# Core Elements of Antimicrobial Stewardship in Nursing Homes

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UNMC

# Speaker Disclosures

*M. Salman Ashraf - Investigator initiated research grant from Merck & Co. Inc*

# Objectives

Understand the role infection preventionists in establishing antimicrobial stewardship program in long-term care facilities.

Recognize the steps that are required for implementing antimicrobial stewardship program in long-term care facilities

Learn various interventions to promote appropriate antibiotic use

# 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.

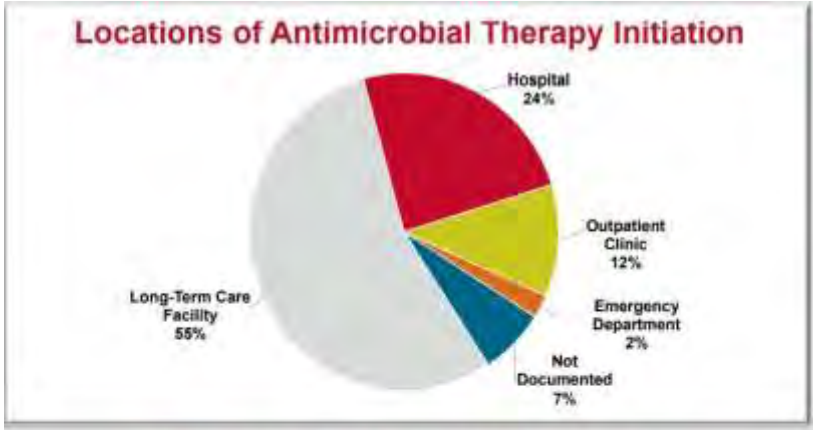

Antibiotic resistance threats in the US, 2013. www.cdc.gov/drugresistance/threat-report-2013/pdf/ar-threats-2013-508.pdf
Antibiotic Prescribing and Use in Hospitals and Long-Term Care. Apr 2017. www.cdc.gov/antibiotic-use/healthcare/
AHRQ Safety Program for Improving Antibiotic Use – Long-Term Care

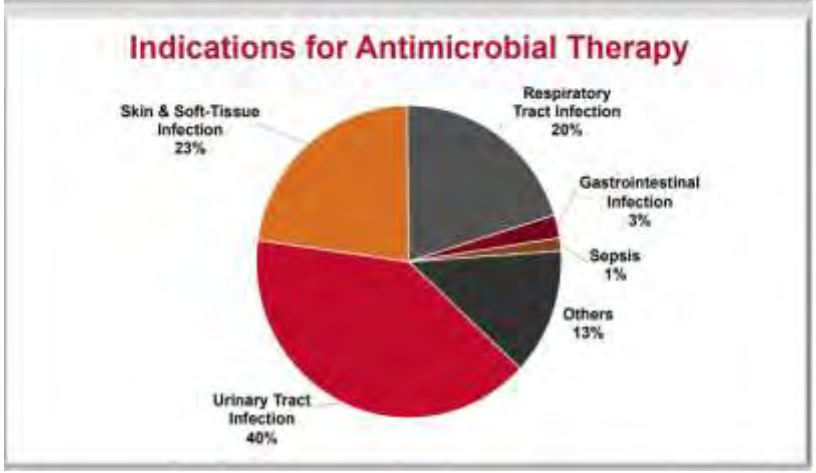
# Variations in LTCF Antibiotic Use In Nebraska Nursing Home


Chung P et al. ID week Presentation 2018

# Antibiotic Prescribing in Nebraska Nursing Homes

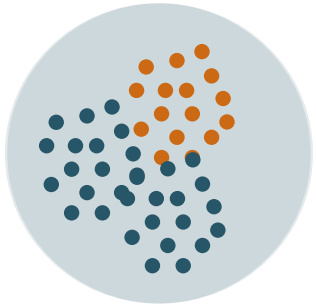
- A total of 5327 courses of antibiotic were reviewed in 32 LTCF in 2018.
- Diagnostic testing (cultures/ Xray) was associated with only 37% of the courses.
- Overall, 41% of antibiotic courses were determined to be inappropriate
- Appropriateness varied by setting:
  - Hospital: 87%
  - Emergency Department: 56%
  - LTCF: 56%
  - Outpatient clinic: 46%
- Adverse effects: 3% of courses
  - C difficile infection: 0.7%
  - Allergic reaction: 0.4%



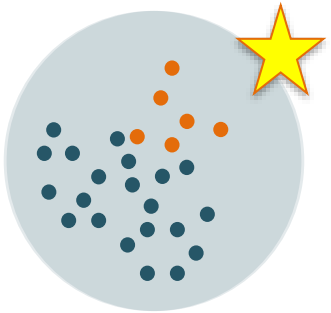

Chung et al. Open Forum Infectious Diseases, Volume 6, Issue Supplement_2, October 2019, Pages S692–S693

# How Antibiotic Resistance Happens



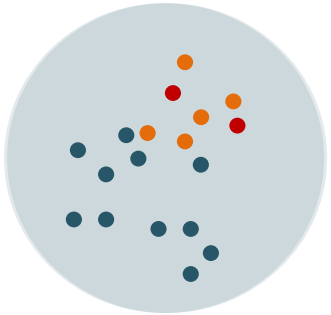
Infections start when **pathogenic** bacteria outcompete the normal flora, or **good** bacteria

*Patients receive antibiotics*



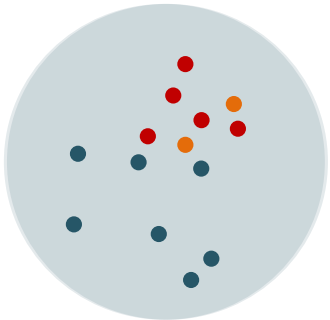
- Both **pathogenic** and **good** bacteria decrease in numbers
- Symptoms resolve

*If antibiotics are continued...*



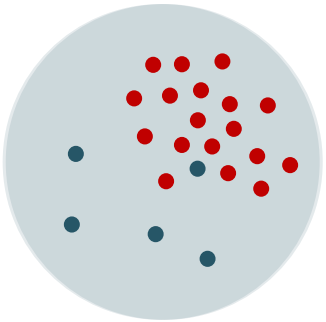
- **Good** bacteria continue to decrease in numbers
- **Pathogenic** bacteria mutate and become **resistant** to survive

*As antibiotics continue even longer...*



**Resistant** bacteria begin to multiply and share mutations with other bacteria

*When antibiotic durations are prolonged...*



- **Good** bacteria are severely reduced
- **Resistant** bacteria continue to multiply and may spread to other people or cause recurrent infection

# Why Does Antibiotic Resistance Matter?

## Limited Treatment Options

When bacteria are resistant to common antibiotics, we may need to use more expensive or less effective drugs that often have worse side effects.

## Longer Recovery Time

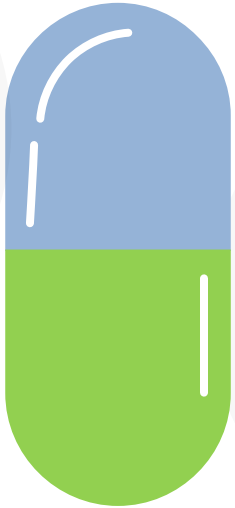
Infections that don't respond to antibiotics can lead to hospital admissions with longer hospital stays and more severe illness.

## Spread to Others

Resistant bacteria can spread to other people, creating even bigger problems in long-term care settings.

# How Common are Antibiotic-Related Adverse Events?

Antimicrobials are the 2nd most frequent cause of medication-related adverse drug events leading to emergency department visits

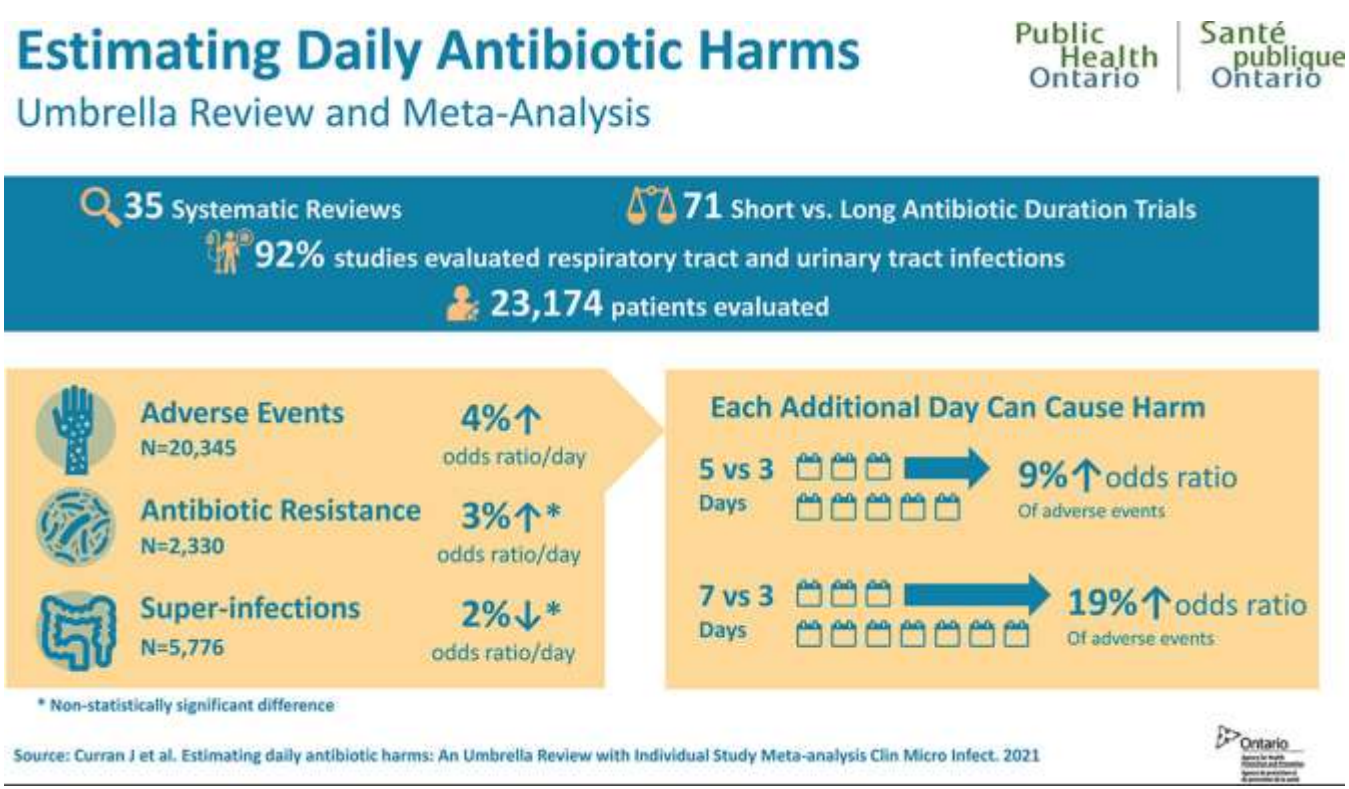


In hospitalized patients who receive
≥ 24 hours of antibiotics,

- 1 in 5 will experience an ADE
- 1 in 3 occur after hospital discharge

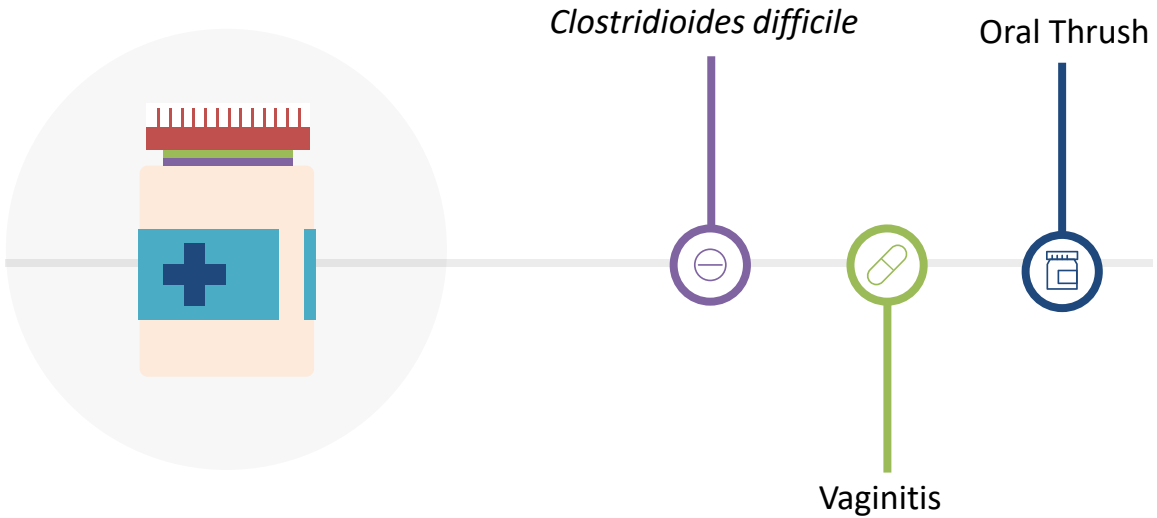
Shehab N, Lovegrove MC, Geller AI, Rose KO, Weidle NJ, Budnitz DS. US Emergency Department Visits for Outpatient Adverse Drug Events, 2013-2014. JAMA. 2016 Nov 22;316(20):2115-2125.
Tamma PD, Avdic E, Li DX, Dzintars K, Cosgrove SE. Association of Adverse Events With Antibiotic Use in Hospitalized Patients. JAMA Intern Med. 2017 Sep 1;177(9):1308-1315

# Harms Associated with Each Additional Day of Antibiotics




Curran J. *Clin Microbiol Infect*. 2022;28(4)

# Secondary Infections Due to Antibiotics




**Antimicrobials are non-selective and kill good bacteria that are protective, potentially resulting in secondary infections.**

# Social Factors Influence Antibiotic Prescribing

- Fears, risks, fatigue
- Other prescribers outside of long-term care facilities
- Communication among staff
- Resident and family pressure

Create a Culture of Safety Around Antibiotic Prescribing | Agency for Healthcare Research and Quality (ahrq.gov)

# Long Duration Treatment Influenced by Provider Preference More Than Patient Characteristics

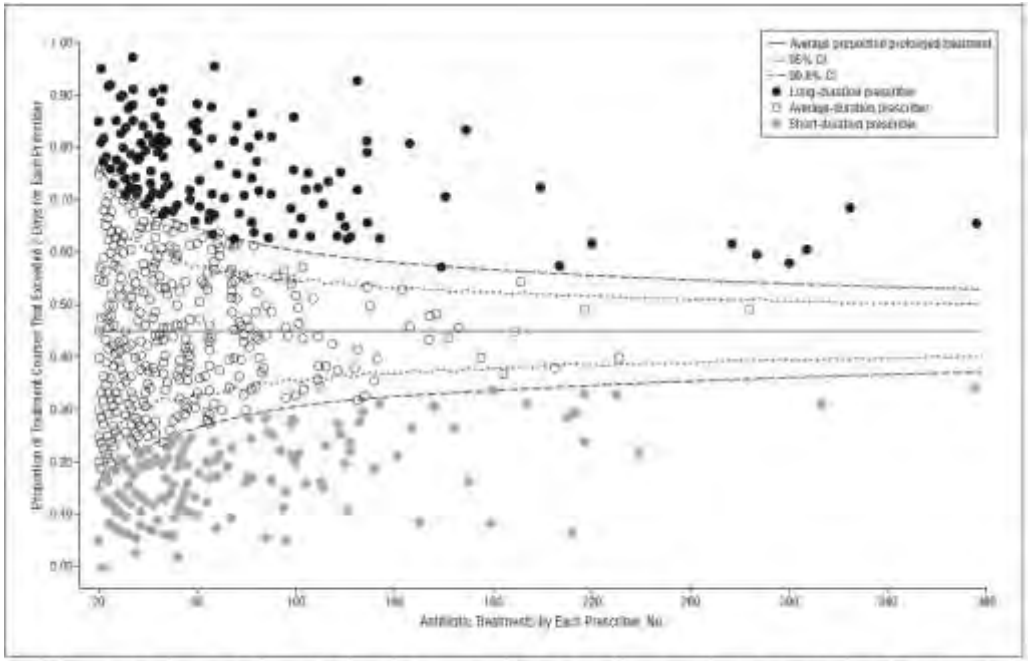
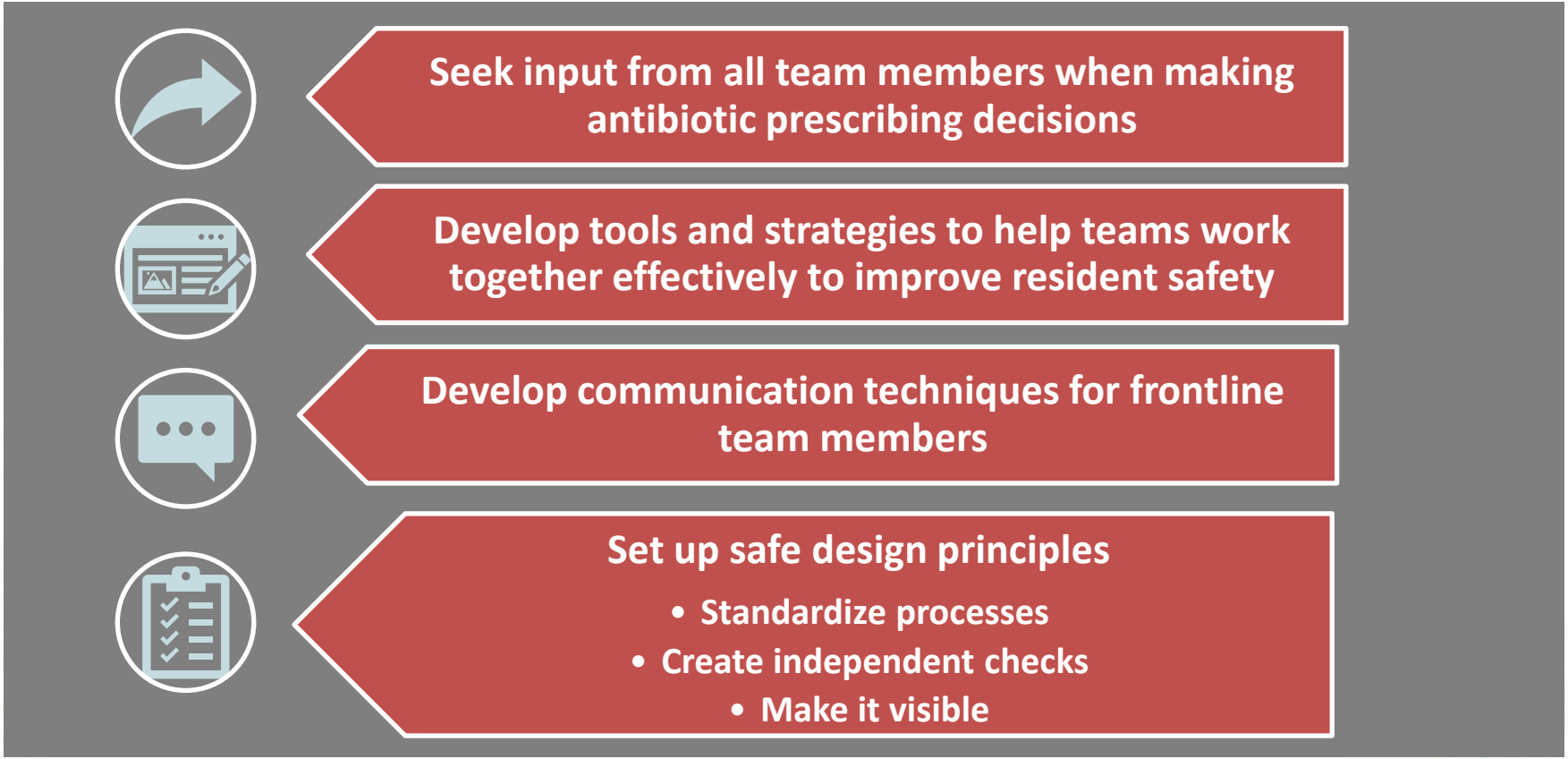



**Figure 2.** Funnel plot to determine whether variability in average treatment durations by individual prescribers is greater than can be expected by random chance. The CIs for the funnel plot are generated using exact binomial CIs for the expected proportion of treatments exceeding 7 days (standardized to the population average). Each dot indicates 1 of the 699 prescribers responsible for more than 20 individual antibiotic treatments. There were more long-duration outlier prescribers above 3-SD CIs (black dots) and short-duration outlier prescribers below 3-SD CIs (gray dots) than expected by random chance.

# Creating a Culture of Safety Around Antibiotic Prescribing




Create a Culture of Safety Around Antibiotic Prescribing | Agency for Healthcare Research and Quality (ahrq.gov)

# Critical Focus Areas for Sustainability of ASP in LTCF

- Explicit leadership support
- Partnerships with an external AS expert
- Fostering internal interprofessional collaborations
- Consistent education and training

Seshadri S et al. Infection Control & Hospital Epidemiology, 42(4), 440-447

# 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.

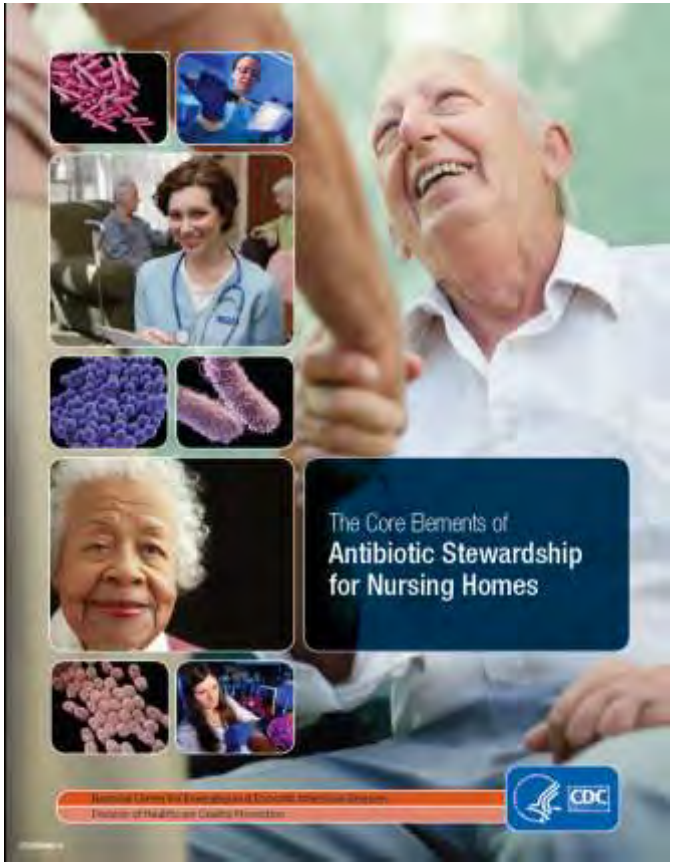
https://www.federalregister.gov/documents/2016/10/04/2016-23503/medicare-and-medicaid-programs-reform-of-requirements-for-long-term-care-facilities

# 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).

REVISED: Revised Long-Term Care (LTC) Surveyor Guidance: Significant revisions to enhance quality and oversight of the LTC survey process

# Establishing ASP in Nursing Home





Core Elements of Antibiotic Stewardship for Nursing Homes | Antibiotic Prescribing and Use | CDC

# Core Element #1: Leadership Commitment

- Written statement of support for an antimicrobial stewardship program
- Outline duties of the ASP team members
- Communicate expectations with the nursing staff and prescribing providers
- Create culture that promote appropriate antibiotic use

# Engaging Your Leadership

- Make sure you clarify requests
  - What exactly is your team asking for?
- Be specific
- Be prepared
- Have evidence to support your requests
  - What is the magnitude of the problem?
- Anticipate obstacles and solutions
  - Time
- Give a reasonable time frame to address your concerns

[Facility Logo]

**FROM:** [Executive Director, Medical Director, Director of Nursing, etc.]

**DATE:** [Date]

**RE:** Antimicrobial Stewardship Program

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Antibiotics are among the most commonly prescribed medications within long-term care facilities. However, misuse of antibiotics can lead to undesirable outcomes including emergence of multidrug resistant pathogens, development of *Clostridium difficile* infections, adverse drug reactions, increased mortality, and higher costs.

As part of the continuing commitment to provide high quality care to all our residents, the leadership team of [facility name] has created an Antibiotic Stewardship Program (ASP). This program will promote appropriate use of antibiotics in our facility. The overall goal of ASP is to prevent undesirable outcomes related to antibiotic misuse by optimizing the selection of drug, dose, route, and duration of therapy. Antibiotic use protocols and systems to monitor antibiotic use will be implemented to achieve ASP goals.

The ASP will be a part of the facility's Infection Prevention and Control Program. Infection preventionist will play a central role and the key leaders accountable for the program include [Medical Director, Director of Nursing, Consultant Pharmacist, etc.]. This multidisciplinary team will regularly review appropriateness of antibiotic courses and make recommendations for adjustment in practice where necessary, establish new or revise existing protocols relevant to appropriate antibiotic prescribing, monitor and report patterns of antibiotic use and resistance; and provide education on responsible use of antibiotics.

The success of this initiative requires the full participation and support of those who prescribe, prepare, administer, and receive antimicrobial therapy. The facility will provide adequate staffing and resources to support the functions and goals of the ASP. ASP team will engage prescribing providers, staff, residents, and residents' families to ensure that antibiotic use protocols can be implemented smoothly. Facility leadership is confident that with the help of frontline staff, support of prescribing providers, understanding of resident and families, and guidance of ASP team, we will improve quality of care and minimize untoward consequences of antibiotic therapy.

# Sample Leadership Support Statement

Tools and Templates for Long Term Care - ASAP (nebraskamed.com)

# Core Element #2:  Accountability

Empower leaders of the program

Medical Director, Director of Nursing, Consultant Pharmacist, IP

Provide dedicated time for ASP activities

Make the team accountable

Develop partnerships with consultant laboratory, local and state health departments, and Nebraska ASAP

# Antibiotic Stewardship Committee/Team

Required Committee Membership

- Infection Preventionist
- Medical Director or a designated lead physician
- Director of Nursing or Assistant Director of Nursing
- Consultant Pharmacist

Optional Committee Membership

- Administrator
- Prescribing Provider (Attending Physician, Nurse Practitioner or Physician Assistant)
- Nurse representative
- Nurse Aid representative
- Allied Health Professional
- Representative from the Resident and Family Council

Committee should meet **at least quarterly**, and review policy/program annually and as needed

# 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

# Developing an Antibiotic Stewardship Policy


Special Article

## Template for an Antibiotic Stewardship Policy for Post-Acute and Long-Term Care Settings

Robin L.P. Jump MD, PhD [a,b,*], Swati Gaur MD, MBA, CMD [c], Morgan J. Katz MD [d], Christopher J. Crnich MD, PhD [e,f], Ghinwa Dumyati MD [g], Muhammad S. Ashraf MBBS [h], Elizabeth Frentzel MPH [i], Steven J. Schweon RN, MPH, MSN, CIC, HEM [j], Philip Sloane MD, MPH [k], David Nace MD, MPH, CMD [l] on behalf of the Infection Advisory Committee for AMDA—The Society of Post-Acute and Long-Term Care Medicine

[Facility Logo]

| | |
|---|---|
| **SUBJECT:** | **Antimicrobial Stewardship Program** |
| **POLICY NO.:** | [Policy number] |
| **EFFECTIVE DATE:** | [Policy effective date] |
| **LAST REVISION DATE:** | [Date of last policy revision] |
| **RELEVANT REGULATION:** | CFR § 483.80(a)(1)-(4) |
| **APPROVED BY:** | [Approving individual or committee] |

**Policy Statement:**
The goal of the Antimicrobial Stewardship Program (ASP) is to promote the appropriate use of antimicrobials in order to maximize treatment outcome and minimize unintended consequences of antimicrobial therapy. The ASP aims to improve antibiotic prescribing practices through the development and implementation of antibiotic use protocols and a system to monitor antibiotic use.

**Structure:**
The Antimicrobial Stewardship Committee has been established to provide support and oversee activities of the ASP. This committee and the ASP will be part of the Infection Prevention and Control Program (IPCP). The IPCP will directly report all ASP-related activities and outcomes to the Quality Assurance and Performance Improvement (QAPI) Committee. QAPI Committee will in turn report all ASP activities and outcomes to nursing staff, prescribing clinicians, and other relevant staff.

**Procedure:**
1. Membership of the Antimicrobial Stewardship Committee
   a. Medical Director (required)
   b. Director of Nursing (required)
   c. Infection Preventionist (required)
   d. Consultant Pharmacist (required)
   e. Additional member as deemed appropriate by the Antimicrobial Stewardship Committee which may include Nurse representative, Nursing Aide representative, QAPI Director, Administrator or other healthcare workers

2. Meetings
   Antimicrobial Stewardship Committee will meet at least quarterly to review ASP-related activities and outcomes. The committee will also report its activities along with antibiotic use and resistance data to QAPI Committee at least on an annual basis.

3. Responsibilities
   a. Ensure appropriate use of antimicrobials through development and implementation of institutional policies, procedures, treatment algorithms, or other relevant initiatives

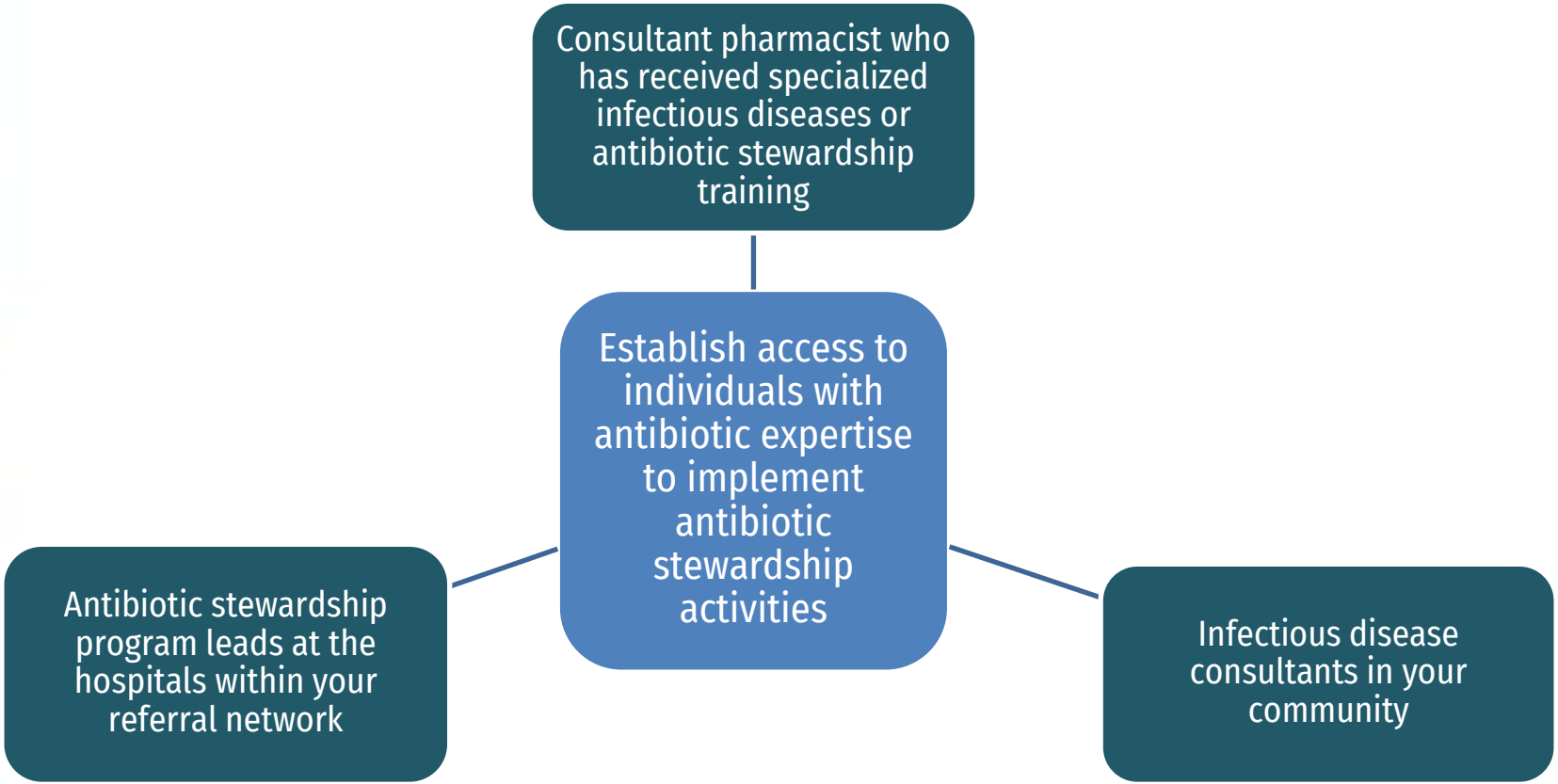




   b. Monitor facility antimicrobial use, antimicrobial resistance patterns, and compliance to ASP-related processes
   c. Report outcomes of ASP activities to QAPI Committee and healthcare workers
   d. Identify opportunities for improvement in facility antibiotic prescribing practices along with developing and implementing action plans to make these improvements
   e. Provide education to healthcare workers, residents and families on appropriate use of antimicrobial agents

A summarized modifiable version was developed by Nebraska ASAP and template is available at: https://asap.nebraskamed.com/long-term-care/tools-templates-long-term-care/

# Core Element 3: Drug Expertise



# Consultant Pharmacist

**The Antibiotic Stewardship Program in Relation to Pharmacy Services**

The assessment, monitoring, and communication of antibiotic use shall occur by a licensed pharmacist in accordance with §483.45(c), F756, Drug Regimen Review. A pharmacist must perform a medication regimen review (MRR) at least monthly, including review of the medical record and identify any irregularities, including unnecessary drugs.

REVISED: Revised Long-Term Care (LTC) Surveyor Guidance: Significant revisions to enhance quality and oversight of the LTC survey process

# 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

5 Ways Consultant Pharmacists Can Be Antibiotics Aware

# 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<br>• 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<br>• Outline responsibilities of each antibiotic stewardship team member |
| Drug expertise | • Serve as the antibiotic stewardship and drug expert<br>• 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<br>• Provide feedback to prescribers using standard templates<br>• Assist nursing homes in implementing and monitoring compliance with standard protocols for evaluation and management of a resident with suspected or confirmed infection<br>• Collaborate with nursing leaders, medical director, and other prescribers to develop local (nursing home) guidance for management of common infections<br>• Implement processes to review culture results in real time for identifying "drug-bug" mismatches |
| Tracking | • Keep track of key antibiotic use, process, and outcome measures using antibiotic dispensing and/or monthly medication regimen review data. These may include:<br>- Antibiotic starts/1000 resident-days<br>- Days of therapy (DOT)/1000 resident-days<br>- Percentage of prescriptions requiring feedback to prescribers<br>- Percentage of antibiotic prescriptions associated with an adverse reaction<br>- 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<br>• Arrange antibiotic stewardship-related educational sessions for nursing staff<br>• 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.

# Summarizing the First Three ASP Core Elements

- Form an antibiotic stewardship committee/team
- Define responsibilities and goals of the committee
- Provide protected time to achieve the goals
- Establish antibiotic stewardship team meetings
- Develop antibiotic stewardship policy
- Inform prescribers and nursing staff about their roles and goals of the antibiotic stewardship program
- Build relationships with regional antibiotic stewardship experts or facilitate training of committee member on antibiotic stewardship

- ✓ Leadership commitment
- ✓ Accountability
- ✓ Drug Expertise

# Core Element #4: Action

- Policies that support optimal antibiotic use
- Broad interventions - Infection evaluation & communication
- Infection and syndrome specific interventions
- Pharmacy interventions

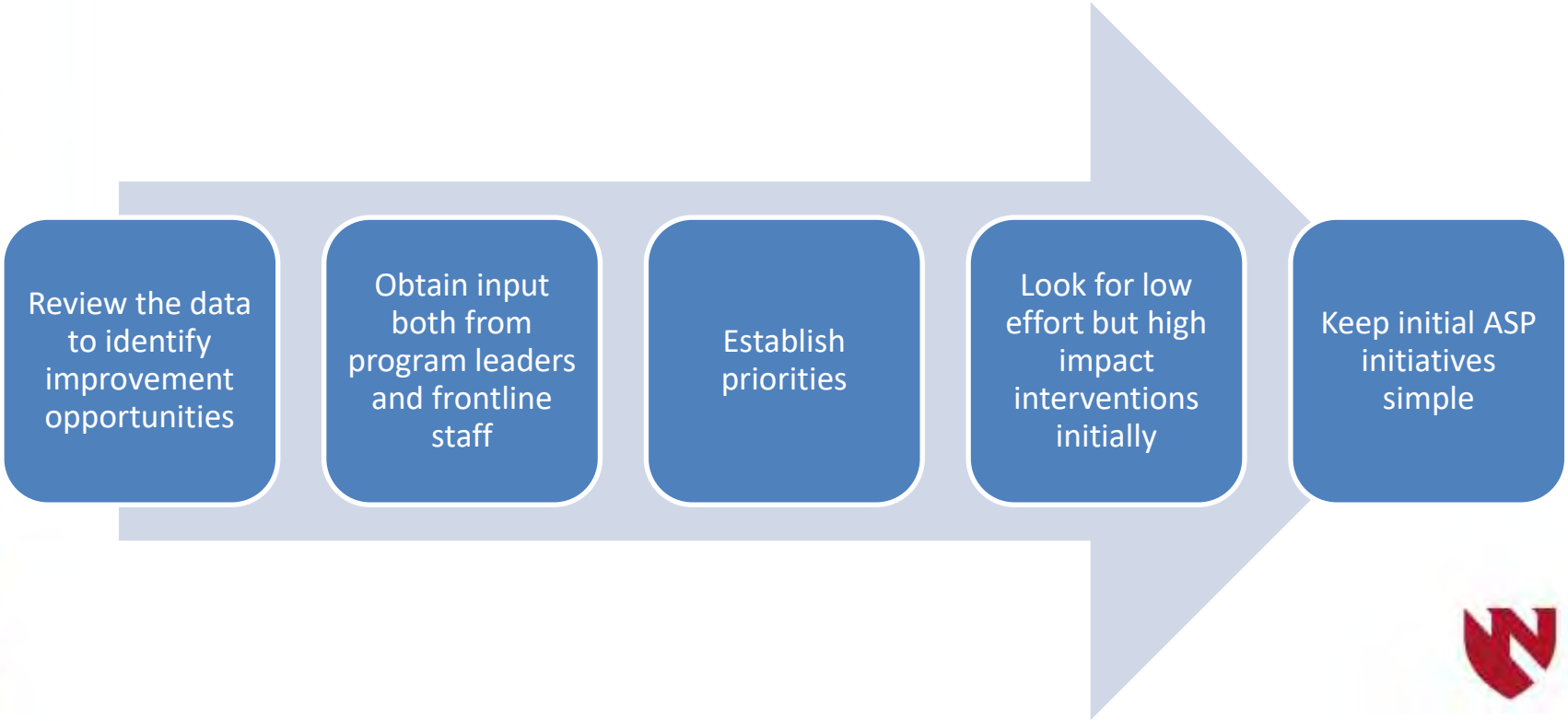
Broad interventions - Infection evaluation & communication:

- Algorithms for resident assessments
- Communication tools
- Antibiotic-time outs
- Guidelines
- Provider feedback

# Program Toolkits
# AHRQ – Agency for Healthcare Research & Quality


Toolkit To Improve Antibiotic Use in Long-Term Care | Agency for Healthcare Research and Quality (ahrq.gov)

# Choosing Interventions



# Core Elements 5, 6 and 7

## 5. Tracking

- 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)

## 6. Reporting

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

## 7. Education

- Clinical Providers
- Nursing staff
- Residents and Families

# Using Baseline Data to Form an Action Plan

| 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%)

- ❑ What are the top improvement opportunities?
- ❑ What Actions would you like to take?

# 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<br>• Use of decision-making algorithm |
| Broad spectrum agent being used unnecessarily | • Develop facility-specific guidance<br>• 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<br>• Implement antibiotic time-out |
| Unnecessary antibiotics being started by outside providers | • Implement mandatory review of necessity by medical directors for all outside antibiotic orders<br>• Implement antibiotic time-out |
| Unnecessary antibiotics being started by specific providers | • Consider providing specific feedback to the providers |

# Antibiotic Stewardship: A Cycle of Reassessments and Readjustments

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


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

- Analyze data
- Study outcomes
- Identify implementation barriers

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

# Thank You

Questions?