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Implementing Antimicrobial Stewardship and *C.difficile* Prevention Toolkit

Prepared by the Hospital and Healthsystem Association of Pennsylvania Quality Initiatives Department Healthcare Associated Infection Prevention Managers

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1921 HAP 2021
100 YEARS TOWARD BETTER HEALTH

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Goal

The goal is to decrease *Clostridioides difficile* Infections (CDI) by 20 percent from a set baseline. Through previous collaboratives, following evidence-based practices as listed in this toolkit will make this goal attainable in reducing CDI and other MDROs.

Background

Clostridioides difficile has become the most common cause of healthcare–associated infections (HAI) in U.S. hospitals. The excess health care costs related to *C. difficile* infection are estimated to be as much as $4.8 billion for acute care facilities. These infections lead to increased mortality, length of hospital stay, costs, and recurrence.

Early identification, use of contact precautions, environmental cleaning, and antimicrobial stewardship have been shown to decrease CDI. Research studies have also shown that patients who develop a recurrence of CDI are at a higher risk of readmission within 30 days to an acute care hospital.

Research has shown that patients infected with the epidemic strain of C. difficile (NAP1/027) have a higher risk of morbidity and mortality. This is due to the increased incidence and virulence of the strain especially in older patients and patients admitted from nursing homes. Another risk factor for developing CDI is the use of medications that suppress gastric acid secretions.

The cost of a CDI can vary depending on whether the patient is admitted with it, develops it during admission, or has recurrent CDI. More than 50 percent of the hospital onset CDI infections are diagnosed in the community. It is estimated that the cost of treating patients with CDI in the United States runs over one billion dollars.

Beginning during fiscal year 2017, the Hospital-Acquired Condition (HAC) Reduction Program has reduced Centers for Medicare & Medicaid (CMS) payments to hospitals who are identified as being in the lowest 25 percent quartile (having the highest number of CDI).

Antibiotics represent the greatest risk factor for the development of CDI. While appropriate for treatment of many infectious diseases, antibiotics are often overused and misused. Antibiotics disturb normal bowel flora and place the patient at risk of acquiring Clostridioides difficile colonization and/or infection. Antibiotic Stewardship Programs (ASP) have been shown to be an integral part of a CDI reduction program. Some of the strategies used to develop an effective Antibiotic Stewardship Program and improve the use of antibiotics are:

- Use of a physician champion and pharmacist trained in infectious disease or interested in antibiotic usage
- Change of broad-spectrum antibiotics to narrow spectrum antibiotics (de-escalation) as soon as laboratory results and antibiotic susceptibility patterns are available
- Discontinuing antibiotics when not needed or culture results are negative
- Pharmacy review of all bug-drug mismatches
- Formulary restriction or prior authorization for the use of certain antibiotics
- 48-hour timeout for re-evaluation of antimicrobial therapy
- Development of an antibiogram at least annually to monitor trending in bacterial resistance
- Use of standard protocols for the treatment of patients admitted with community acquired infections
- Institution of automatic changes from IV to oral therapy where appropriate
- Use of automatic stop orders for surgical prophylaxis

The misuse of antibiotics has also contributed to the growing problem of antibiotic resistance resulting in an increase in mortality from untreatable infections. Each year in the United States, at least 2 million people become infected with bacteria that are resistant to antibiotics and at least 23,000 people die as a direct result of these infections.

Improving the use of antibiotics is an important patient safety and public health issue. It is a key component in the National Strategy on Combating Antibiotic Resistant Bacteria. Hospitals should be working towards more appropriate and prudent use of antibiotics by establishing core elements of an antimicrobial stewardship program.

Purpose of the Toolkit

The purpose of this toolkit is help facilities incorporate evidence-based research into their practices and measure their effectiveness. Process and outcome measures will be collected and trended.

The key to reducing HAIs is the involvement of multiple stakeholders and monitoring of the compliance with bundle elements. Listed below are the key elements of the improvement process.

- Formation of a multidisciplinary team. Members should include appropriate disciplines, such as infection prevention, nursing, quality, environmental services, pharmacy, and medical staff
- Define or map current processes
- Perform a gap analysis of bundle elements to determine what processes are routinely in place and what ones need implementation or reinforcement
- Decide next steps and who will be responsible for them
- Audit processes and give staff feedback
- Tweak processes as necessary

Implementation

Over the last several years, there have been many excellent guidelines to reduce CDI (see references). The Centers for Disease Control and Prevention (CDC), the Association of Professionals in Infection Control and Epidemiology (APIC), SHEA (Society for Healthcare Epidemiology of America), the Infectious Disease Society of America (IDSA), American College of Gastroenterology (ACG), and the American Hospital Association (AHA) are among the major societies and organizations that have published CDI reduction and Antibiotic Stewardship guidelines. Also available are many evidence-based research articles.

The common themes among the experts for reducing the transmission of *C. difficile* in a health care setting are:

- A hospital-approved policy on identifying and isolating patients with suspected or confirmed *Clostridioides difficile* infection
- Formation of an interdisciplinary team with representation from Infectious Disease, pharmacy, infection prevention, medicine, nursing, environmental services, and other departments as needed. This team should work together to develop a comprehensive plan to reduce or eliminate CDI from their facility

- Rapid identification of patients with diarrhea, appropriate isolation (including cohorting when single rooms are not available), and treatment of CDI patients

- Use of a nurse driven protocol to rapidly identify, test, and isolate patients that meet the criteria of 3 or more loose stools per day with no other reason for the diarrhea such as use of laxatives, bowel preps

- Enforcement of hand washing/hand hygiene policies. Use of gowns, gloves, and dedicated patient equipment

- Cleaning and disinfection of patient rooms and equipment using an EPA approved sporicidal agent. This would include all equipment that frequently enters and leaves a patient's room including but not limited to portable electronic devices, phones, tablet-based computers, etc.

- Assignment of cleaning and disinfection of all equipment to specific departments (e.g., environmental services, sterile processing, nursing, etc.)

- Monitoring of cleanliness in a patient's room by use of a fluorescent dye, ATP indicator or other appropriate method

Audits for compliance with CDI reduction interventions should be performed for a baseline and then every four months. For those interventions with compliance less than 80 percent, continue to audit monthly. There should be at least ten observations of patients on CDI precautions. Environmental testing of high-touch areas should be done on at least 10 patient discharge rooms (if possible) every four months.

Antibiotic Stewardship

Hospitals who have not implemented an antimicrobial stewardship program or have implemented few interventions for stewardship are encouraged to perform a CDC checklist gap analysis. This will help facilities focus efforts to improve stewardship.

Audits on antibiotic usage should be performed on a regular basis and feedback given to prescribing staff. We suggest measuring days of therapy (DOT) per 1000 patient days of fluoroquinolones (Ciprofloxacin (Cipro), Levofloxacin (Levaquin), Moxifloxacin (Avelox) and Gemilfloxacin (Factive) as well as carbapenems (Imipenem/cilastatin (Primaxin), Meropenem (Merrem), Doripenem (Doribax), and Ertapenem (INVanz). Those hospitals unable to calculate days of therapy, can calculate daily defined doses (DDD).

Measurement of Outcomes

Outcomes or infection rates and SIRs are tracked to determine the level of improvement in a hospital, hospitals of the same size, hospitals in a specific region, and hospitals statewide. CDI SIR is extracted from the NHSN data repository as well as rates per 10,000 patient days. Your data should be shared with stakeholders at your facility. Do you have higher than expected infection rates and/or SIRs? We can provide assistance in overcoming roadblocks and barriers to improvement.

Measurement of Processes

Clostridioides difficile compliance audits must include the following:

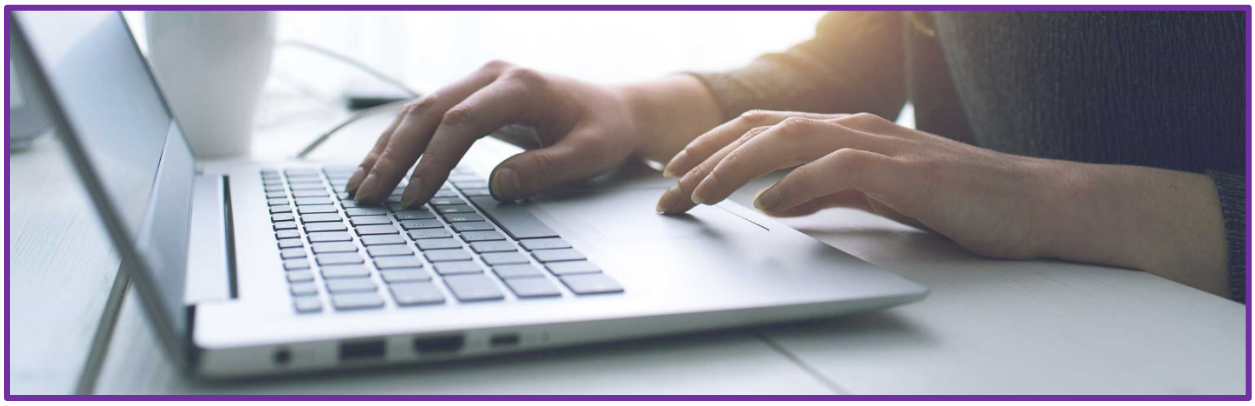
- Patient with unknown cause of diarrhea is in appropriate CDI Precautions (e.g., Contact, Enteric, etc.). Audit but no need to report
- Hand hygiene before and hand washing after leaving the room of a patient in CDI isolation precautions (you may choose either measure if you are not able to capture both)
- Use of gowns and gloves in a patient room with suspected or confirmed with CDI

Environment

- Monitoring the cleanliness of environmental surfaces and equipment (pdf list) in patient rooms through the use of fluorescent dye, ATP or other methodologies especially in units where the incidence of Hospital Onset CDI is higher. Testing should occur on discharge rooms if possible

Antimicrobial Stewardship

- Monitoring days of therapy (DOT) of fluoroquinolones and carbapenems per 1000 patient days per month
- Monitoring of daily defined doses (DDD) for fluoroquinolones and carbapenems per 1000 patient days if you are unable to collect DOT
- Instructions for calculating DDD and DOT



Education and Interactions

Hospitals will be able to participate in free learning action networks (LAN) not only on CDI and antimicrobial stewardship but also on CAUTI, CLABSI, and other topics. Emails will be sent to all hospitals notifying them of the LANs. There will also be networking and one-on-one calls available. ELearn modules on CDI identification and transmission as well as cleaning and disinfection also are available for viewing and sharing.

- CDI identification and transmission
- Cleaning and Disinfection

Websites

- Antibiotic Stewardship in Acute Care: A practical Playbook
- American Hospital Association Antimicrobial Stewardship

- American College of Gastroenterology- Guidelines for Diagnosis, Treatment, and Prevention of CDI
- Centers for Disease Control and Prevention (CDC) Antimicrobial Stewardship
- CDC Stopping CDI

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