2026 Annual PADONA Conference

Empowering LTC Leaders to Be Antimicrobial Stewardship Champions

PADONA
PENNSYLVANIA ASSOCIATION OF DIRECTORS OF NURSING ADMINISTRATION

Disclosure

None of the planners for this educational activity have relevant financial relationship(s) to disclose with ineligible companies whose primary business is producing, marketing, selling, reselling, or distributing healthcare products used by or on patients.

Objectives

- Recognize inappropriate prescribing that can lead to resident harm and antimicrobial resistance.
- Discuss the importance of antimicrobial stewardship and the implementation of evidence-based processes to optimize resident safety.
- Review clinical outcomes to demonstrate the impact of antibiotic stewardship activities on resident outcomes.

CMS Regulations

F881

§483.80(a) Infection prevention and control program. The facility must establish an infection prevention and control program (IPCP) that must include, at a minimum, the following elements:

§483.80(a)(3) An antibiotic stewardship program that includes antibiotic use protocols and a system to monitor antibiotic use.

(State operations manual appendix PP - guidance to surveyors for long term care facilities)

Antimicrobial Stewardship

- Refers to a set of commitments and activities designed to “optimize the treatment of infections while reducing the adverse events associated with antibiotic use.”
- *Right* test, for the *right* resident to prompt the *right* action.

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(The core elements of antibiotic stewardship for nursing homes, Patterson Burdsall, D., Behan, L., & Trimberger, K.)

Antimicrobial Stewardship

- Improve and measure the appropriate use of antimicrobial agents
- Optimize antimicrobial selection:
  - Dose
  - Duration of therapy
  - Route of administration

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(Policy statement on antimicrobial stewardship)

Antimicrobial Stewardship Goals

Clinical outcomes related to antimicrobial use

Toxicity and other adverse events

May reduce excessive costs related to suboptimal antimicrobial use

(Policy statement on antimicrobial stewardship)

Influencing Factors

LTC Antimicrobial Stewardship

Residents, Families, Caregivers

Facility Environment

Provider

Resident, Family and Caregiver Factors

- Comorbidities
- Impaired communication
- Family concerns/pressures
- Diagnostic uncertainty

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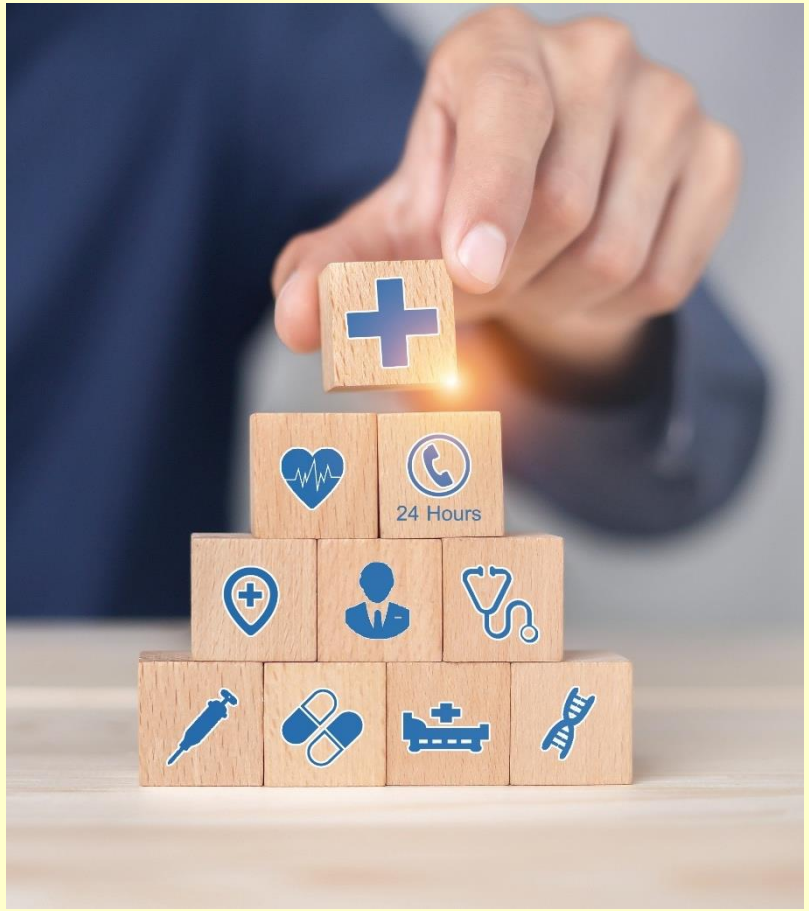
(Vyas, N., Good, T., Cila, J., Morrissey, M., & Gravel Tropper, D.; Reece, R., Chace, P., & Ranucci, S.)

Facility Environmental Factors



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- Limited and off-site diagnostics
- Lack of care continuity
- Limited access to infectious disease specialists
- Time constraints and limited staffing
- Staff turnover

(Vyas, N., Good, T., Cila, J., Morrissey, M., & Gravel Tropper, D.; Reece, R., Chace, P., & Ranucci, S.)

Provider Factors

- Telephone ordering
- Limited direct evaluation
- Past prescribing patterns
- Tendency towards risk aversion
- Knowledge and awareness of antimicrobial stewardship

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(Vyas, N., Good, T., Cila, J., Morrissey, M., & Gravel Tropper, D.; Reece, R., Chace, P., & Ranucci, S.)

(Vyas, N., Good, T., Cila, J., Morrissey, M., & Gravel Tropper, D.; Reece, R., Chace, P., & Ranucci, S.)

Report: Gut microbiome of nursing home residents a 'major reservoir' of antibiotic resistance genes

News brief | *August 13, 2024*

The Unsettling Truth About Ciprofloxacin: A Wonder Drug's Darker Side

This widely used antibiotic comes with serious risks—so why do doctors keep prescribing it?

A public health emergency is waiting at the bottom of the antibiotic resistance cliff

Antibiotics and Risk of Cutaneous Adverse Drug Reactions in Older Adults

Aug 12, 2024 | 3 Min Read | Suchandrima Bhowmik

Antibiotic resistance has claimed at least one million lives each year since 1990

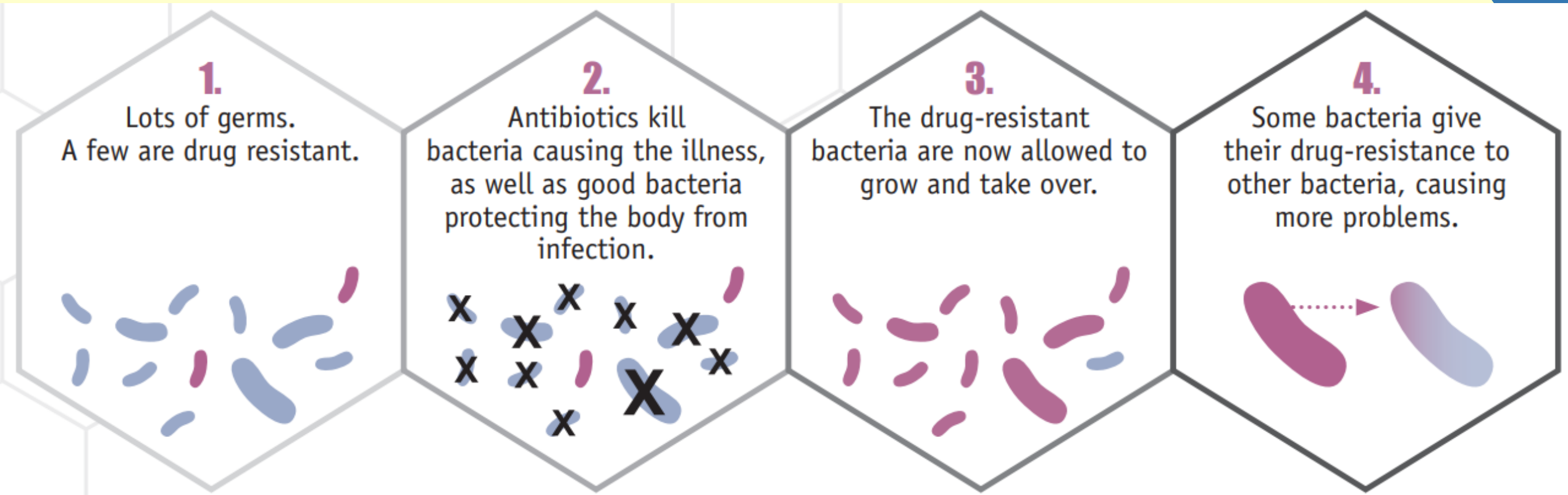
GLOBAL HEALTH | MEDICAL SCIENCES | RESEARCH

A landmark GRAM Project study of global antimicrobial resistance (AMR) burden over time forecasts a sharp rise in deaths, with 39 million lives lost between now and 2050.

HEALTH REPORTING IN THE STATES

Hospitals Look To Nursing Homes To Help Stop Drug-Resistant Infections

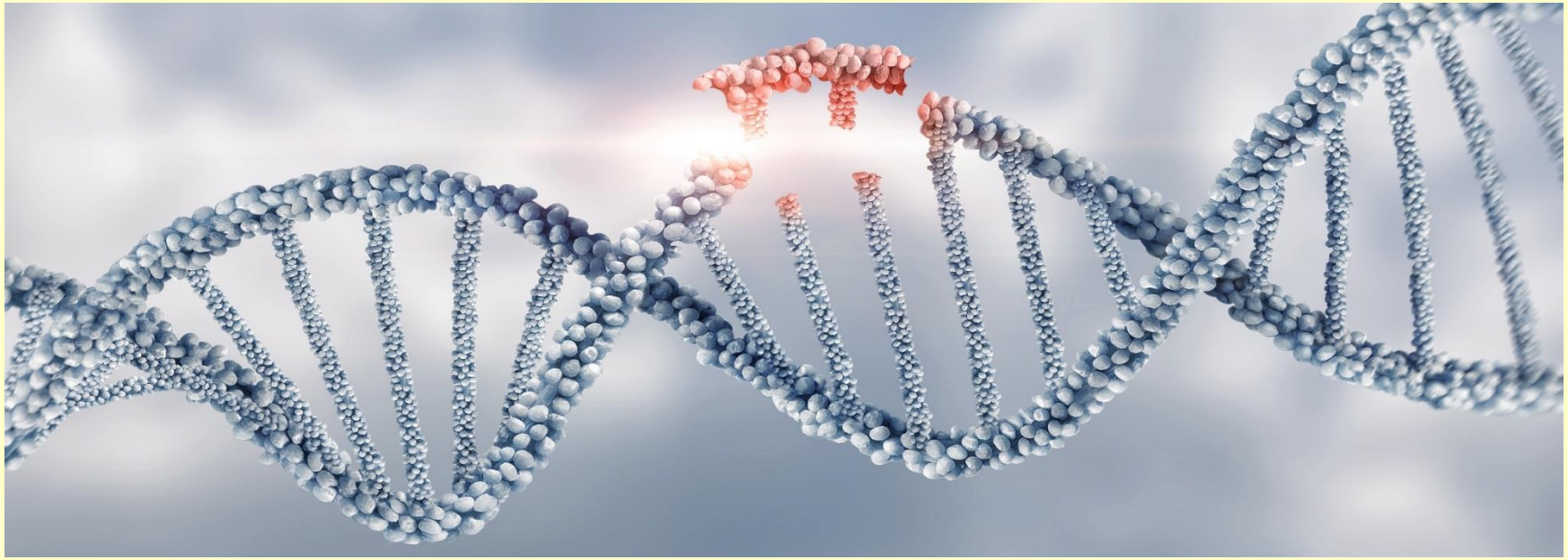
How Does Resistance Happen?



(Antibiotic resistance threats in the United States, 2013)

Development of Antimicrobial Resistance

- Point mutations in existing genes
- Acquisition of new genes



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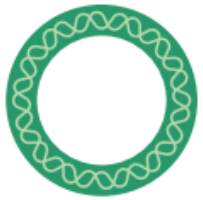
(Arnold, F. W.)

Mobile Genetic Elements

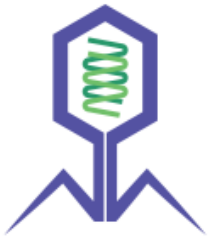


Plasmids

Circles of DNA that can move between cells.

Transposons

Small pieces of DNA that can go into and change the overall DNA of a cell. These can move from chromosomes (which carry all the genes essential for germ survival) to plasmids and back.

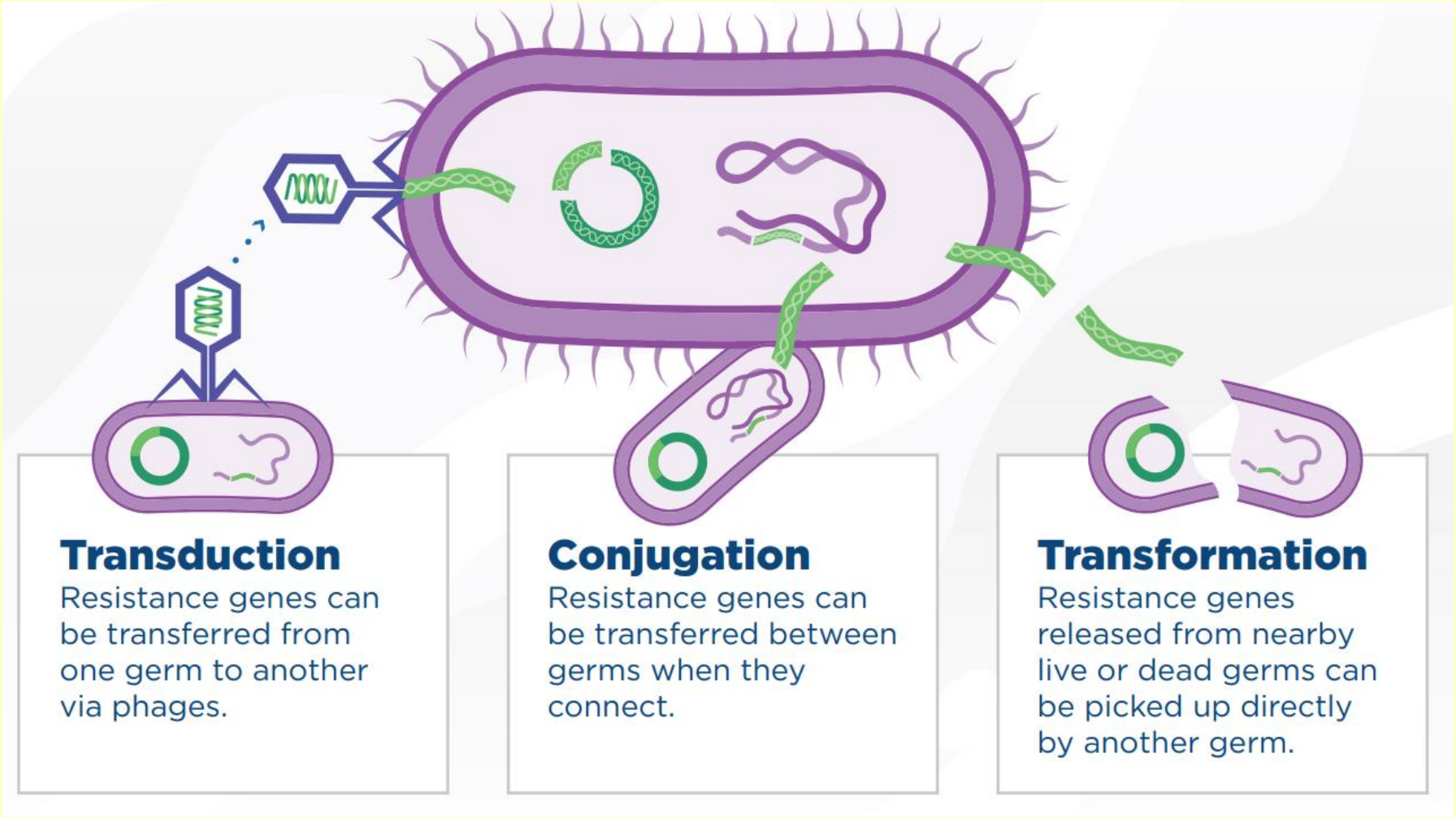


Phages

Viruses that attack germs and can carry DNA from germ to germ.

(How antibiotic resistance moves directly germ to germ)

How Mobile Genetic Elements



(How antibiotic resistance moves directly germ to germ)

Change the Target

- Organisms change the antibiotic's target so the drug can no longer fit and do its job

Change or Destroy the Antibiotic

- Organisms change or destroy the antibiotics with enzymes, proteins that break down the drug

Bypass the Effects

- Organisms develop new cell processes that avoid using the antibiotic's target

Get Rid of the Antibiotic

- Organisms get rid of antibiotics that enter the cell using pumps in cell walls

Restrict Access

- Organisms restrict access by changing the entryways or limiting the number of entryways

(Arnold F.W. , About antimicrobial resistance)

Development of Antibiotic Resistance Over Time

Antibiotic Approved or Released	Year Released	Resistant Germ Identified	Year Identified
Penicillin	1941	Penicillin-resistant *Staphylococcus aureus*[20, 21]	1942
		Penicillin-resistant *Streptococcus pneumoniae*[9,10]	1967
		Penicillinase-producing *Neisseria gonorrhoeae*[11]	1976
Vancomycin	1958	Plasmid-mediated vancomycin-resistant *Enterococcus faecium*[12,13]	1988
		Vancomycin-resistant *Staphylococcus aureus*[14]	2002
Amphotericin B	1959	Amphotericin B-resistant *Candida auris*[15]	2016
Methicillin	1960	Methicillin-resistant *Staphylococcus aureus*[16]	1960
Extended-spectrum cephalosporins	1980 (Cefotaxime)	Extended-spectrum beta-lactamase- producing *Escherichia coli*[17]	1983
Azithromycin	1980	Azithromycin-resistant *Neisseria gonorrhoeae*[18]	2011

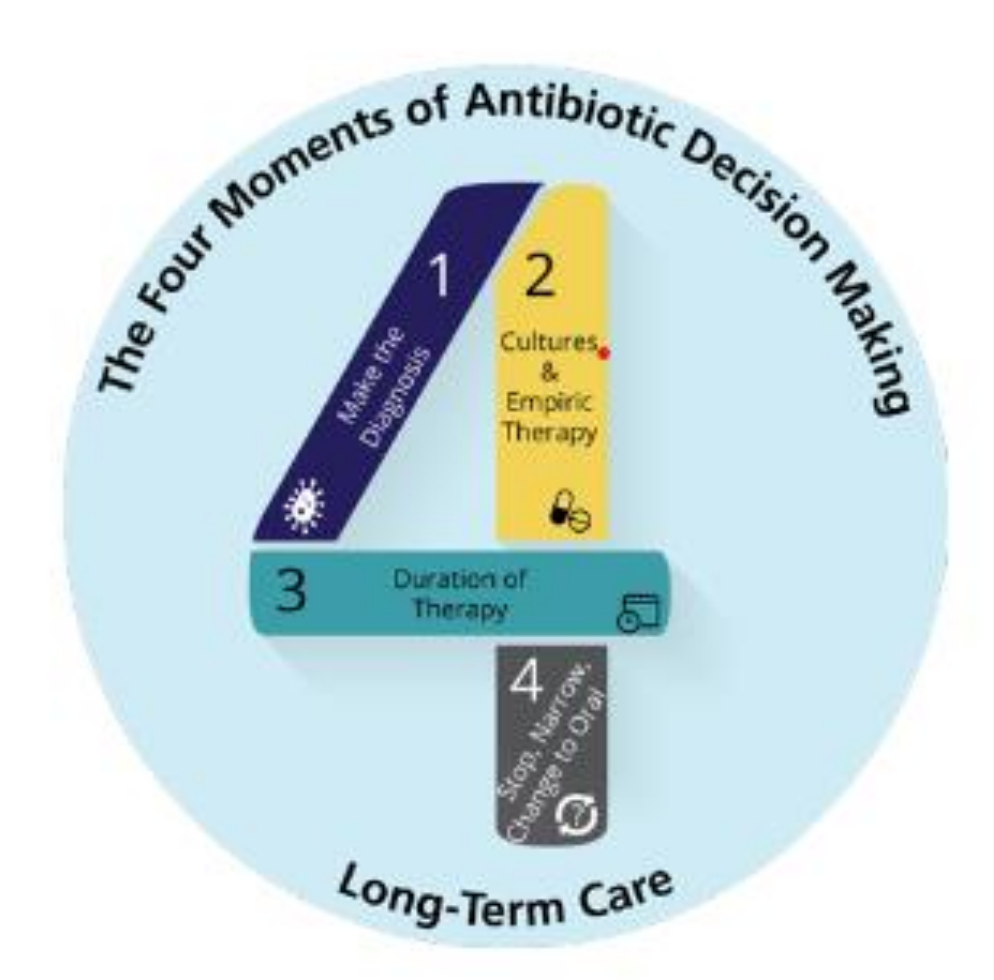
(Germs develop antibiotic resistance)

Development of Antibiotic Resistance Over Time

Antibiotic Approved or Released	Year Released	Resistant Germ Identified	Year Identified
Imipenem	1985	*Klebsiella pneumoniae* carbapenemase (KPC)-producing *Klebsiella pneumoniae*[19]	1996
Ciprofloxacin	1987	Ciprofloxacin-resistant *Neisseria gonorrhoeae*[20]	2007
Fluconazole	1990 (FDA approved)	Fluconazole-resistant *Candida*[21]	1988
Caspofungin	2001	Caspofungin-resistant *Candida*[22]	2004
Daptomycin	2003	Daptomycin-resistant methicillin-resistant *Staphylococcus aureus*[23]	2004
Ceftazidime-avibactam	2015	Ceftazidime-avibactam-resistant KPC-producing *Klebsiella pneumoniae*[24]	2015

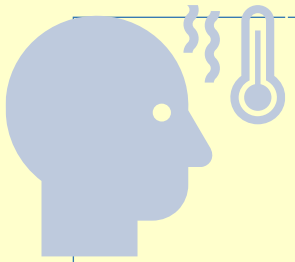
(Germs develop antibiotic resistance)

AHRQ Four Moments of Antibiotic Decision Making

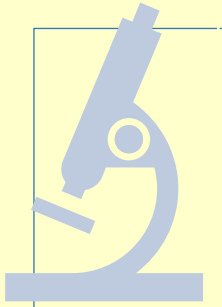


(Four moments of antibiotic decision making)

AHRQ Four Moments of Antibiotic Decision Making

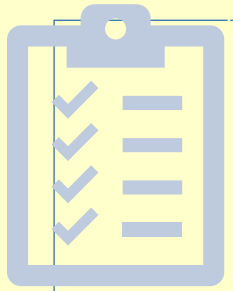


1. Make the diagnosis



2. Cultures and Empiric Therapy

3. Duration of Therapy



4. Stop, Narrow, Change to Oral

(Four moments of antibiotic decision making)

Moment 1: Make the Diagnosis

- When?
  - Resident assessed for change in status or concern for infection
- Does the resident have symptoms that suggest an infection?
- Were supportive measures attempted?

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Pause: Infection vs. another cause?

(Four moments of antibiotic decision making)

S **Situation:** Who you are calling about and why

B **Background:** Brief history and current status

A **Assessment:** Problem and how severe it is

R **Recommendation:** What needs to happen and time frame

(Communicating infectious concerns with antibiotic prescribers)

Moment 2: Cultures and Empiric Therapy

- When?
  - Immediately after the decision to prescribe antibiotics
- What type of infection is it?
- Have we collected appropriate cultures before starting antibiotics?
- What empiric therapy should be started?

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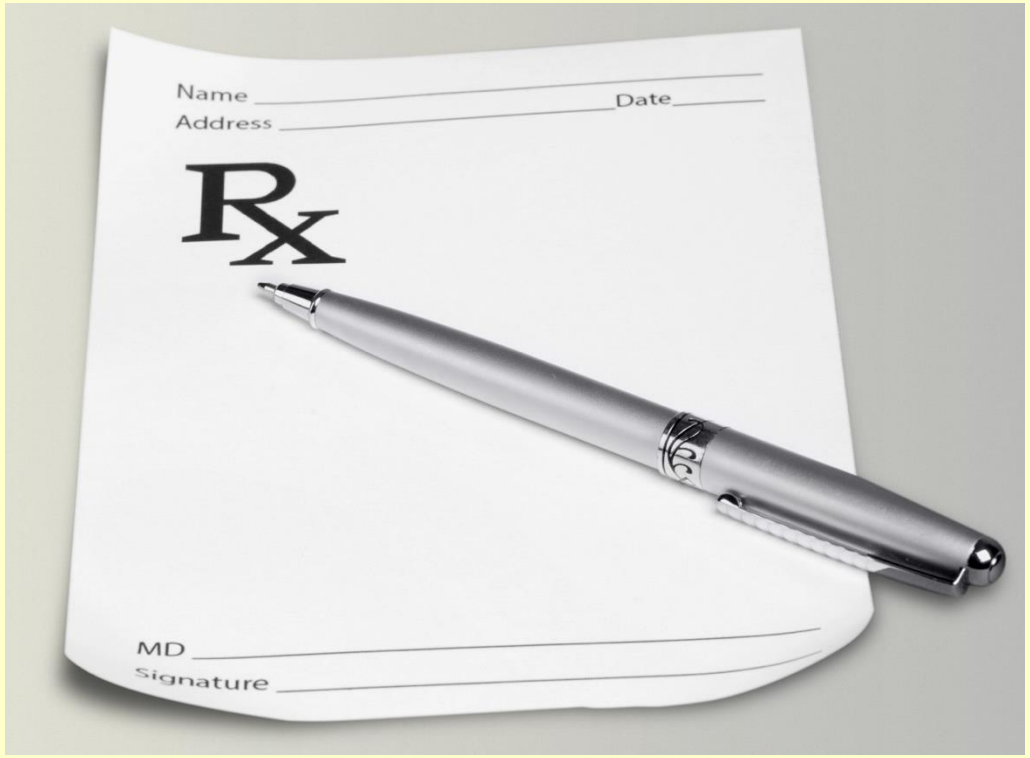
(Four moments of antibiotic decision making)

Moment 3: Duration of Therapy

- When?
  - Prescriber writes order for antibiotics
- What duration of therapy is needed for the resident's diagnosis?
- Has a planned duration been documented in the medical record?
- Is the planned duration consistent with local guidelines?



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Moment 4: Stop, Narrow, Change to Oral

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- When?
  - Everyday the resident receives antibiotics
- Are antibiotics still needed?
  - Can antibiotics be stopped?
  - Can therapy be narrowed?
  - Can you switch from IV to oral?

(Four moments of antibiotic decision making)

Antibiotic Time-Out

- 48 -72 hours after antibiotics are initiated
- Four key questions:
  - Does the resident have an infection that will respond to antibiotics?
  - Right antibiotic(s), dose and route of administration?
  - Can a more targeted antibiotic be used (de-escalate)?
  - How long should the resident receive the antibiotic(s)?

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(Antibiotic timeout protocol)

Watchful Waiting

- Assists in preventing inaccurate assessment and diagnosis
- Evaluates changes in condition without specific symptoms
- Promotes assessment and evaluation of the resident

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(Toolkit to educate and engage residents and family members)

Watchful Waiting

- Encourage hydration
- Record fluid intake
- Assess vital signs, including temp
- Notify provider if symptoms worsen or are unresolved

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(Toolkit to educate and engage residents and family members)

AHRQ Best Practices Materials

ASSESSMENT AND MANAGEMENT OF RESIDENT WITH SUSPECTED UTI, RTI OR SSTI

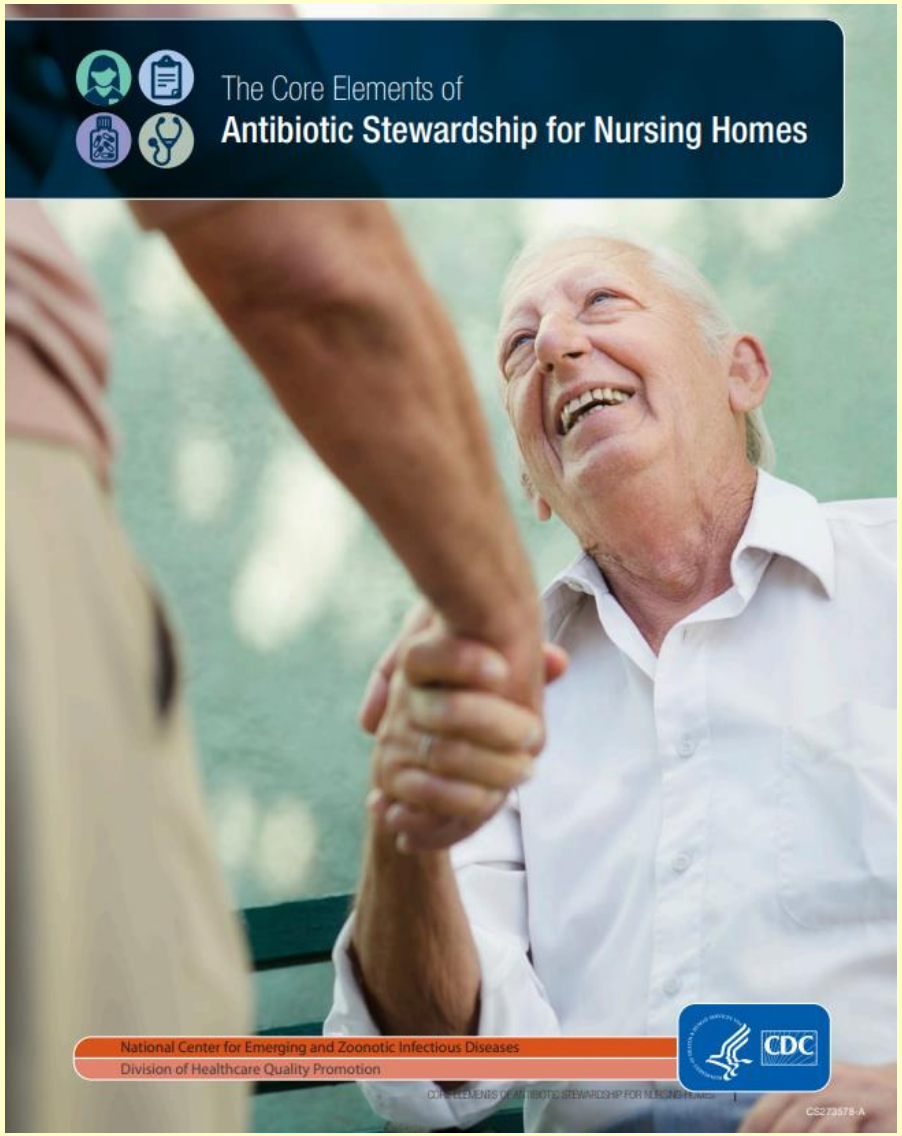
PENICILLIN ALLERGIES AND OTHER SIDE EFFECTS OF ANTIBIOTIC USE

MANAGEMENT OF CLOSTRIDIOIDES DIFFICILE INFECTION

APPROPRIATE COLLECTION OF MICROBIOLOGICAL SPECIMENS

BEST PRACTICES POCKET CARDS AND POSTERS

(Learn best practices for common infectious syndromes)



- Leadership commitment
- Accountability
- Drug expertise
- Action
- Tracking
- Reporting
- Education

(The core elements of antibiotic stewardship for nursing homes)

Process Measures

- Tracks how and why antibiotics are prescribed
- Asses if prescribing policies are being followed by staff and clinicians

Antibiotic Use Measures

- Tracks how often and how many antibiotics are prescribed
- Based on the type of intervention being implemented

Antibiotic Outcome Measures

- Tracks the adverse outcomes and costs of antibiotics
- Connects stewardship efforts with resident outcomes

(The core elements of antibiotic stewardship for nursing homes)

Getting Started Strategies

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- Identify champions and a team
- Use a checklist to identify targets for improvement
- Outline a plan
- Track prescribing practices
- Develop and implement an antibiogram
- Educate clinicians to infection criteria and treatment guidelines

(Toolkit to improve antibiotic use in long-term care)

Identify Champions and Team

- Medical Director
- Director of Nursing
- Infection Preventionist
- Pharmacist
- Laboratory
- Information Technology support
- Clinical and prescriber champions
- Family or resident representative

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Identify the Opportunities

Checklist for Core Elements of Antibiotic Stewardship in Nursing Homes

The following checklist is a companion to the Core Elements of Antibiotic Stewardship in Nursing Homes. The CDC recommends that all nursing homes take steps to implement antibiotic stewardship activities. Before getting started, use this checklist as a baseline assessment of policies and practices which are in place. Then use the checklist to review progress in expanding stewardship activities on a regular basis (e.g., annually). Over time, implement activities for each element in a step-wise fashion.

LEADERSHIP SUPPORT	ESTABLISHED AT FACILITY
1. Can your facility demonstrate leadership support for antibiotic stewardship through one or more of the following actions?	❑ Yes ❑ No

If yes, indicate which of the following are in place (select all that apply)

- ❑ Written statement of leadership support to improve antibiotic use
- ❑ Antibiotic stewardship duties included in medical director position description
- ❑ Antibiotic stewardship duties included in director of nursing position description
- ❑ Leadership monitors whether antibiotic stewardship policies are followed
- ❑ Antibiotic use and resistance data is reviewed in quality assurance meetings

(The core elements of antibiotic stewardship for nursing homes)

Our Commitment to Antibiotic Stewardship

Antibiotics save lives, but are frequently prescribed unnecessarily. Harms from antibiotic overuse can be significant, especially for frail older adults. Potential harms include adverse drug events, drug interactions, and antibiotic-resistant and *Clostridioides difficile* infections.

As part of our continuing commitment to provide the best quality care to our residents, we are dedicated to improving antibiotic use through antibiotic stewardship implementation. **Antibiotic stewardship** refers to a set of commitments and activities designed to "optimize the treatment of infections while reducing the adverse events associated with antibiotic use."

We are committed to improving antibiotic prescribing practices. We will provide staff and resources to support antibiotic stewardship implementation. We are confident that with the support of front-line staff, prescribing clinicians, and residents and families, we will continue to provide residents with the best quality care by improving antibiotic use, and protecting them from the unintended harms of inappropriate antibiotic use.

Sincerely,

To learn more about appropriate antibiotic prescribing and use, visit www.cdc.gov/antibiotic-use.

BE ANTIBIOTICS AWARE
SMART USE, BEST CARE

CS 294480

CS269-3097-A

CDC
Centers for Disease Control and Prevention
National Center for Emerging and Zoonotic Infectious Diseases

(Our commitment to antibiotic stewardship)

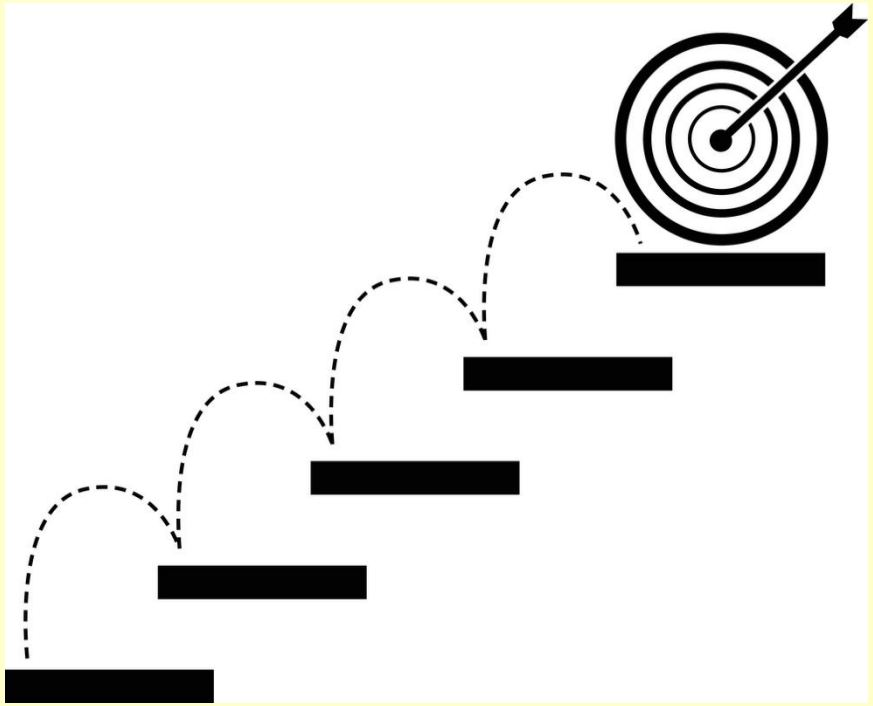
Outline Goals and a Plan

Short and long-term goals:

- Strategies based on assessment

Plan:

- Statement of leadership support
- Resources to gather data and provide education
- Timeline, responsibilities, budget, meeting schedules and agendas
- Sustainability strategies



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(Toolkit to improve antibiotic use in long-term care)

Document, Document, Document

Clinical Assessment:

- Symptoms
- Vital Signs
- Physical Exam
- Lab Findings

Antibiotic Prescribing:

- Dose
- Duration
- Indication
- Clinical Response

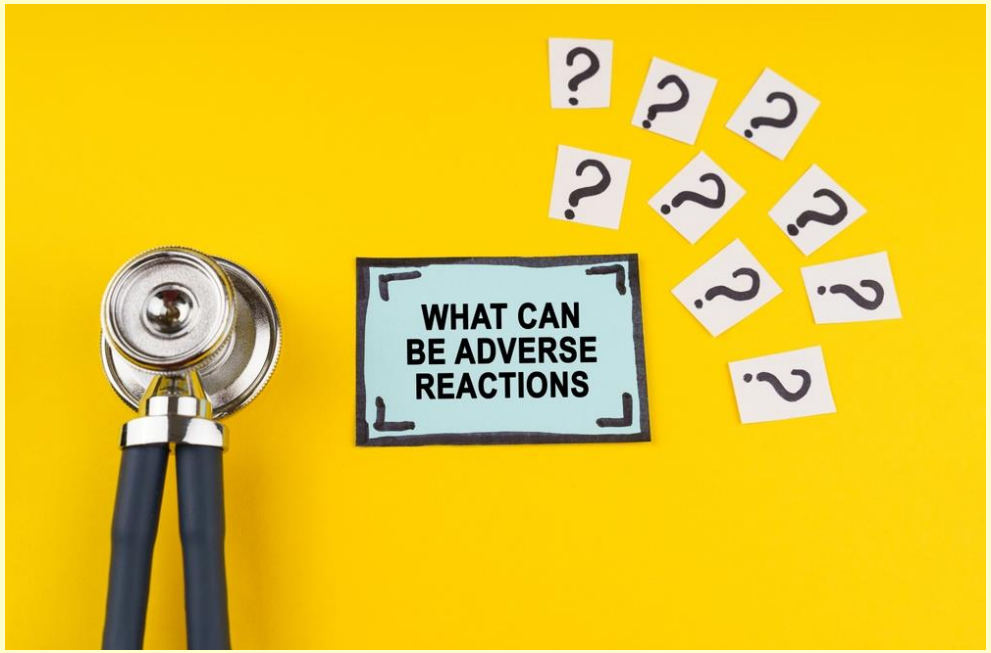
(The core elements of antibiotic stewardship for nursing homes Appendix B)

Antibiogram

- Monitor trends in drug resistance
- Used to determine the best antimicrobials for empiric antibiotic therapy
- Nursing home specific, inexpensive and effective

(Toolkit 3. the nursing home antibiogram program toolkit: how to develop and implement an antibiogram program)

Antibiotic Outcome Measures



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Indicates the results an intervention

Desirable or undesirable events

Examples include:

- *C. difficile*
- Antibiotic resistance
- Adverse drug events
- Costs related to antibiotic use

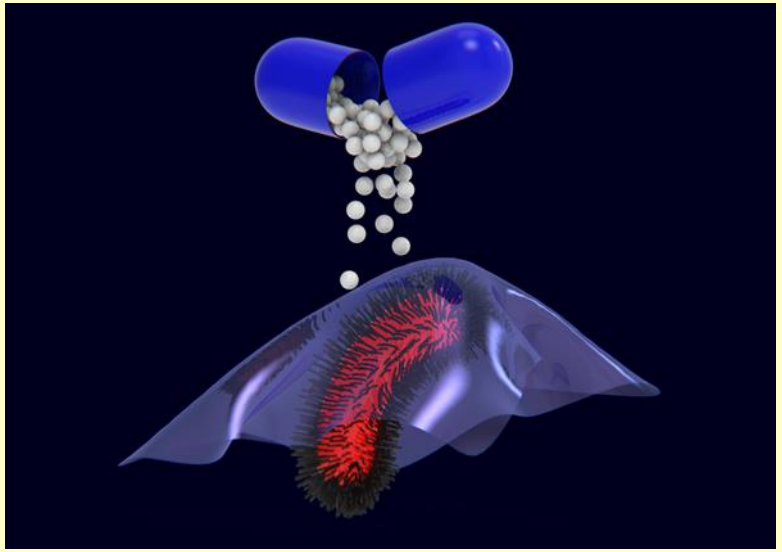
(Arnold, F. W.)

The most important risk factor for *C. difficile* infection is antibiotic exposure

(Deshpande, A., Pasupuleti, V., Thota, P., Pant, C., Rolston, D. D., Sferra, T. J., Hernandez, A. V., & Donskey, C. J.)

C. difficile and Antibiotic Resistance

- CDI infection rates parallel rates of other illness caused by antimicrobial resistance
- Tracking *C. difficile* and other MDROs rates can be used as a direct reflection of prescribing patterns in the facility
- High-risk Antimicrobials:
  - Clindamycin
  - Cephalosporins
  - Monobactams
  - Carbapenems
  - Fluoroquinolones



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(Deshpande, A., Pasupuleti, V., Thota, P., Pant, C., Rolston, D. D., Sferra, T. J., Hernandez, A. V., & Donskey, C. J.)

Adverse Drug Events

Up to 20% of hospitalized patients:

- Allergic reactions
- Gastrointestinal symptoms
- End-organ toxic effects such as acute kidney injury
- CDI

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(Monsees E, Goldman J)

Costs Related to Antibiotic Use

- Reflects efficiency and can help understand the balance between cost and benefit
- Supports use of staff time and external consultant support

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(Soule BM, Nadzam, DM)

Antimicrobial Stewardship Outcome Measure Goals

Decrease in % of CDI infection by end of 2026

Decrease in % of adverse drug events by end of 2026

Data Feedback

- Report back to staff members
- Reinforces that the facility values antimicrobial stewardship
- Facility level and individual level
- Pair feedback with education

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(Developing an antibiotic stewardship program)

Communication

FEEDBACK FORM FOR PROVIDERS

COMMUNICATE ANTIBIOTIC STEWARDSHIP PRIORITIES

LETTER TO OBTAIN ALGORITHM FROM LAB

SAMPLE NEWSLETTER ARTICLE

(Minnesota antimicrobial stewardship program resources for long-term care facilities)

Sustainability

- Leadership
- Culutre of Improvement
- Hardwiring Change
- Data Collection and Feedback
- Assessment and Resources
- Celebrate wins

(Sustaining your antibiotic stewardship program)

Key Points of Stewardship

- Avoid unnecessary antibiotics
- Obtain necessary cultures
- Appropriate dose and duration
- Re-evaluate within 48-72 hours

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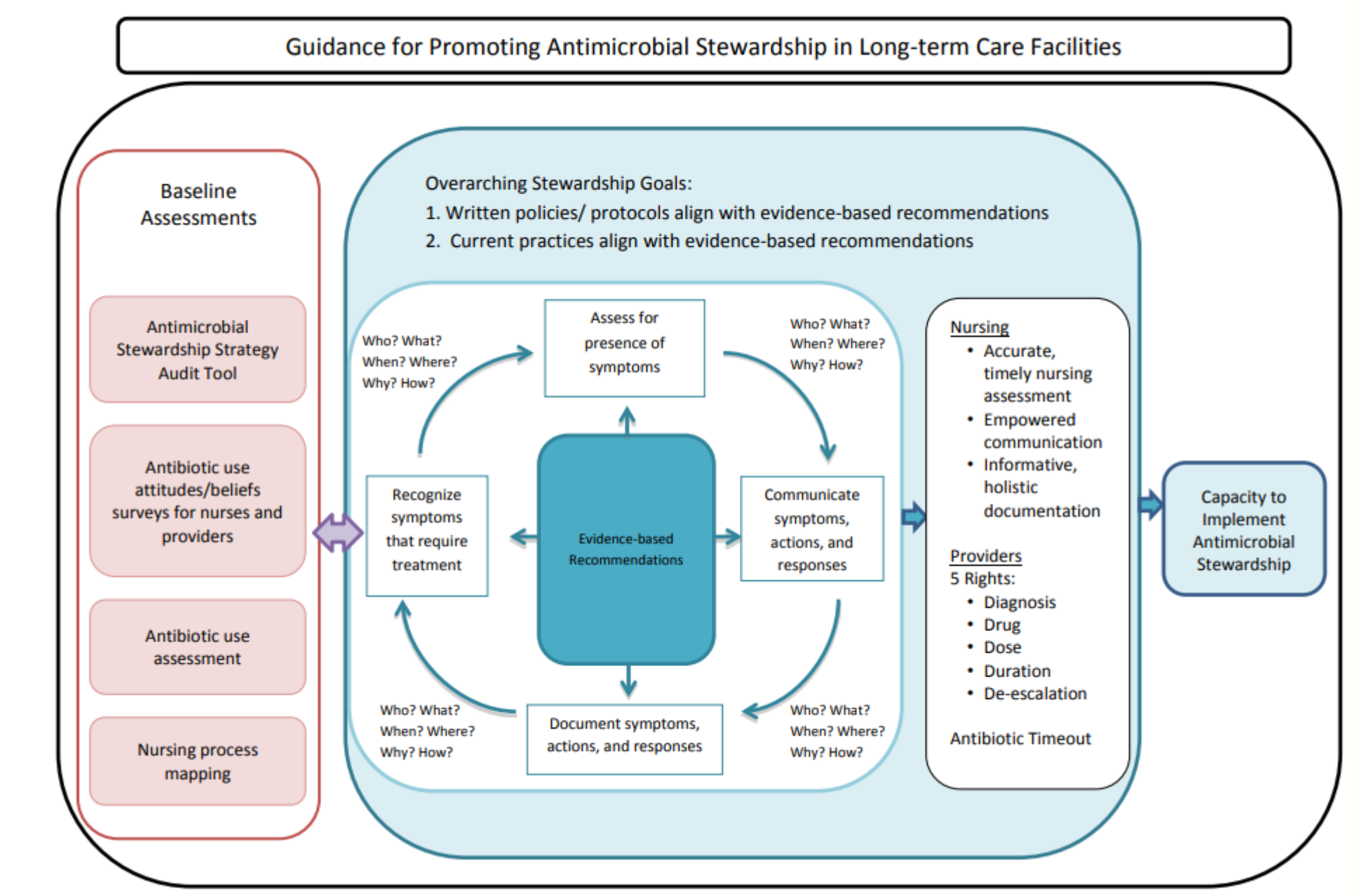

(Minnesota antimicrobial stewardship program resources for long-term care facilities)

Effectiveness of Antibiotic Stewardship Programs

- Implementation of Antibiotic Stewardship Program in Long-term Care Facilities Across the US (Katz et al., 2022)
  - Decrease in antibiotic starts, fluoroquinolones showing the greatest decrease
  - Urine cultures decreased
  - The greater the engagement the greater the reduction
- Antibiotic Use and Stewardship in the United States, 2024 Update: Progress and Opportunities (CDC)
  - The percent of residents receiving at least one antibiotic each year decreased from 51% in 2013 to 44% in 2021
  - The percentage of long-term care facilities meeting all 7 Core Elements increased from 43% in 2016 to 82% in 2023.

PSA PATIENT SAFETY AUTHORITY

Meet the Infection Prevention Advisors

Lana Mason
MPH, RN, CIC

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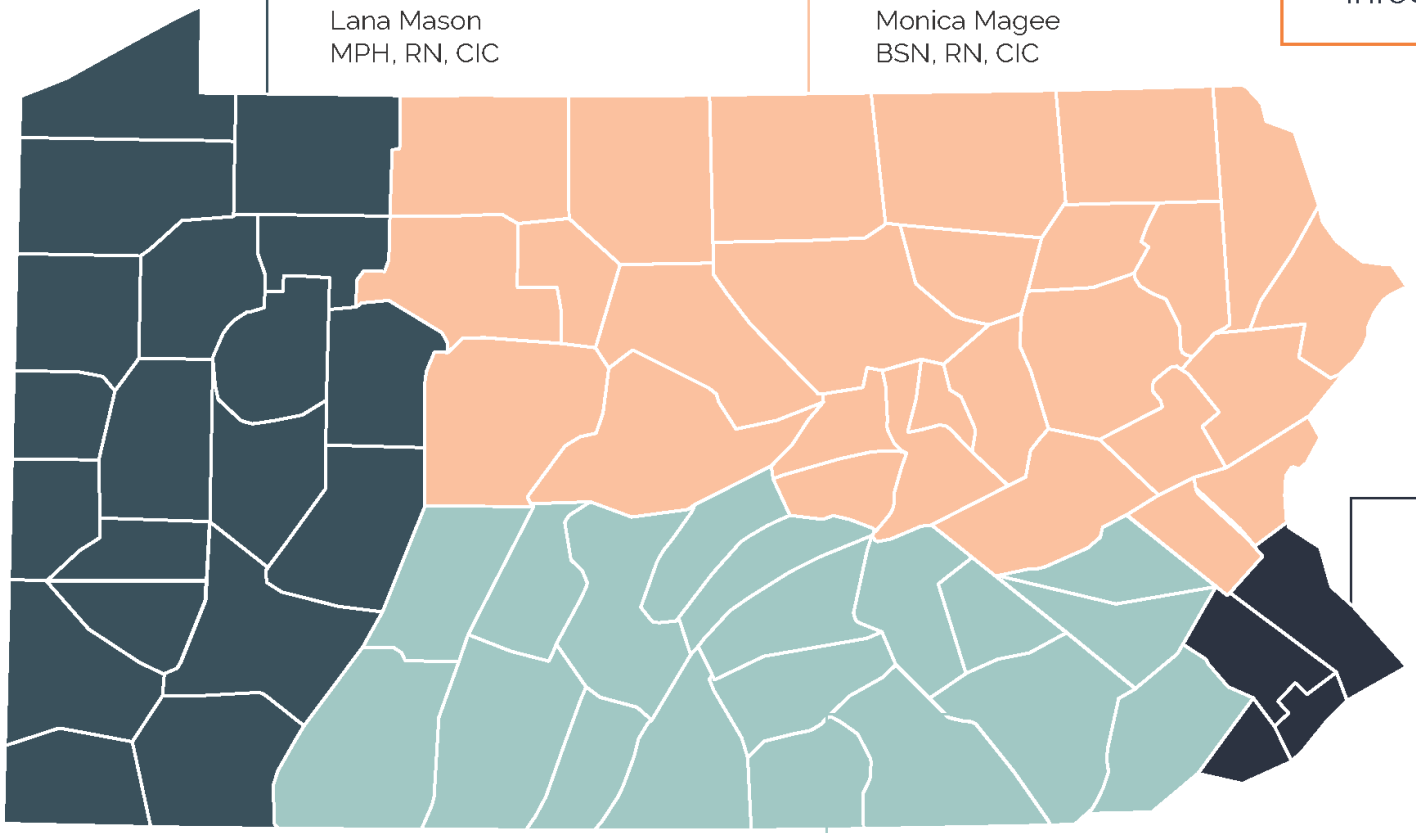

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