How to Prevent Poor Patient Outcomes:

Making Your Antimicrobial Stewardship and Infection Control Program a Priority

By: Claire Bradford, MPH; Amy Hepler, RN, BSN, CIC; Abby McKnight, MPH, CPH

The Centers for Disease Control and Prevention (CDC) estimates that about 30% of all antibiotics prescribed in U.S. acute care hospitals are either unnecessary or suboptimal. The overuse of antimicrobials can cause a variety of patient complications and is a major contributor to the increase in antibiotic-resistant organisms.

Success Stories from the Field:

Admission Screening among High-Risk Patients in Acute Care to Prevent *Candida auris* Transmission

By: Julie Paoline, MA, CPHA, CIC, FAPIC

Candida auris is a multidrug-resistant yeast that causes healthcare-associated outbreaks in inpatient healthcare facilities among vulnerable patients.

These patients often require frequent hospital stays or transfers between different levels of medical care.
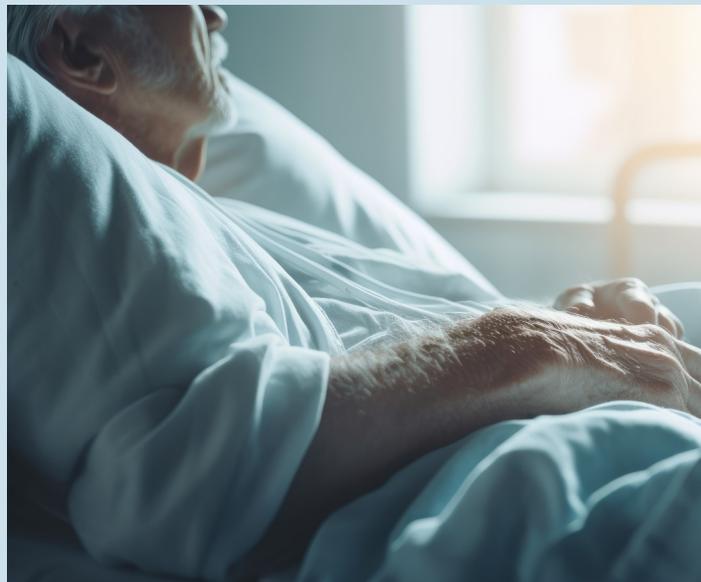
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CEs are available for nurses, nursing home administrators, pharmacists, certified health educators, and infection preventionists.

How to Prevent Poor Patient Outcomes: Making Your Antimicrobial Stewardship and Infection Control Program a Priority

In 2019, the Centers for Disease Control and Prevention estimated that there were at least 2.8 million antibiotic-resistant infections that occurred in the United States each year, and more than 35,000 people died as a result.

When *Clostridioides difficile* (*C. diff*) infection (a bacterial infection associated with antibiotic use that causes severe watery diarrhea) is included in the analysis, there are more than 3 million infections and 48,000 deaths (CDC 2019). *C. diff* infection can progress to a more serious condition called pseudomembranous colitis (Figure 1) which can then lead to toxic megacolon (Figure 2), all disease states of which can be life-threatening.

To combat the major public health concern caused by antibiotic-resistant infections, Pennsylvania law, state and federal regulations and evidence-based guidelines have been established. These efforts had been effective in reducing the percentage of deaths related to antibiotic-resistant organisms by 18% between 2013 and 2019 (CDC 2019). However, evidence suggests that the COVID-19 pandemic strained healthcare facilities and resulted in an increase in antimicrobial use and an increase in healthcare-associated, antimicrobial-resistant infections in U.S. hospitals (CDC 2022). Available 2020 data show an alarming increase in hospital-onset infections and deaths of at least 15% from 2019 to 2020 (CDC 2022). In response to these setbacks and knowing that prevention strategies have proven to be the most successful in decreasing antimicrobial-resistant infections, the U.S. continues to invest in prevention-focused public health actions (e.g., improved data collection, infection prevention and control education, wastewater surveillance, etc.) to combat antimicrobial resistance.

The Pennsylvania Medical Care Availability and Reduction of Error (MCARE) Act of 2002 was amended in 2007 to include Chapter 4, Section 403 (a)(7)(v) which requires hospitals, ambulatory surgical (outpatient) and nursing home facilities to develop and implement an infection control (IC)

plan that addresses the "appropriate use of antimicrobial agents". To comply with this MCARE element, a facility's IC plan must contain measures used to improve antimicrobial use. A key strategy used to meet this requirement is the selection and adherence to nationally recognized antibiotic prescribing guidelines. Additionally, the IC plan should contain details about the development, distribution, and use of a facility antibiogram along with an antibiotic utilization auditing process that includes sharing the analysis data with, at a minimum, the facility's IC committee.

Figure 1: *Clostridioides difficile* infection
**Pseudomembranous colitis.**
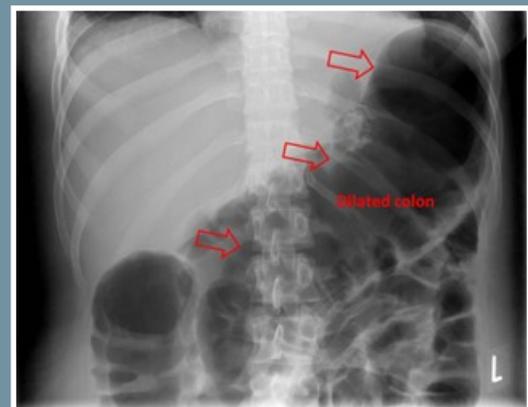
Figure 2: Toxic megacolon:
Toxic megacolon abdominal x ray.

How to Prevent Poor Patient Outcomes: Making Your Antimicrobial Stewardship and Infection Control Program a Priority *(continued from page 2)*

Hospitals and long-term care facilities (e.g., nursing homes) further need to show evidence in their IC plans on how they are meeting federal code requirements related to Centers for Medicare and Medicaid Services (CMS) Conditions of Participation of having a formal, committee-driven antimicrobial program in place. The program must be led by a qualified individual (or individuals) appointed by the facility's governing body and supported by policy and clinician/staff education to ensure successful implementation of the program.

Figure 3.
Sourced from *The Core Elements of Antibiotic Stewardship for Nursing Homes | CDC*

CDC: Core Elements of Antibiotic Stewardship Programs (applicability checkmarked by facility type)	Hospital	Outpatient	Nursing Home
Leadership commitment Demonstrate support and commitment to safe and appropriate antibiotic use in your facility	✔	✔	✔
Accountability Identify physician, nursing and pharmacy leads responsible for promoting and overseeing antibiotic stewardship activities in your facility	✔		✔
Drug expertise Establish access to consultant pharmacists or other individuals with experience or training in antibiotic stewardship for your facility	✔		✔
Action Implement **at least one** policy or practice to improve antibiotic use	✔	✔	✔
Tracking Monitor **at least one process** measure of antibiotic use and **at least one outcome** from antibiotic use in your facility	✔	✔	✔
Reporting Provide regular feedback on antibiotic use and resistance to prescribing clinicians, nursing staff and other relevant staff	✔	✔	✔
Education Provide resources to clinicians, nursing staff, residents and families about antibiotic resistance and opportunities for improving antibiotic use	✔	✔ *	✔

*The Education element for outpatient settings also includes ensuring access to needed expertise on optimizing antibiotic prescribing.

Additional Outpatient Resources

The Core Elements of Outpatient Antibiotic Stewardship (cdc.gov) [PDF – 33 pages]

Health Systems Checklist for Implementation of Core Elements of Outpatient Antibiotic Stewardship (cdc.gov) [PDF – 2 pages]

Clinician Checklist for Outpatient Antibiotic Stewardship (cdc.gov) [PDF – 2 pages]

The Core Elements of Outpatient Antibiotic Stewardship: Appendix (cdc.gov) [PDF – 23 pages]

Facility Checklist Outpatient Antibiotic Stewardship (cdc.gov) [PDF – 2 pages]

The Core Elements of Antibiotic Stewardship for Nursing Homes (cdc.gov) [PDF – 21 pages]

Core Elements of Outpatient Antibiotic Stewardship | MMWR (cdc.gov)

How to Prevent Poor Patient Outcomes: Making Your Antimicrobial Stewardship and Infection Control Program a Priority *(continued from page 3)*

The facility-wide antimicrobial stewardship program must also demonstrate coordination with the infection prevention and control and quality assurance performance improvement programs.

Antibiotic stewardship is the effort to measure and improve how antibiotics are prescribed by clinicians and used by patients. Antibiotic stewardship can be used in all healthcare settings in which antibiotics are prescribed and remains a cornerstone of efforts aimed at improving antibiotic-related patient safety and slowing the spread of antibiotic resistance (CDC. The Core Elements of Antibiotic Stewardship).

Antibiotic stewardship program guidance from CDC is available for hospital, outpatient, and nursing home settings. Although the domains and details vary slightly across these facility-specific guidelines, they all provide the framework for developing and sustaining a successful program. Figure 3 displays the core antimicrobial elements by facility setting.

CDC has additional evidence-based guidelines contained in their Adult Outpatient Treatment Recommendations website which provides the most recent recommendations for appropriate antibiotic prescribing for adults seeking care in outpatient healthcare settings.

For questions related to this article, please email the HAI Division at ra-dhhai@pa.gov.

Success Stories from the Field:

Admission Screening among High-Risk Patients in Acute Care to Prevent *Candida auris* Transmission

High-risk patients can become colonized through exposure to contaminated healthcare personnel hands, medical equipment, or environmental surfaces.

Colonization can increase a person's risk of infection. Negative consequences of infection include long hospital stays, elevated medical costs, and increased mortality.

The Pennsylvania Department of Health, Bureau of Epidemiology, Division of Healthcare Associated Infection Prevention (HAIP) promotes the importance of partnerships among public health, healthcare facilities, and laboratories to prevent and control *C. auris*. As part of our statewide containment strategy, we monitor epidemiologic trends and track the movement of persons with *C. auris* between healthcare facilities. After an experience with the admission of a person with undetected *C. auris*, one health system in southeastern Pennsylvania became interested in *C. auris* colonization screening.
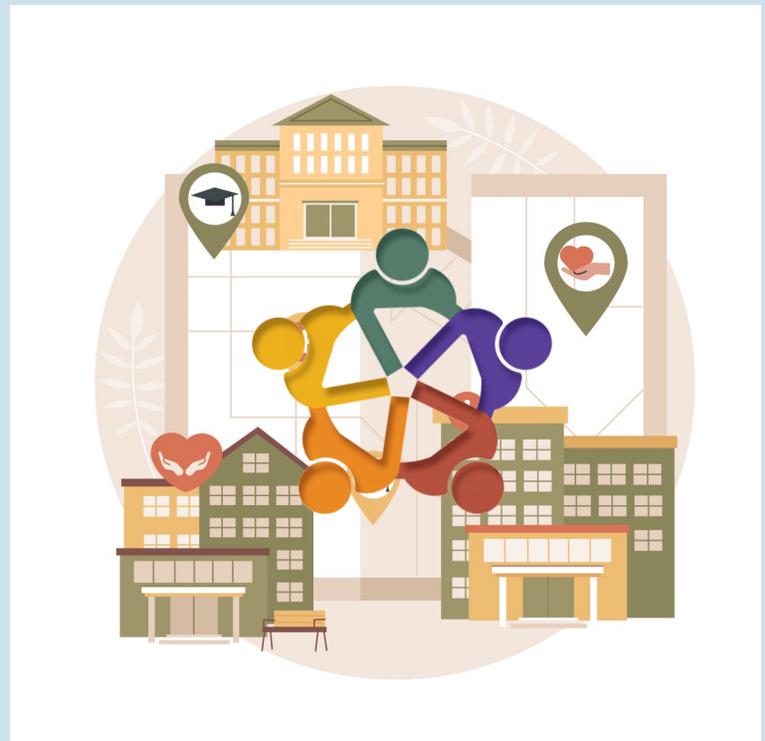
Success Stories from the Field:

Admission Screening among High-Risk Patients in Acute Care to Prevent *Candida auris* Transmission *(continued from page 4)*

Due to our outreach, the health system was inspired to collaborate with public health on a protocol to use a non-invasive screening technique. Patients targeted for screening included new admissions at high risk of *C. auris* colonization including transfers from high-acuity, long-term healthcare facilities such as ventilator-capable skilled nursing facilities and long-term acute care hospitals. Other targeted patients included those with a recent hospital stay in a facility with a known *C. auris* outbreak, or a history of colonization or infection with a carbapenemase-producing organism. Public health resources including laboratory assistance and specimen collection supplies were coordinated by HAIP through the regional antimicrobial resistance laboratory in Maryland to support this prevention activity.

As part of the admission screening protocol, anyone identified for screening would be placed on contact precautions until results of the screening were obtained. Colonized patients that are not managed on transmission-based precautions have greater potential to transmit *C. auris* to other patients; this step protects the hospital from transmission events.

During March 2022– March 2023, 86 high-risk patients were screened for *C. auris* upon admission to two acute care facilities within a single health system; 10 (11.6%) patients were found to be colonized with *C. auris*. Eight of the 10 colonized patients were entering the health system without any previous indication for transmission-based precautions. Early detection of *C. auris* on admission, and proactive contact precautions, likely prevented transmission events and protected other patients. Furthermore, six of 10 patients had a prior negative result for *C. auris*. This demonstrates that a prior negative result for *C. auris* can be misleading because a person can become colonized or infected at any time.

In addition to preventing cases of this high-concern organism, other infection prevention practices were applied as part of this prevention activity. The health system enhanced inter-facility communication by uploading *C. auris* transfer letters (available in the *C. auris* response toolkit) to their electronic medical record system. This allowed automatic notification when a patient colonized or infected with *C. auris* was transferred to another inpatient healthcare facility. Using that same technology, an electronic flag was linked to the patient's room for environmental services to ensure an enhanced terminal cleaning at discharge. Enhanced terminal cleaning included supplemental ultraviolet disinfection in addition to the standard terminal clean with Environmental Protection Agency-recommended List P disinfectants.

This partnership and the HAIP and public health laboratory *C. auris* admission screening efforts highlight that healthcare facilities are well-positioned to be proactive at preventing new introductions of multidrug-resistant organisms. Paired with the resources and subject matter expertise that public health can offer, high-concern organisms can be reduced to improve patient outcomes. As *C. auris* colonization screening expands in our state, we plan to use this successful approach as a model for other influential healthcare settings to further prevent and control *C. auris* across the Commonwealth.

CEs are available for the PA HAI Summit at TRAIN PA

The Pennsylvania Department of Health, Bureau of Epidemiology, and Philadelphia Department of Public Health jointly hosted the 2023 Pennsylvania HAI Summit from October 19 to October 20. Over the course of the two-day virtual conference, 19 esteemed speakers from a variety of healthcare and public health agencies summarized scientific advances, real-world guidance and tools, as well as Pennsylvania-specific data on healthcare-associated infections and antimicrobial stewardship.

The Summit welcomed participants from 19 states, 2 countries and 1 US Territory.

We are pleased to share that we had over 950 registrants, and our largest plenary session had over 600 participants! The most popular job title for registrants was "Infection Preventionist" followed by "Administrator/Director."

These numbers substantiate the importance of information sharing and providing up-to-date guidance for HAIs across all healthcare setting types.

If you attended the 2023 HAI Summit, continue education credits (CEs) are available for nurses, nursing home administrators, pharmacists, certified health educators, and infection preventionists.

Please follow the instructions on page 8 to claim your CE credits if you have not done so already.

The Summit issued over 1400 continuing education (CE) credit hours so far!

We thank all our wonderful speakers, moderators, planning committee members, and engaged audience members for making both days of the first Pennsylvania HAI Summit truly incredible!

Missed the Live Event?

We are pleased to announce that recorded sessions are now available in TRAIN PA. If you missed any of the original live HAI Summit, you can watch content in the recorded sessions, and obtain CE credits! Course identification numbers found in the CE credit instructions document on page 7 can be used to access the recorded sessions. CE credits are available for nurses, nursing home administrators, pharmacists, certified health educators, and infection preventionists.

Click a Link to Sign Up

Philadelphia Department of Public Health's Healthcare-Associated Infections/Antimicrobial Resistance Program Newsletter

Pennsylvania Department of Health's quarterly newsletter on reducing antimicrobial resistance through stewardship: The Steward

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CEs are available for the PA HAI Summit at TRAIN PA

Session Title	Live Session TRAIN PA Course ID	Recorded Session TRAIN PA Course ID	CEs Available
Candida auris Update: Current Epidemiology of *Candida auris* and Practical Considerations for Prevention	1113126	1114401	Nursing NHA CHES
Enhanced Barrier Precautions: Considerations for Implementation	1113122	1114399	Nursing NHA
Molecular Syndromic Panels for the Diagnosis of Infectious Diseases—Antibiotic and Diagnostic Stewardship	See instructions provided at registration		P.A.C.E.
Antibiotic Stewardship in Post-Acute and Long-Term Care Settings: Tools for Implementation	1113129	1114405	Nursing NHA ACPE
What's In Your Endoscope? Ameliorations for Patient Safety	1113120	1114397	Nursing
Respiratory Viral Infections of Public Health Interest in the Healthcare Settings	1113058	1114408	Nursing NHA CHES
An Overview of the SHEA/ISDA/APIC 2022 Updates to Strategies to Prevent Healthcare-Associated Infections Through Hand Hygiene	1113131	1114407	Nursing NHA CHES
Invasive Group A *Streptococcal* Disease: More Than Just Strep Throat	1113135	1114403	Nursing NHA
CMS Update: Antimicrobial Use and Resistance Data—NHSN Requirement for Hospitals	1113136	1114404	Nursing ACPE
Water Management Program: Reducing Risk from Water in Healthcare	1113134	1114402	Nursing NHA CHES
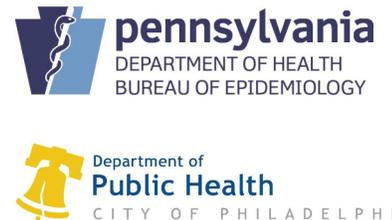
After attending the live, virtual Pennsylvania HAI Summit, follow the instructions below to claim continuing education credits (CEs)

CEs are available for the PA HAI Summit at TRAIN PA

1. If you have a TRAIN PA account,

enter your Login Name and Password and click "Log in."

2. If you do not have an account,

click on "Create an Account" and follow the instructions to set up an account and log in.

3. Once logged in, search "Courses."

Near the top of the screen, you should see "Search TRAIN", enter the course number for the corresponding session you wish to claim credits for and, press enter.
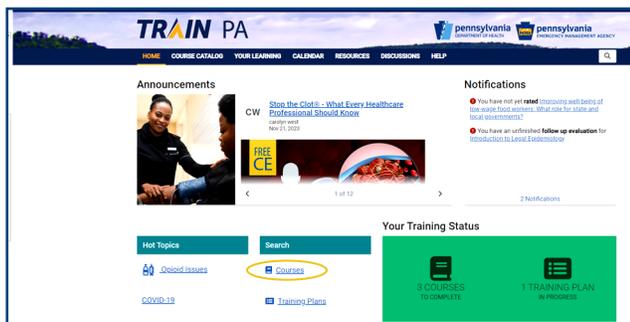
5. Click on the course name.

6. Below the course name in the upper right, click on the green box that says "Register."

+ Register   **Save For Later**

7. A pop-up box will be displayed.

Choose the type of credit that you are claiming. If you choose none, you will not receive CE credits.

8. Click on "OK."

For ACPE credits, you do not need to enter information on date of birth or NABP e-profile ID number.

9. Under the course name in the upper right, click on the green box that says "Launch."

⋮ More Actions   **> Launch**

10. Exit out of the pop-out screen.

11. Click on the green box that says, "Post-assessment". **(If this box is not available, skip to Evaluation Step.)**

12. After completing the "Post-assessment," click on the red close button in the upper right corner.

13. Click on the green box that says, "Take Evaluation", course status will change to "Evaluation Pending."

14. The evaluation for your selected CE type will be displayed.

15. After completing the Evaluation, click on the red "Close" button in the upper right corner of the screen.

16. A pop-up box will be displayed for you to submit a review. Click on your chosen number of stars, add comments, and click on the green "Post" button.

17. You will be taken back to the course registration and the status of the course will be "Completed."

18. Download and print your certificate by clicking on the blue "Print Certificate" button.

⊙ History   **+ Register**   **Print Certificate**

📖 Educational Opportunities:

Upcoming

North Carolina's Statewide Program for Infection Control and Epidemiology (SPICE) 2024 Infection Control Training opportunities for Acute Care: Infection Control Part 1: Surveillance of Healthcare-Associated Infections - Statewide Program for Infection Control & Epidemiology (unc.edu) Tentative Date April 22-25, 2024

For LTC

"Infection Control in Long Term Care Facilities" is designed to provide participants with current and practical information for prevention issues in non-acute care facilities, with an emphasis on long-term care. Basic statistics for surveillance and antibiotic stewardship are new additions to the course. Join SPICE's LTC listserv to receive course registration announcements. Tentative Date April 15-17, 2024

📅 National Health Observances

January 25, 2024
National IV Nurse Recognition Day

February, 2024
International Prenatal Infection Prevention Month

February, 2024
Sepsis Survivor Week

March 10-16, 2024
Patient Safety Awareness Week

Patient Safety Awareness Week, an annual recognition event that occurs in March, is intended to encourage everyone to learn more about health care safety. Healthcare-associated Infections are not only a problem for healthcare facilities – they represent a public health issue. Many people and organizations are working together to attack these largely preventable infections. Preventing harm in health care settings is a public health concern. Everyone interacts with the health care system at some point in life. And everyone has a role to play in advancing safe healthcare. During Patient Safety Awareness Week, the public receives educational information to better equip them in making informed healthcare decisions. For more information on how you or someone you know can be a safe patient: Patient Safety: What You Can Do to Be a Safe Patient | HAI | CDC

March 16, 2024
Squash Superbugs Day

📰 News You Can Use

Influenza Season Resource
Find current updates on respiratory illnesses on the Influenza Season Data and Respiratory Dashboard: 2023-24 Flu (pa.gov)

HICPAC's Proposed Updates to Isolation Precaution Guidelines
Check out the CDC Blog and information on Isolation Precautions Guideline Update. The next step in the process is posting on the Federal Register for public comment: Isolation Precautions Guideline Update blog posts HICPAC (cdc.gov)

Join the NHSN Group
The Joint Commission (JC) finalized their 2024 ORYX performance measure reporting requirements, effective 1/1/2024. Acute care and critical access hospitals who are JC accredited must join the "Joint Commission National Healthcare Safety Network (NHSN) group. This is to allow JC to include more recent data in their dashboards and identify quality improvement opportunities sooner. 2024 ORYX® Performance Measure Reporting Requirements include joining NHSN | The Joint Commission

Check out the recent Morbidity and Mortality Weekly Report: *Notes from the Field: Mycobacterium abscessus* Outbreak Related to Contaminated Water Among Ventilator-Dependent Residents of a Pediatric Facility — Pennsylvania, 2022 (10/20/2023), https://www.cdc.gov/mmwr/volumes/72/wr/mm7242a5.htm

To mitigate the spread and impact of MDROs, NACCHO created a series of resources on specific MDRO threats: A Primer on MDROs: *C. Auris,* ESBL, CRAB, & CRE - NACCHO

Quarterly Data Update

Antimicrobial Resistant Organisms Reported in Pennsylvania

Carbapenemase	Quarter 3 - 2023 (07/01/2023 – 09/30/2023)				
	CRE	CRAB	CRPA	No Organism*	Total by Mechanism
KPC	17	0	0	2	19
NDM	4	0	0	0	4
IMP	1	0	0	0	1
OXA-like	2	7	0	0	9
VIM	0	0	0	0	0
Carbapenemase detected by phenotype, no genotype detected	0	0	0	0	0
Total by Organism	24	7	0	2	33[†]

	Clinical	Colonized	Total
Candida auris	5	3	8

*Organisms not tested for during point prevalence survey screening   † Two cases had two carbapenemase genes

Abbreviations:
CRE=Carbapenem-resistant *Enterobacterales*
CRAB=Carbapenem-resistant *Acinetobacter baumannii*
CRPA=Carbapenem-resistant *Pseudomonas aeruginosa.*
Learn more about carbapenemases and CRE at:
CDC CRE Technical Information

*Data include all counties in PA except for Philadelphia. The counts were captured through voluntary reporting by health care facilities and laboratories, including the PA Bureau of Laboratories. Philadelphia's surveillance data, is available at https://hip.phila.gov/data-reports-statistics/healthcare-associated-infections.

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Code of Federal Regulations. Title 42, Public Health. Chapter IV, Centers for Medicare & Medicaid Services, Department of Health and Human Services. Subchapter G, Standards and Certification. Part 483, Requirements for States and Long-Term Care Facilities. Subpart B, Requirements for Long-Term Care Facilities. § 483.80, Infection Control. (a)(3) An antibiotic stewardship program that includes antibiotic use protocols and a system to monitor antibiotic use

Core Elements of Antibiotic Stewardship | Antibiotic Use | CDC https://www.cdc.gov/antibiotic-use/core-elements/index.html___Joint Commission. (2022). New and Revised Requirements for Antibiotic Stewardship. R3 Report | Requirement, Rationale, Reference, 35, 1–2.

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