminal clean.
- Transport patient according to Guideline for transporting isolation patients located on the Mercy Hub.

MOVING FROM EDUCATION ALONE TO A NURSING SUPPORT MODEL THROUGH THE USE OF A STOOL COLLECTION ALGORITHM

C. diff is considered hospital onset if positive after 3rd calendar date of admission.



* Liquid stool alone is not a singular indication for *C. difficile*. It is important to consider the clinical presentation of additional risk factors: antibiotic therapy in the last 45 days, hospitalization in the last 30 days, nursing home residency, currently taking medications to reduce stomach acid (such as proton pump inhibitors), and a history of *C. difficile*.

Nursing Support Model: Stool Collection Algorithm

- Mercy West: 2nd RN verifier.
- Mercy Anderson: Infection Prevention verification
- Mercy Clermont: Infection Prevention verification
- Mercy Fairfield: In field discussion
- The Jewish Hospital: 2nd RN verifier with lab rejection without signature.

Nursing Support Model: Celebration of Success

- A report within the EMR was built to review all active C-diff specimen testing orders.
- Infection Preventionist run this report twice a day to validate the process including:
 - Appropriate Testing
 - Isolation Order
- If there is a question the Infection Preventionist collaborates with the healthcare provider(s).

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IN ADDITION TO

In the mean time: ENVIRONMENTAL CLEANING

- Environmental Services leaders & Infection Prevention partnered to create & standardize:
 - Products: Reducing the number of products, educating on dwell times, and targeting areas for product usage (i.e. bleach for toilets and sinks)
 - Staff education and training: AHE certification for Leaders and front-line workers, check-offs on hire, and continuing education.

In the mean time: ENVIRONMENTAL CLEANING continued.

- Environmental Services leaders & Infection Prevention partnered to create & standardize:
 - Daily and Terminal clean policies – able to be used to guide cleaning.
 - Celebrating success through ATP monitoring - setting the expectation and communicating success.
 - This work is continuing to expand to OR and specialized areas.

HA-CDI Quarterly SIR Update

Hospital	2015		2016		% Change from 2015
	1Q15	2Q15	1Q16	2Q16	
Anderson	0.96	1.75	1.48	0.81	1Q: +54% 2Q: -54%
Clermont	1.41	0.92	1.11	0.75	1Q: -21% 2Q: -19%
Fairfield	1.07	0.52	0.93	1.47	1Q: -13% 2Q: +183%
Jewish	0.94	0.44	1.14	0.33	1Q: +21% 2Q: -25%
West	1.01	2.1	1.14	0.94	1Q: +13% 2Q: -55%

2nd quarter was the implementation of the HA-CDI appropriate testing protocol.

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IN SUMMARY

BOTTOM LINE

- Methodology: Use a bundled approach to assessment and intervention.
 - Allows you to recognize and target opportunities for improvement in a systematic manner.
- Expectations: Clearly define them
 - Nurse driven protocol for specimen testing without a clear definition of “diarrhea”.
 - No policies or check-offs to guide cleaning practices

BOTTOM LINE

- Support: Monitoring and communicating opportunities for improvement.
 - Nursing support model: provides a “second eye”.
 - Celebrating and communicating success of Nursing support model through twice a day specimen order review.
 - EVS certification
 - Celebrating and communicating success of cleaning practices through Adenosine Triphosphate (ATP) monitoring.

BOTTOM LINE

- Multidisciplinary review: Work as a team with front-line staff to assess and correct barriers to “best practice”.
 - Crucial intervention, improves staff and provider engagement
- Collaborate with your state Quality Improvement Organization (HSAG)
 - Provides additional tools and resources
 - Assists with data validation
 - Assists with case review
 - Promotes leadership support
 - Provides opportunities for networking

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Next Steps

- Review Bundle Components for the next steps:
 - Detection Bundle:
 - Early Recognition: EMR C-diff Screen
 - Cleaning Bundle:
 - ATP program
 - Equipment cleaning/disinfection: Cleaning process of dietary carts and/or other mobile equipment.
 - Antibiotic Stewardship
 - People
 - Patient Hygiene Program

Questions



References

APIC Guide to Preventing *Clostridium difficile* Infections.

Health Services Advisory Group (2016). Clostridium difficile Infection Tracer Tool.

Health Services Advisory Group (2016). Clostridium difficile Infection Stool Collection Algorithm. Modified with permission to create Mercy Health algorithm.

Norris, Brenda (2016). TriStar Skyline Medical Center C. difficile Team Action Plan. TN Department of Health and Alliance for Powerful Change (atom).

SHEA/IDSA Practice Recommendation Strategies to Prevent *Clostridium difficile* Infections in Acute Care Hospitals: 2014 Update

Stricof, Rachel. (2015). Higher than Expected Incidence of Hospital-Onset Clostridium difficile Laboratory-Identified Events. APIC Consulting Services, Inc..