Antimicrobial Stewardship Recommendations and Strategies to Improve Antibiotic Use in Nursing Homes

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Disclosures

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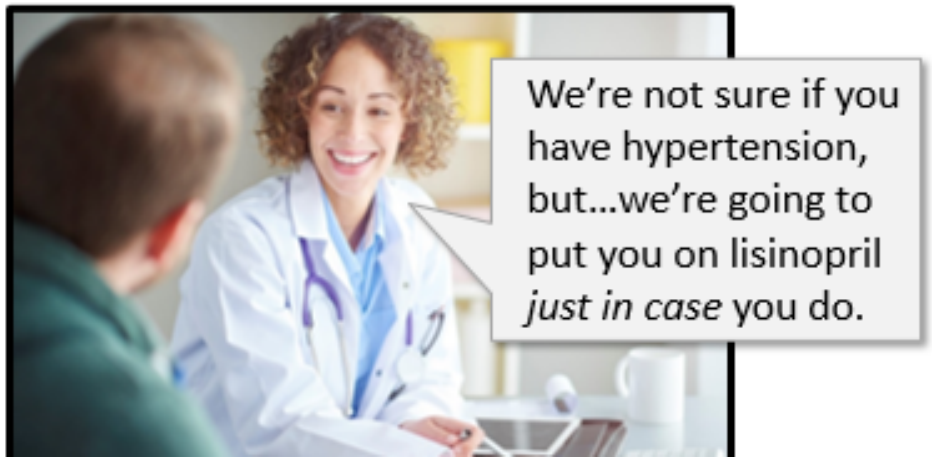
Objectives

- Describe core elements of an antibiotic stewardship programs and the related CMS regulation
- Recognize importance of tracking and analyzing data in development of a successful antimicrobial stewardship program
- Demonstrate practical steps that can be taken to implement data-driven antimicrobial stewardship program

Scope of Antibiotic Overuse

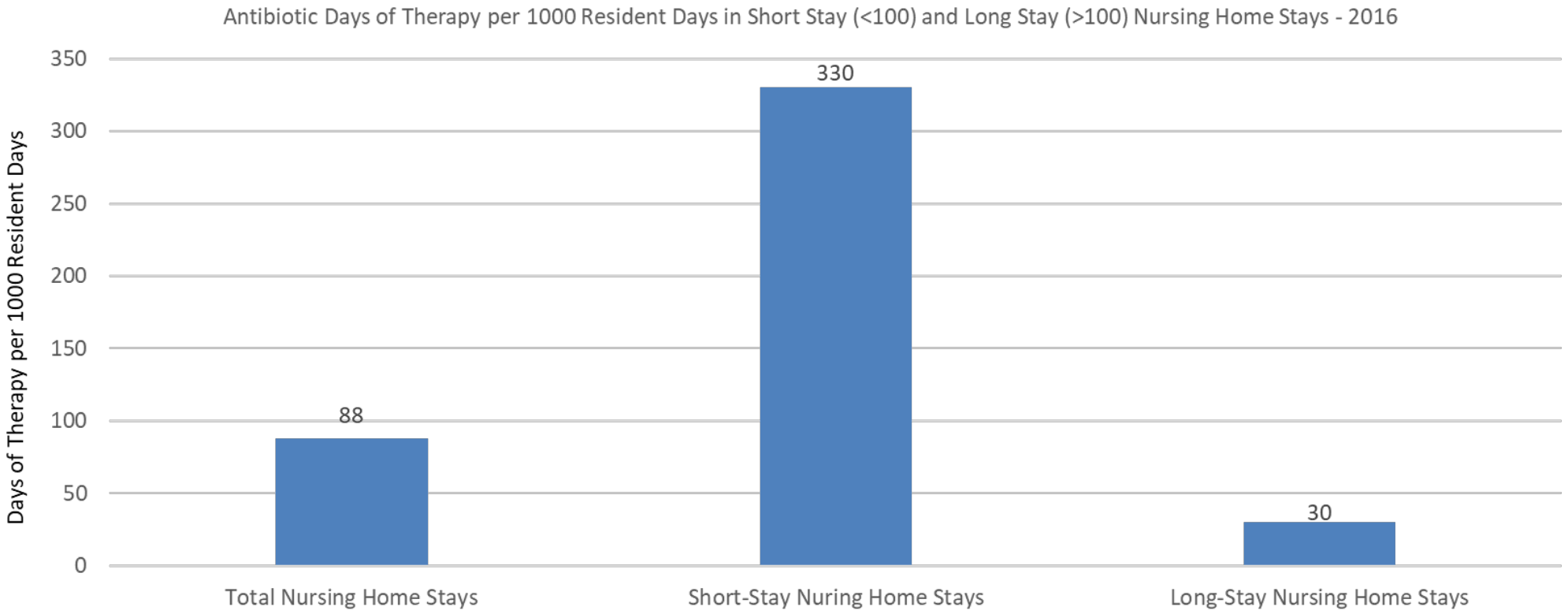
- 4.1 million Americans are admitted to nursing homes each year.
- 70% of nursing home residents will receive at least one course of antibiotics every year.
- Up to **75%** of these courses are inappropriate or unnecessary.

Imagine this scenario!



Antibiotic resistance threats in the US, 2013. (www.cdc.gov/antimicrobial-resistance/media/pdfs/ar-threats-2013-508.pdf)
Antibiotic Use in the United States, 2017: Progress and Opportunities. (archive.cdc.gov/www_cdc_gov/antibiotic-use/stewardship-report/2017.html)
AHRQ Safety Program for Improving Antibiotic Use – Long-Term Care

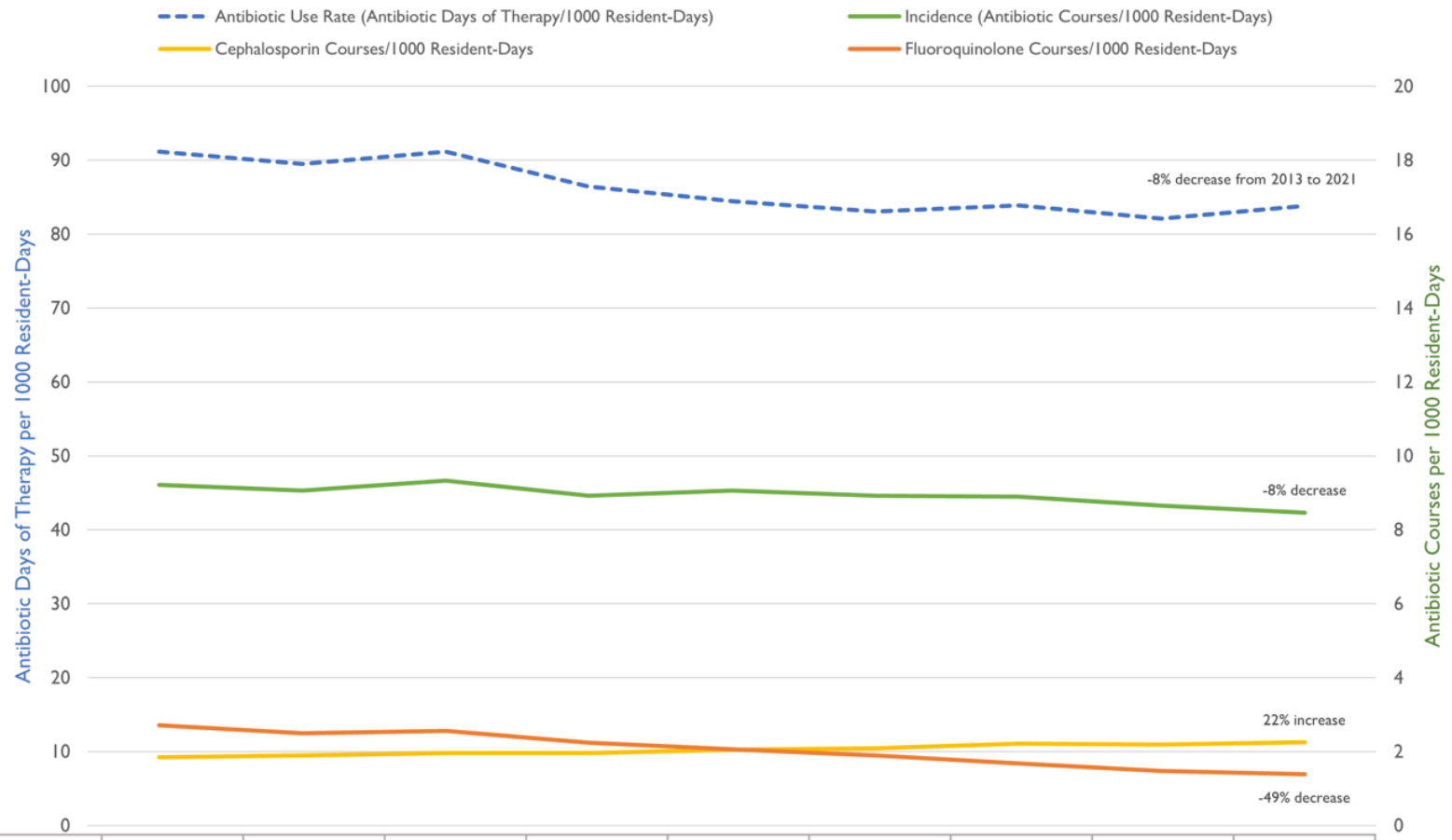
Differences in Antibiotic Use Between Short-Stay and Long-Stay Nursing Home Stays



Kabbani S et al. Antimicrob Steward Healthc Epidemiol. 2021 Dec 7;1(1):e58.

Changes in Antibiotic Prescribing - 2013 to 2021

Supplemental Figure 2. Changes in Antibiotic Use Rates in U.S. Long-term Care Facilities, 2013-2021. Source: PharMerica, a BrightSpring Health Company



Year	2013	2014	2015	2016	2017	2018	2019	2020	2021
Facilities, N	473	545	694	764	903	1,116	1,255	1,351	1,378
Residents, N	102K	120K	153k	164k	207k	279K	323K	302K	321K
Residents with Antibiotic, %	51%	50%	50%	48%	47%	47%	46%	47%	44%

Gouin K et al. Antimicrob Steward Healthc Epidemiol. 2024 Nov 21;4(1):e209.

Antibiotic Course Duration in Nursing Homes - 2021

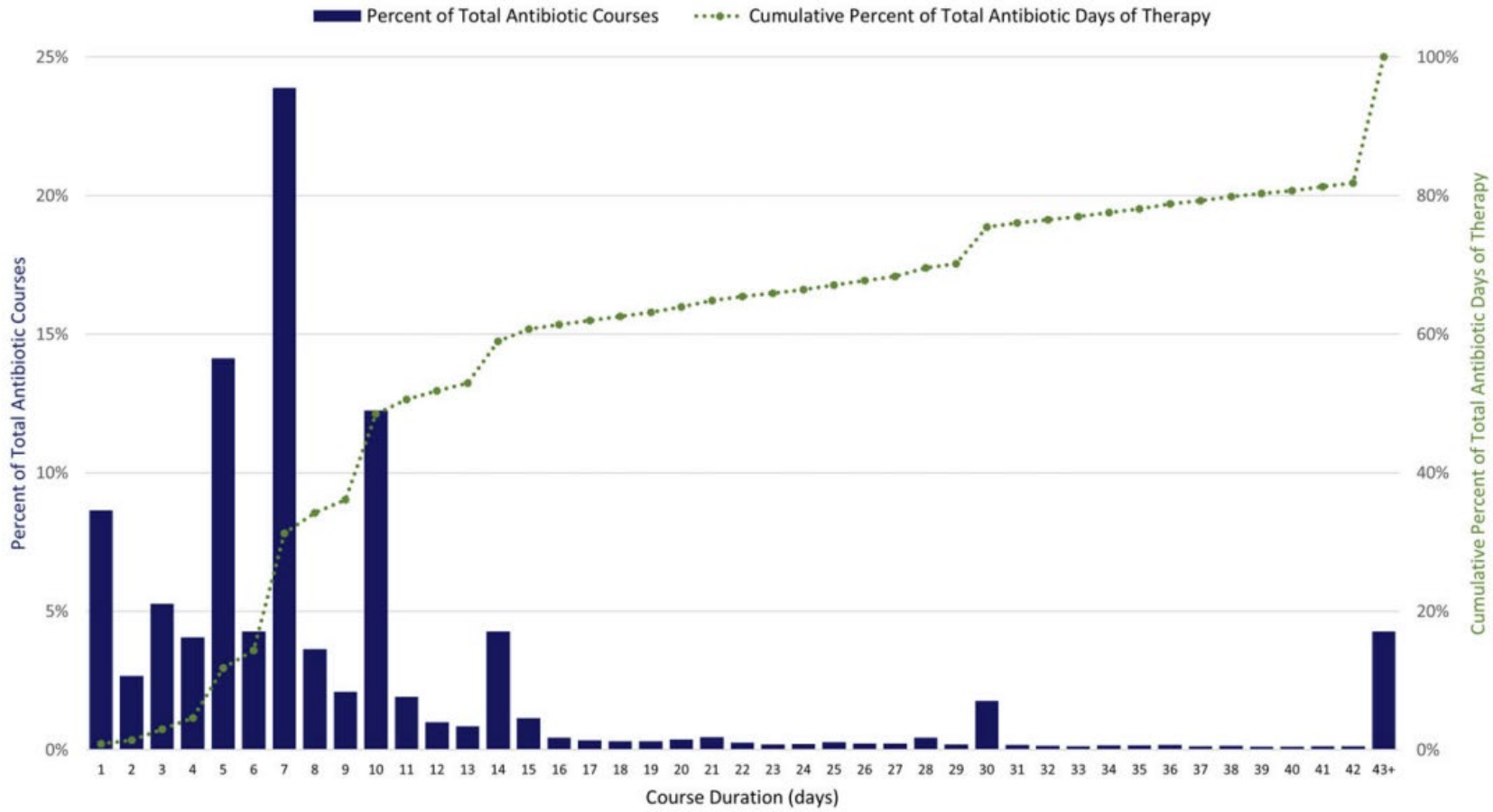


Figure 1. Distribution of antibiotic course duration and cumulative percent of total antibiotic days of therapy for 296,572 antibiotic courses in 1,378 U.S. long-term care facilities, 2021. Source: PharMercia, a BrightSpring Health Services Company.

1 to 7 days - 63%
8 to 14 days – 26%
15 to 42 days – 9%
> 42 days - 4%

Median antibiotic course duration was 7 days which was same as 2013

Gouin K et al. Antimicrob Steward Healthc Epidemiol. 2024 Nov 21;4(1):e209.

CMS Regulations for NH Antimicrobial Stewardship Program

Facility must establish an Infection Prevention and Control Program (IPCP) that includes:

- System for preventing, identifying, reporting, investigating and controlling infections
- Written standards, policies and procedures
- Antibiotic stewardship program
- System for recording incidents identified under IPCP and corrective actions taken

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Centers for Medicare & Medicaid Services

42 CFR Parts 405, 431, 447, 482, 483, 485, 488, and 489

[CMS–3260–F]

RIN 0938–AR61

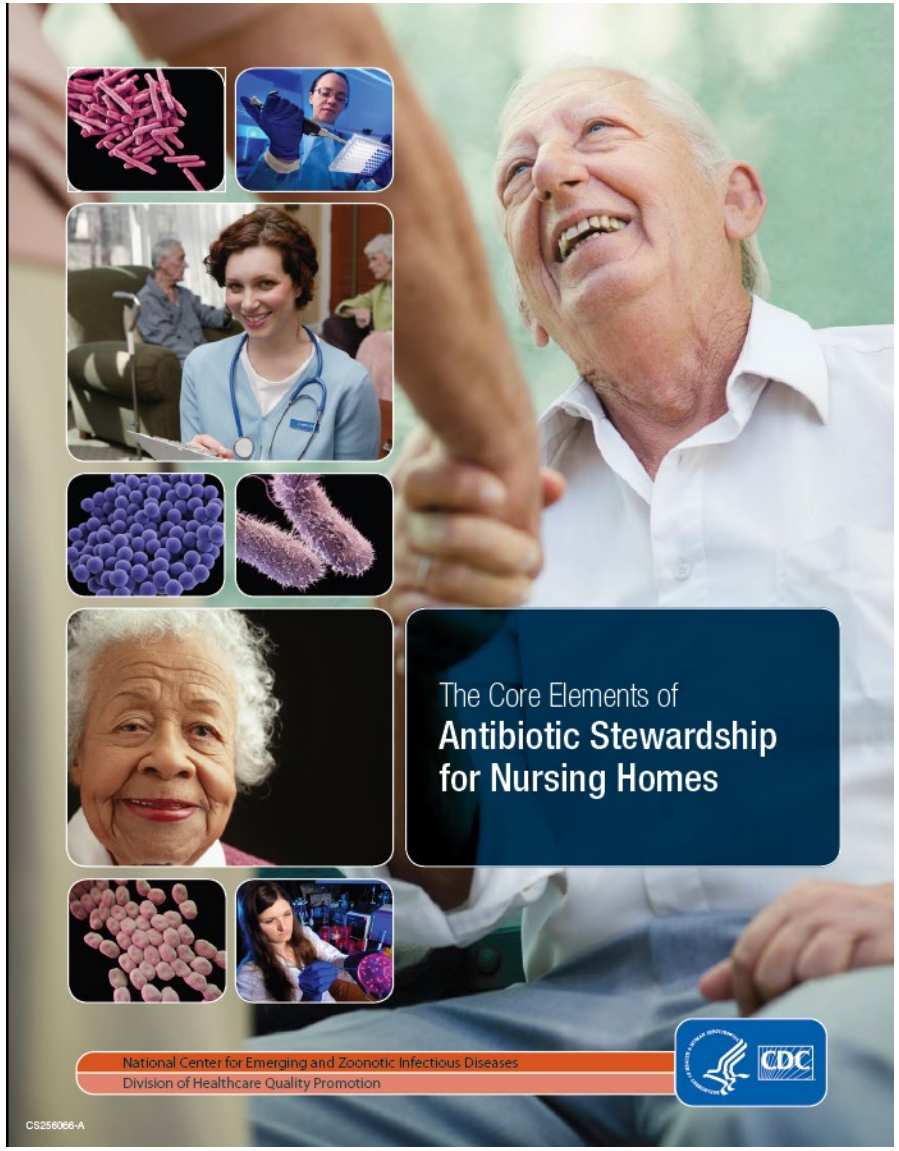
Medicare and Medicaid Programs; Reform of Requirements for Long-Term Care Facilities

AGENCY: Centers for Medicare & Medicaid Services (CMS), HHS.

ACTION: Final rule.

Medicare and Medicaid Programs; Reform of Requirements for Long-Term Care Facilities (www.federalregister.gov/documents/2016/10/04/2016-23503/medicare-and-medicaid-programs-reform-of-requirements-for-long-term-care-facilities)

Establishing ASP in Nursing Home



Summary of Core Elements for Antibiotic Stewardship in Nursing Homes

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

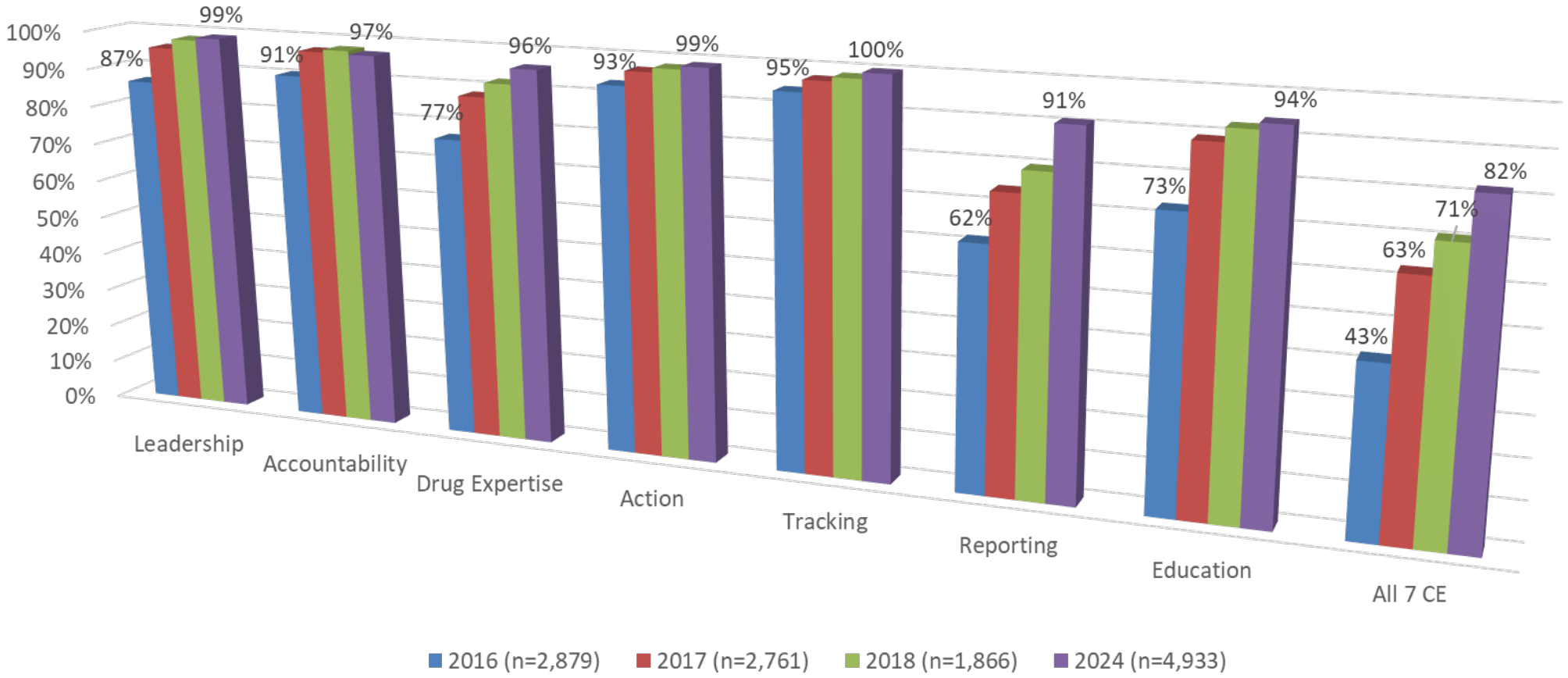
Tracking
Monitor **at least one process** measure of antibiotic use and **at least one outcome** from antibiotic use in your facility

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

CDC: Core Elements of Antibiotic Stewardship for Nursing Homes (www.cdc.gov/antibiotic-use/hcp/core-elements/nursing-homes-antibiotic-stewardship.html)

Core Element Implementation in NH



Gouin K. et al. Infect Control Hosp Epidemiol. 2022 Jun;43(6):752-756

CDC: Long-term Care Antibiotic Stewardship | A.R. & Patient Safety Portal (https://arpsp.cdc.gov/profile/ltc/united-states-United%20States)

Focus of Nursing Homes Antibiotic Stewardship Programs

What have we seen commonly in most NH:

- Individual efforts to drive stewardship program
- SBAR implementation (mostly UTI)
- Infection/Antibiotic tracking (Excel or EHR-based)
- Infection review at QAPI (# of infections and % meeting criteria)
- General education at orientation and may be annually
- Goal – meeting 7 core elements

What we have not consistently seen yet:

- Team-based stewardship program
- Data-driven action cycles
- Integrating stewardship decision making with QAPI
- Specific feedbacks to nursing staff and prescribing practitioners
- Targeted education based on identified needs
- Goal – Striving to meet data driven targeted outcomes

Antibiotic Stewardship: A Cycle of Reassessments and Readjustments

- Develop plans to address barriers
- Report/re-educate providers
- Execute mitigation plans

- Review data
- Identify opportunities
- Develop action plan
- Inform/report providers

- Analyze data
- Study outcomes
- Identify implementation barriers

- Implement Action
- Educate providers
- Track antibiotic use
- Track process measures

Take Home Message #1.

Build Antimicrobial Stewardship Program Infrastructure

Antibiotic Stewardship is a Team Effort

The facility must develop an antibiotic stewardship program which includes the development of protocols and a system to monitor antibiotic use. This development should include leadership support and accountability via the participation of the medical director, consulting pharmacist, nursing and administrative leadership, and individual with designated responsibility for the infection control program (i.e., infection preventionist).[7]

CMS: Revised Long-Term Care (LTC) Surveyor Guidance: Significant revisions to enhance quality and oversight of the LTC survey process (www.cms.gov/files/document/qso-25-14-nh-revised-2025-03-10.pdf)

2025 Multisociety Guidance for IPC in Nursing Homes
Recommendations on IPC Leadership

There should be at least one dedicated infection preventionist (IP) to manage the IPC program.

Sufficient and dedicated time for IPC duties should be based on the complexity of the resident population and services provided.

At least 1.0 FTE, if the facility has over 100 licensed beds or provides on-site ventilator or hemodialysis services

At least 0.5 FTE, if fewer than 100 beds

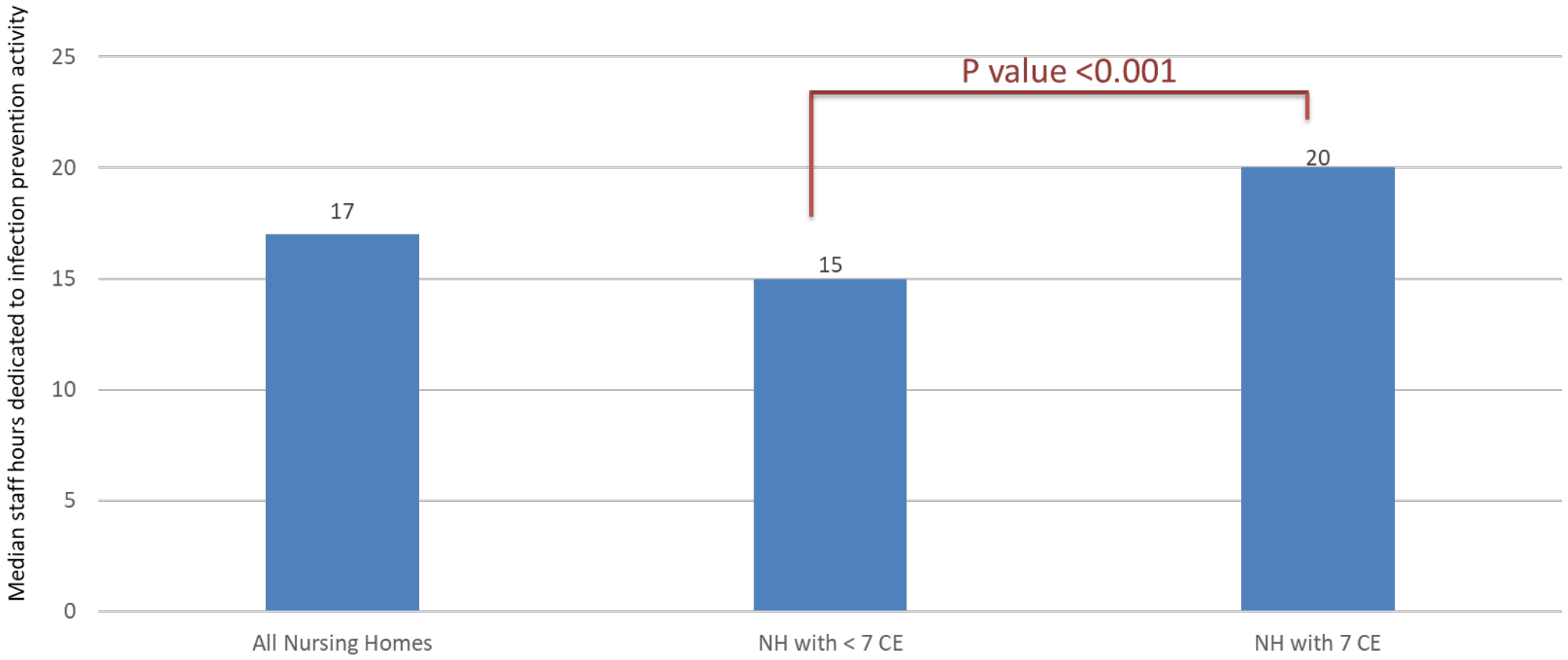
The nursing home should provide dedicated time and financial support for the IP to receive specialized training and ongoing education in IPC. Specialized training should also include topics of leadership, managing programs.

Administrative leadership, including the medical director, should actively participate in IPC program activities and provide clinical insight into protocols and processes.

Access to information technology training and infrastructure to support facility-level surveillance activities and access to public health surveillance programs.

Mody L, Advani SD, Ashraf MS et al. Infect Control Hosp Epidemiol. 2025 Nov;46(11):1069-1096

Impact of Dedicated Staff time for IPC Activities On Core Element Implementation



Gouin K. et al. Infect Control Hosp Epidemiol. 2022 Jun;43(6):752-756

2025 Multisociety Guidance for IPC in Nursing Homes
Recommendations on Antibiotic Stewardship Team

Essential Team Members:

- Infection Preventionist
- Administrative and medical leadership (including the medical director)
- Consultant Pharmacist
- Nursing Leadership

May also decide to form a dedicated antimicrobial stewardship committee:

- Can add additional team members for specific initiatives such as:
  - Physicians
  - Nurse practitioners
  - Dispensing pharmacists
  - Nurses
  - Nurse aides
  - Allied health professionals
  - Representatives nursing home's QAPI program from resident and family council

Committee functions tailored to needs and activities within nursing home (e.g., identified during facility assessments)

Stewardship Initiatives should be incorporated into the nursing home's QAPI program

Mody L, Advani SD, Ashraf MS et al. Infect Control Hosp Epidemiol. 2025 Nov;46(11):1069-1096

Delineating Roles

Medical Director

Sets the standards for antibiotic prescribing, help decide priorities

Director of Nursing

Sets the practice standards for assessing monitoring, and communicating changes in a resident's condition

Consultant Pharmacist

Supports antibiotic stewardship oversight through QI activities, reviewing medications, monitoring for adverse events, reporting use data

Infection Preventionist

Performs surveillance and data analyses to inform strategies to improve antibiotic use

Administrative leaders provide logistical support to the team

Take Home Message #2.

Integrate Antimicrobial Stewardship Intervention in Existing QAPI Processes

What Discussions Should be Taking Place at QAPI Meeting ?

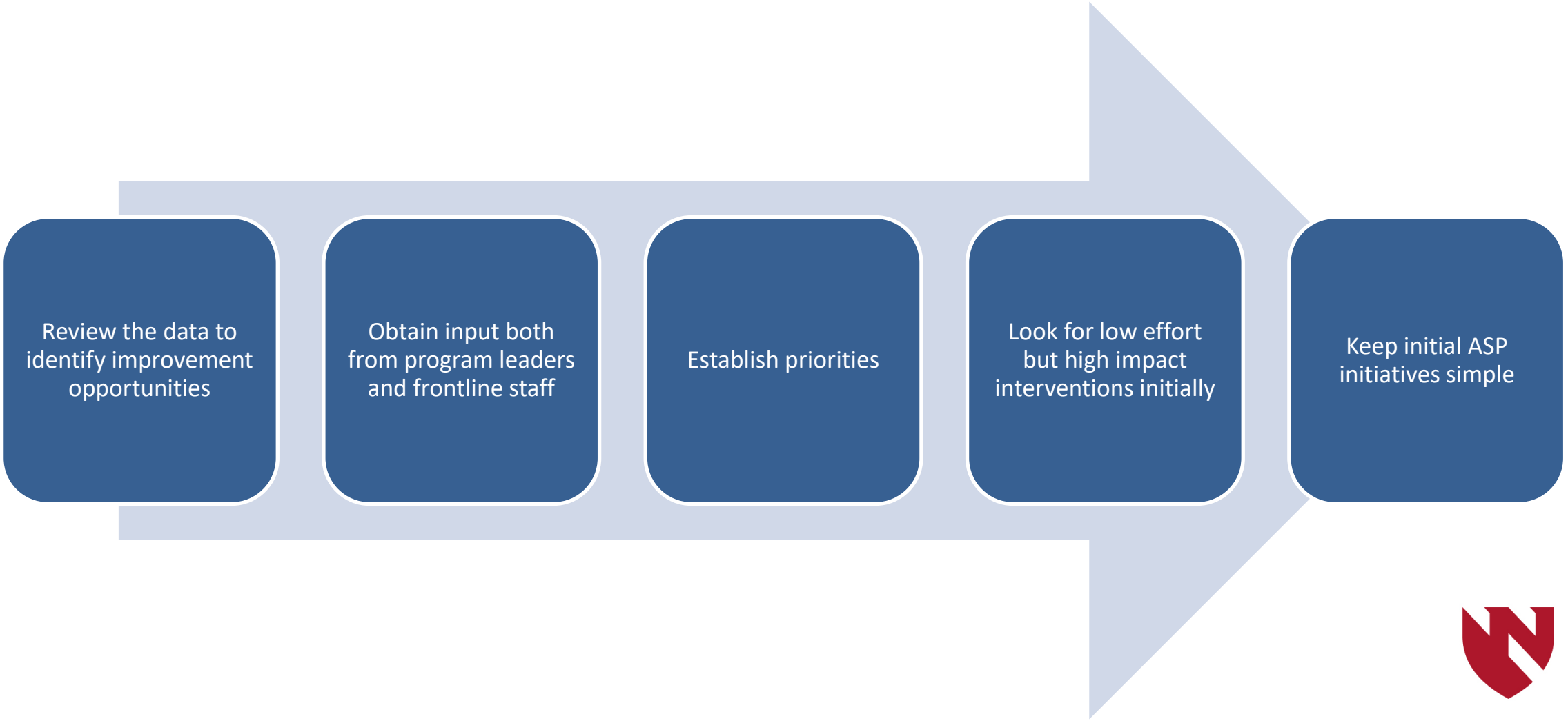
Antibiotic Use Measures	Rate
Antibiotic Starts	7.35/1000 resident days
Days of Therapy	57.51/1000 resident days

Indications	Number (%)
Urinary tract infection	39 (35)
Skin/soft-tissue infection	28 (25)
Respiratory tract infection	9
No indication	8
Pneumonia	6
Gastrointestinal infection	4
COPD	3
Fever	2
Urinary tract infection prophylaxis	2
Others	9

Most frequently used antibiotics	Number (%)
Ciprofloxacin/Levofloxacin	27 (22)
Cephalexin	26 (21)
Nitrofurantoin	18 (15)
Doxycycline	11 (9)
Others	42 (34)

Met criteria to start antibiotic– 16 (41%)
Didn't Meet criteria - 23 (59%)

Choosing Interventions



Choosing the Right Intervention

Target for Intervention	Intervention
Antibiotics being prescribed even when clinical criteria for infection are not met	• SBAR tool implementation
Diagnostic tests being sent unnecessarily	• SBAR tool implementation • Use of decision-making algorithm
Broad spectrum agent being used unnecessarily	• Develop facility-specific guidance • Implement antibiotic time-out
Bug-drug mismatches	• Antibiogram use for empiric treatment
Continuation of empiric antibiotics even after infection ruled out	• Implement antibiotic time-out
Inappropriate length of therapy	• Develop facility-specific guidance • Implement antibiotic time-out
Unnecessary antibiotics being started by outside providers	• Implement mandatory review of necessity by medical directors for all outside antibiotic orders • Implement antibiotic time-out
Unnecessary antibiotics being started by specific providers	• Consider providing specific feedback to the providers

2025 Multisociety Guidance for IPC in Nursing Homes

Recommendations on Strategies to Improve Antibiotic Use and Implement ASP Policies

- Have antimicrobial use protocols
- Implement systems for monitoring antimicrobial use.
- Provide regular feedback to prescribing clinicians on the prescribing of antimicrobials.
- Combine feedback with education to reduce inappropriate antimicrobial use in nursing homes
- Consider using peer comparison audit and feedback to make clinicians aware of their prescribing habits.
- Educate all frontline clinicians about antibiotic stewardship principles and antimicrobial use protocols

Mody L, Advani SD, Ashraf MS et al. Infect Control Hosp Epidemiol. 2025 Nov;46(11):1069-1096

2025 Multisociety Guidance for IPC in Nursing Homes

Recommendations on Implementing Diagnostic Stewardship

If possible, work with the laboratory to set up specific criteria for diagnostic testing. Examples include:

- Performing urine culture only when pyuria is present on UA
- Rejecting *C. difficile* testing on formed stool samples

Laboratories can also help with:

- Developing facility antibiogram
- Alerting facility about cultures growing targeted MDROs
- Educating HCP about sample collection and transport procedures
- Describing types of diagnostic tests
- Providing periodic reports on specific diagnostic tests, Examples include:
  - Number of urine cultures ordered and percent positives,
  - Organisms identified on cultures

Use diagnostic algorithms, clinical decision support tools, and educational interventions to assist clinicians with appropriate decision making on ordering a diagnostic test

Train HCP and conduct annual competency assessments for when and how to collect clinical specimens for diagnostic testing or culture along with transport and processing process

Mody L, Advani SD, Ashraf MS et al. Infect Control Hosp Epidemiol. 2025 Nov;46(11):1069-1096

Example of a Diagnostic Algorithm

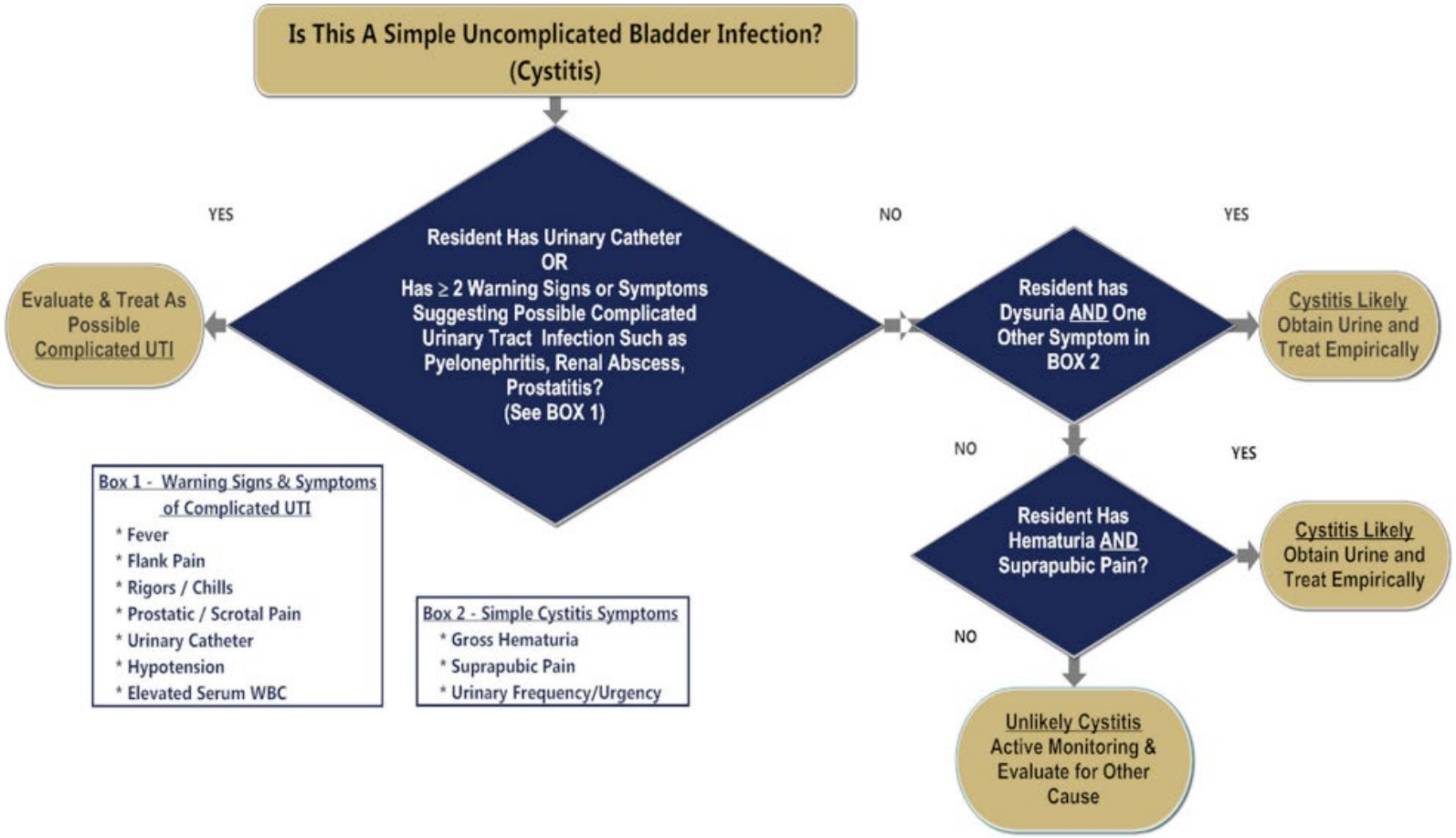


Figure 1.
Algorithm for the Diagnostic Approach to Uncomplicated Cystitis in Non-Catheterized Nursing Home Residents

Nace D et al. J Am Med Dir Assoc. 2018 Sep;19(9):765-769.e3

Tracking, Reporting and Education

What to Track

- Process measures (e.g., compliance with antibiotic use protocol)
- Antibiotic use measure (e.g., antibiotic starts and days of therapy
- Outcome measures (e.g., rates of *C. difficile* infections, antibiotic-resistant organisms or adverse drug events)

Who to Report

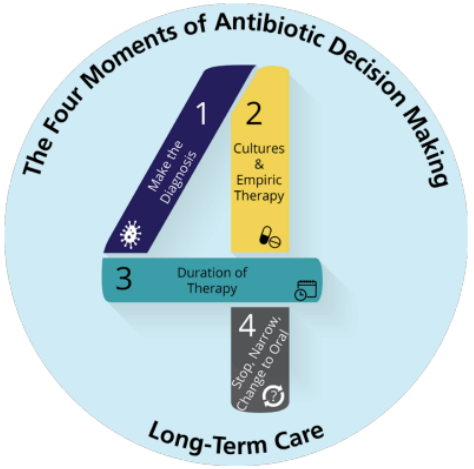
- Quality Assessment and Assurance (QAA) Committee
- Prescribing providers
- Nursing staff
- Facility leadership

Who to Educate

- Clinical providers
- Nursing staff
- Residents and families

Nursing Antibiotic Stewardship Program Toolkits

AHRQ – Agency for Healthcare Research & Quality



1 Does the resident have symptoms that suggest an infection?

2 What type of infection is it? Have we collected appropriate cultures before starting antibiotics? What empiric therapy should be initiated?

3 What duration of antibiotic therapy is needed for the resident's diagnosis?

4 It's been 2–3 days since we started antibiotics. Re-evaluate the resident and review results of diagnostic tests. Can we stop antibiotics? Can we narrow therapy? Can we change to oral antibiotics?

AHRQ Agency for Healthcare Research and Quality

AHRQ Pub. No. 17(21)-0029
June 2021

[AHRQ: Toolkit To Improve Antibiotic Use in Long-Term Care (www.ahrq.gov/antibiotic-use/long-term-care/index.html)](www.ahrq.gov/antibiotic-use/long-term-care/index.html)

Creating a Culture of Safety Around Antibiotic Prescribing

AHRQ: Create a Culture of Safety Around Antibiotic Prescribing (www.ahrq.gov/antibiotic-use/long-term-care/safety/index.html)

Take Home Message #3.

Seek Expertise and Partnerships

Strengthening Antibiotic Stewardship Programs Through Gaining Expertise and Partnerships

Building Internal Expertise	Consultant Pharmacist with specialized training in antibiotic stewardship
	Medical Director with antibiotic stewardship training and/or experience
External Consultants	Antibiotic Stewardship leads at local hospitals
	Infectious Diseases consultants in the community
Public Health/ Healthcare Partnerships	Public Health led Antibiotic Stewardship Initiatives/Consultations
	Local/Regional/National QI Collaboratives for improving antibiotic use

Experts and/or consultants may contribute towards:

- Development of antibiotic use protocols
- Process for tracking antibiotic use
- Data analyses and interpretation
- Specific feedback for further improvement
- Education of HCP, residents and families

5 Ways Consultant Pharmacists can Contribute to Antibiotic Stewardship

1. **Ensure documentation of the indication for every antibiotic order**
   - Antibiotic selection/appropriate duration during the antibiotic review process
   - Alert the provider if the indication for an antibiotic order is not documented
2. **Use the shortest effective antibiotic duration**
   - Guidelines are available for common infectious diseases
   - Contact the provider if the length of therapy exceeds the recommended duration
3. **Improve fluoroquinolone prescribing practices**
   - Due to the risk of serious adverse events, fluoroquinolones should be used only when other treatment options are unavailable
   - When possible, discuss alternatives to fluoroquinolones with providers
4. **Avoid treatment of asymptomatic bacteriuria**
   - In most cases, bacteria in the urine with no symptoms should not be treated
   - Advocate for the use of protocols to properly evaluate signs and symptoms before testing for UTI and starting antibiotics
5. **Limit the use of prolonged antibiotic prophylaxis for UTI**
   - There is no clear evidence supporting prolonged antibiotic use for prevention of recurrent UTI in nursing home residents with asymptomatic bacteriuria. Antibiotic use can cause adverse drug events and contribute to antibiotic resistance
   - Identify residents on prolonged antibiotic therapy for prevention of UTI and discuss with providers to ensure that the benefits outweigh the risks of adverse drug events

CDC: 5 Ways Consultant Pharmacists Can Be Antibiotics Aware (www.cdc.gov/antibiotic-use/media/pdfs/consult-pharm-11by17poster-main-p.pdf)

Various Ways Consultant Pharmacists Can Assist with all 7 Core Element Implementation

Core Element[2]	Suggested Actions
Leadership commitment	• Assist nursing home leadership in developing a statement of support for the antibiotic stewardship program • Provide data to leadership focused on identifying challenges, celebrating improvement, and setting up future expectations.
Accountability	• Communicate clearly about the support that consultant pharmacists need from each of the antibiotic stewardship team members • Outline responsibilities of each antibiotic stewardship team member
Drug expertise	• Serve as the antibiotic stewardship and drug expert • Prepare for this role by taking nationally available antibiotic stewardship courses, if lacking prior training or experience in antibiotic stewardship
Action	• Perform monthly medication regimen review on all antibiotics prescribed within the last month using standard review tools • Provide feedback to prescribers using standard templates • Assist nursing homes in implementing and monitoring compliance with standard protocols for evaluation and management of a resident with suspected or confirmed infection • Collaborate with nursing leaders, medical director, and other prescribers to develop local (nursing home) guidance for management of common infections • Implement processes to review culture results in real time for identifying "drug-bug" mismatches

Core Element[2]	Suggested Actions
Tracking	• Keep track of key antibiotic use, process, and outcome measures using antibiotic dispensing and/or monthly medication regimen review data. These may include: - Antibiotic starts/1000 resident-days - Days of therapy (DOT)/1000 resident-days - Percentage of prescriptions requiring feedback to prescribers - Percentage of antibiotic prescriptions associated with an adverse reaction - Rates of *Clostridioides difficile* infection and infections related to antibiotic-resistant organisms
Reporting	• Periodically provide nursing home reports on antibiotic use, process, and outcome measures that highlights progress and identifies future opportunities for improvement
Education	• Share national or local (nursing home) guidelines with prescribers and other health care workers • Arrange antibiotic stewardship-related educational sessions for nursing staff • Assist nursing homes in implementing an educational strategy based on their antibiotic use, process and outcome data

Ashraf MS et al. J Am Med Dir Assoc. 2021 Jan;22(1):6-8.

University Based Expert Team Supporting 27 Community Nursing Homes

Table 1. Components of the Antibiotic Stewardship Training and Quality Improvement Intervention

Intervention	Description/Example
Standardized system for recording antibiotic prescribing	Monthly reporting of each antibiotic start, including drug, dose, duration, and indication.
10-Module, 2-h prerecorded video training for nursing staff	Available free at https://nursinghomeinfections.unc.edu/nurses.
Two 1-h training CDs distributed to all medical providers	Included case examples of common issues in antibiotic stewardship in NHs. These are downloadable as audiocasts from https://nursinghomeinfections.unc.edu/medical-providers/.
Informative posters for nursing staff, changed on a quarterly basis	Poster topics included antibiotic stewardship, urinary tract infections, respiratory tract infections, and skin and soft tissue infections. See Supplementary Appendix S1.
Pocket information and reminder cards for nursing staff	Included SBARs for common situations,[a] common reasons for antibiotic overprescribing, and an algorithm regarding recommendations for when to obtain urine cultures. See Supplementary Appendix S1.
Pocket information and reminder cards for medical providers	Includes common reasons for antibiotic overprescribing, plus NH infection control guidelines. See Supplementary Appendix S1.
Information brochure in lay language about antibiotic stewardship for residents and families	Includes the reasons why antibiotics are sometimes not needed and the need for antibiotic stewardship. See Supplementary Appendix S1.
Quarterly quality improvement 1-page newsletters to medical providers and nursing directors and a baseline and 1-year quality improvement poster for nursing staff	Included prescribing data individually for each participating NH (with deidentified comparison data from other participating facilities). For an example, see Supplementary Appendix S1.

Systemic antibiotic prescribing rate decreased 18% from baseline by 12 month and 23% at 24 month.

No adverse events from antibiotic non-prescription were reported

Sloane PD et al. J Am Geriatr Soc. 2020 Jan;68(1):46-54.

Nebraska Public Health Collaborative to Establish NH AU Database

Nebraska Antimicrobial Stewardship Assessment and Promotion Program (ASAP) Long-Term Care Facility Antibiotic Use Tracking Collaborative Commitment Letter

An opportunity is available for Nebraska long-term care facilities to collaborate with antimicrobial stewardship experts at the University of Nebraska Medical Center and Nebraska Medicine through the Nebraska ASAP program. Nebraska ASAP is non-regulatory and is funded by the Nebraska Department of Health and Human Services Healthcare Associated Infections and Antimicrobial Resistance (HAI/AR) Program through a CDC grant. The aim of the Nebraska ASAP Long-Term Care Facility Antibiotic Use Tracking Collaborative is to provide participating long-term care facilities with both facility-specific and benchmarked state of Nebraska antibiotic use information to guide their antibiotic stewardship initiatives.

_____(Facility Name) is opting to participate in the Nebraska ASAP Long-Term Care Facility Antibiotic Use Tracking Collaborative.

As part of this collaborative, the Facility agrees to:

- Submit aggregated monthly facility antibiotic use data to the secure, online database developed by Nebraska ASAP.
  - Minimum monthly data submission will include:
    - Days of Antibiotic Therapy
    - Number of antibiotic starts
    - Total resident days
  - Optional monthly data (if chosen by the facility and pharmacist) may include:
    - Short-stay resident numbers
    - Number of infections treated in the facility by indication
    - Appropriateness of antibiotic prescriptions based on consultant pharmacist review
    - Facility antibiotic use by agent

Note: Monthly data submission can be completed by any of the facility's staff members (e.g., infection preventionist, director of nursing, administrator etc.) or their consultant pharmacist.

☐ Check this box if facility agrees to allow their consultant pharmacist(s) to submit the data on facility's behalf

Started in 2025

Currently 41 (~20% of all NH) are enrolled in this collaborative

38 facilities actively reporting

15 reporting required data

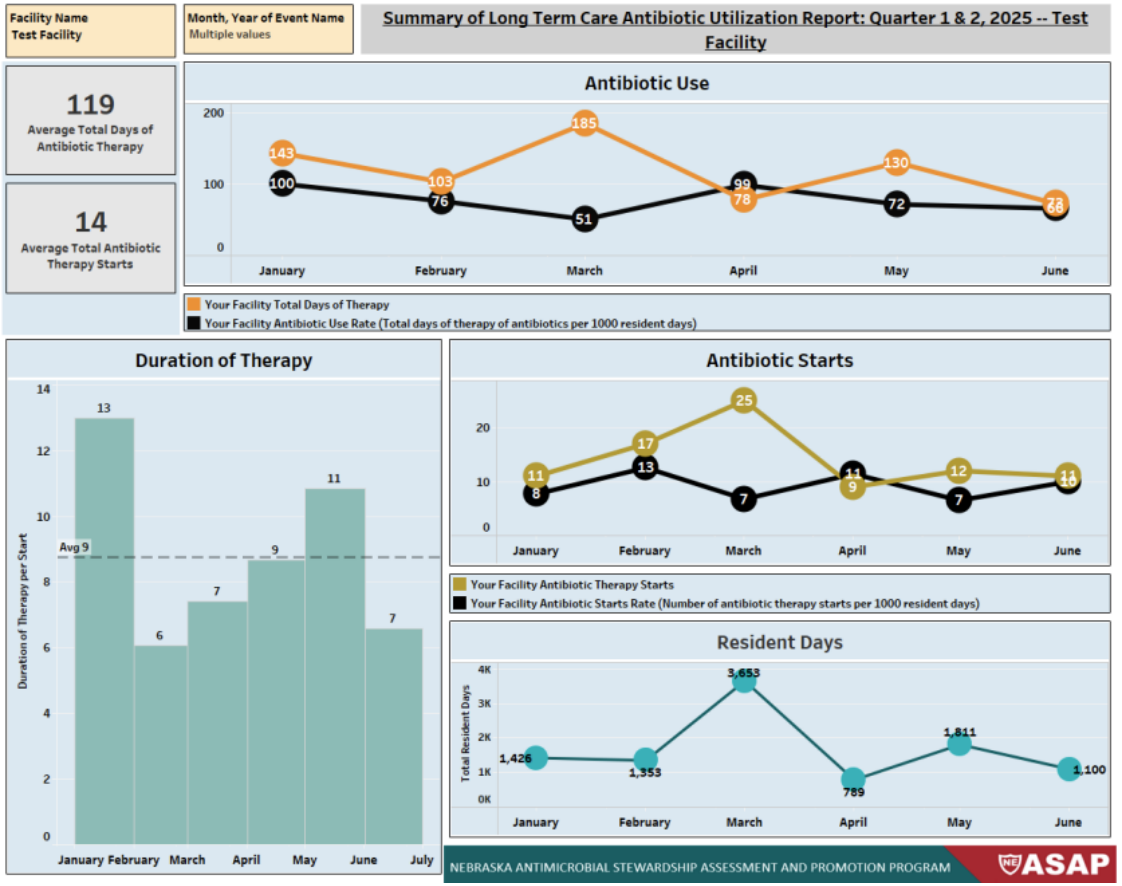
26 reporting at least some optional data; may include use of specific antibiotics

Commonly use data sources by facilities include Antibiotic use logs or EHR infection control module

Facilities receiving Quarterly Reports

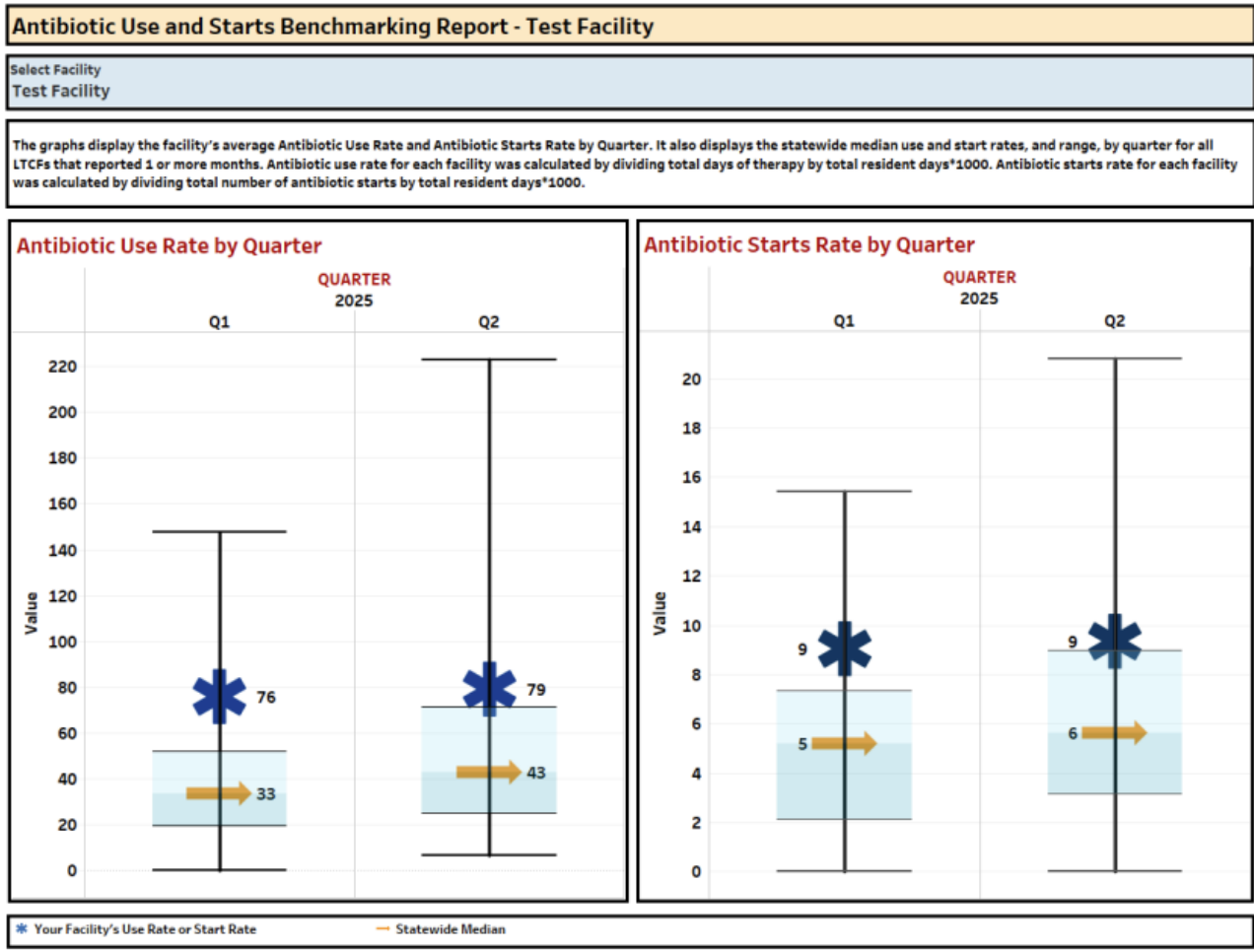
Facilities also have an option to ask for 1:1 feedback meeting

Sample Quarterly Report Received by Facilities Participating in Nebraska NH Antibiotic Use Collaborative



Facility Level Data – Page 1

Comparative Data – Page 2



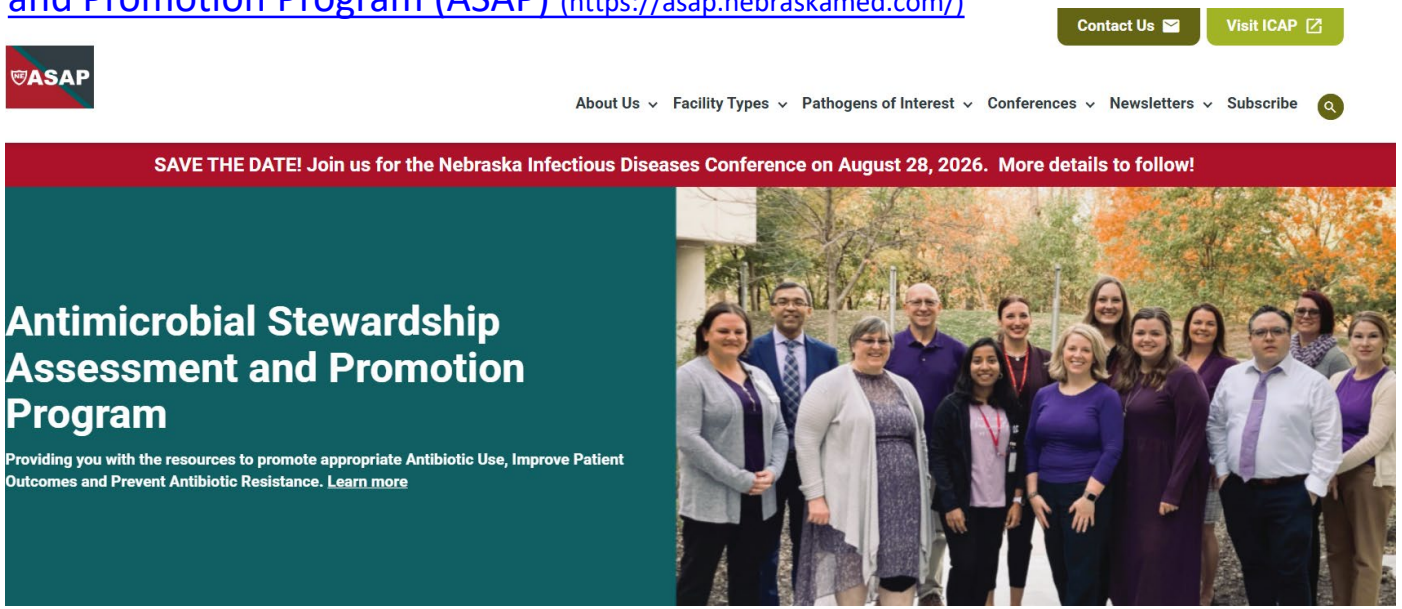
In Summary….

- Strong leadership support and dedicated time for IPC program leaders are essential
- Stewardship is a team effort, and everyone needs to play their part
- Use data to drive quality improvement initiatives through QAA committee
- Expert input and participation in collaboratives help in achieving stewardship goals
- Feedback and targeted education are essential for successful outcomes

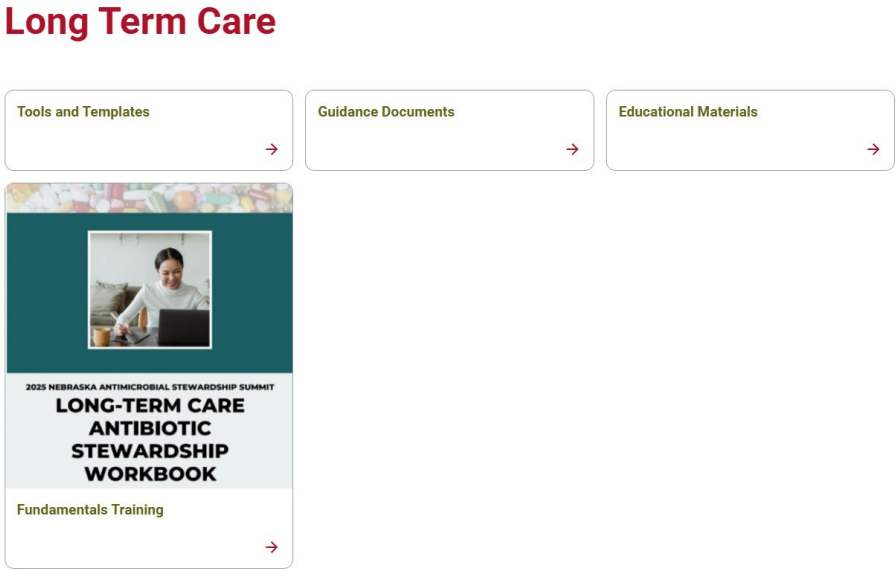
Thank You

Questions?

[Nebraska Medicine: Antimicrobial Stewardship Assessment and Promotion Program (ASAP)](https://asap.nebraskamed.com/) (https://asap.nebraskamed.com/)



[Nebraska Medicine: Long Term Care - ASAP](https://asap.nebraskamed.com/facilities/long-term-care/) (https://asap.nebraskamed.com/facilities/long-term-care/)



[Nebraska Medicine: The Antimicrobial Advocate Newsletter Archive](https://asap.nebraskamed.com/news/newsletters/) (https://asap.nebraskamed.com/news/newsletters/)