



SUPERIOR HEALTH
Quality Alliance

Infection Preventionist Workgroup: Week 4

F881 Antibiotic Stewardship

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Objectives

- To identify the Centers for Medicare & Medicare Services (CMS) requirements for antibiotic stewardship for skilled nursing facilities (SNF).
- To understand and implement an antibiotic stewardship program in your facility.
- To employ evidence-based criteria for antibiotic use and surveillance.
- To implement tools to evaluate the effectiveness of your antibiotic stewardship program.

Introduction to Antibiotic Stewardship

Discovery of Antibiotics: Alexander Fleming 1928

- Changed the course of medicine.
- Destroy bacteria or alter it so it cannot grow.
- Saved countless lives.
- Use to prevent infections (pre-surgical, transplants, cancer, premature infants, etc.).
- But it has come with unintended consequences...

Source: The Centers for Disease Control and Prevention (CDC), [Core Elements of Antibiotic Stewardship for Nursing Homes](#) and [The Discovery of Penicillin-New Insights After More Than 75 Years of Clinical Use](#)

Antibiotic Overuse

- 4.1 million people enter a nursing home each year.
- One in 10 nursing home residents is on an antibiotic at any time.
- 70% of nursing home residents will receive a course of antibiotics every year.
- Up to 75% of these antibiotic courses have been deemed inappropriate and unnecessary.

Led to...

- Increased adverse drug events/anaphylactic reactions.
- Increased risk of getting *Clostridioides difficile* infection (CDI) while taking antibiotics for up to 12 weeks after end of course.
 - 90% of the deaths associated with CDI occur in individuals > 65.
 - One in nine older adults with CDI die within 30 days of diagnosis.
- Colonization and/or development of infection of antibiotic-resistant organisms (MDRO).

Along Came Antimicrobial Stewardship!

- Association for Professionals in Infection Control and Epidemiology (APIC) definition: a coordinated program that promotes the appropriate use of antimicrobials (including antibiotics), improves patient outcomes, reduces microbial resistance and decreases the spread of infections caused by multidrug resistant organisms.
- CDC: the effort to measure and improve how antibiotics are prescribed by clinicians and used by patients. Refers to a set of commitments and actions designed to “optimize the treatment of infections while reducing the adverse events associated with antibiotic use.”
- Clinical Microbiology and Infection (CMI) states we should consider antimicrobials a “precious non-renewable resource” to use when they are indicated and avoid unnecessary use.

F Tag Basics: What Does Antimicrobial Stewardship Mean for Long-Term Care

State Operations Manual (SOM): 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 use.

Intent

To ensure facility:

- Develops and implements protocols to optimize the treatment of infections by ensuring that residents who require an antibiotic, are prescribed the appropriate antibiotic;
- Reduces the risk of adverse events, including the development of antibiotic-resistant organisms, from unnecessary or inappropriate antibiotic use; and
- Develops, promotes and implements a facility-wide system to monitor the use of antibiotics.

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.

Leadership, Accountability and Expertise

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:

- Medical director
- Consulting pharmacist
- Nursing/administrative leadership
- Individual with designated responsibility for IPCP i.e.: infection preventionist (IP).

Action and Reporting

The antibiotic stewardship program protocols shall describe how the program will be implemented and antibiotic use will be monitored.

- Incorporate into the overall IPCP.
- Reviewed annually.
- System of reporting.
 - Antibiotic use (pharm/electronic medical record [EMR])
 - Antibiotic resistance (antibiogram)
 - Outcome measures related to antibiotic use (multi-drug resistant organism [MDRO])

Action and Reporting (continued)

Monitoring antibiotic use/provide feedback to prescribers.

- Response.
- Labs/Cultures.
- Antibiotic time-out.
- Drug regimen review (DRR) by pharmacy.
- Antibiotic resistance.
- Compliance with facility protocols.

Action and Tracking

- Assessing residents for infection using standardized tools and criteria.
 - Loeb's
 - Situation, Background, Assessment, Recommendation (SBAR)
- Require antibiotic orders to include the indication, dose, duration.

Education Requirements

- At least annually, educate prescribers and nursing staff (include certified nursing assistants [CNAs]) on antibiotic stewardship, antibiotic use protocols and your facility's antibiotic use/MDRO data.
- Include residents and families by providing information in the admission packet, displaying a commitment letter and sharing pamphlets.
- CDC TRAIN Learning Network, [Antibiotic Stewardship: Education for Staff and Providers](#)

Related FTags

F756 Drug Regimen Review

F757 Unnecessary Medications

F880 IPCP

F881 Infection Preventionist

F552 Resident Right to be Informed in Advance about Care and Treatment

F684 Quality of Care

F675 Quality of Life

F657 Care Planning

F945 Infection Control Training

Resources for Developing Your Antimicrobial Stewardship Program

- [Toolkit To Improve Antibiotic Use in Long-term Care](#), Agency for Healthcare Research and Quality (AHRQ)
- [Antimicrobial Stewardship Program Resources for Long-Term Care Facilities](#), Minnesota Department of Health (MDH)
- [Core Elements of Antibiotic Stewardship for Nursing Homes](#), CDC
- [Antibiotic Prescribing and Use: Continuing Education and Informational Resources](#), CDC
- [The Core Elements of Antibiotic Stewardship for Nursing Homes Checklist](#), CDC
- [IPC Resources: Antibiotic Stewardship](#), Superior Health Quality Alliance (Superior Health)
- Contact Superior Health for individualized support from a quality improvement advisor.

Antibiotic Stewardship Policy and Procedures

Antibiotic Stewardship Policy

Purpose of an Antibiotic Stewardship Policy

- Policies should be updated to reflect the facility's current standards of practice.
- Limit antibiotic resistance.
- Improve treatment efficacy.
- Promote resident safety.
- Reduce treatment-related costs.

Procedures

- Five “D”s of antimicrobial therapy.
- Implementing an antibiotic stewardship program.
- Adhere to clinical and surveillance criteria.

Procedures of an Antibiotic Stewardship Program

- Initiate a 72-hour time out.
- Follow [The Four Moments of Antibiotic Decision Making](#).
- Implement an antibiotic algorithm.
- Identify antibiotic stewardship champions.
- Regular auditing.
- Prescribers self-evaluate prescribing practices.
- Initiate infection modules.
 - e.g., urinary tract infection module
- Integrate quality improvement initiatives.

Antibiotic Stewardship Procedures: Who Is Involved?

Include:

- Medical Director
- Director of Nursing (DON)/IP
- Consulting Pharmacist
- Education
- Staff
 - Orientation
 - Annually
- Residents
- Family

Antibiotic Stewardship Policy and Procedures

- Requires prescribers to document an indication for all antibiotics in the resident's medical record or during order entry.
 - Documentation of indication, dose and duration for every antibiotic course.
 - Facility-specific treatment guidance for common infections based on practice guidelines.
- Antibiotic Review
 - Reassessing treatment after antibiotic start.
- Tracking and Reporting process and measure of antibiotic use.

Antibiotic Stewardship Compliance

Compliance

- Monitoring antibiotic outcome measures.
- Tracking usage:
 - Primary laboratory
 - Long-term care (LTC) pharmacies
 - Electronic health record (EHR)
 - Manual chart review
- Antimicrobial stewardship program team
- Antimicrobial stewardship champions
- Monthly/quarterly Quality Assurance and Performance Improvement (QAPI) reporting

Key Elements of Compliance

- Implement antibiotic use protocols.
- Monitor the use of antibiotics within the facility.
- Ensure the appropriate antibiotics are prescribed.

Using Antibigram to Improve Antibiotic Prescribing and Delivery

Antibiogram

- Used to provide prescribing clinicians with facility-specific historical information on sensitivity data to assist in initial prescribing of an antibiotics.
- Aggregates antibiotic usage over a period of time.
- Displays the organisms present in clinical specimens as well as the susceptibility of each organisms to an array of antibiotics.

The Importance of Using an Antibigram

- Encourages responsible use of antibiotics.
- Detects changes in a microorganisms' resistance patterns.
- Easily accessible from:
 - Primary laboratory.
 - Contracted pharmacy.
 - Or create your own.
- Organizes data.
- Provides guidance for empiric antibiotic use.

Example: Antibigram

		Aminoglycosides			B-Lactams			Cephalosporins				Quinolones	Others			
Gram (-)	# of Patients	Amikacin	Gentamicin	Tobramycin	Ampicillin	Imipenem	Piperacillin-Tazobactam	Cefazolin	Cefoxitin	Ceftriaxone	Ceftazidime	Ciprofloxacin	Nitrofurantoin	TMP/SMX		
Highlighted rows include less than 30 isolates; interpret these results with caution																
Escherichia coli	37	100	100	100		100	100				100	75				
Klebsiella sp*	33*	100	84.6	92.3	38.5	100	92.3	84.6	100	100	100	38.5	92.3	38.5		
Proteus sp	31	71.4	57.1	71.4		85.7	85.7			57.1	57.1		28.6	71.4		
Pseudomonas aeruginosa	23	100	83.3	92.3	91.7		100		81.8	100	100	30.8		69.2		
		Penicillins				Cephalosporins		Quinolones		Others						
Gram (+)	# of Patients	Penicillins	Ampicillin	Oxacillin	Nafcillin	Cephalothin	Ceftriaxone	Ciprofloxacin	Moxifloxacin	Gentamicin	Linezolid	Rifampin	Tetracycline	TMP/SMX	Vancomycin	Nitrofurantoin
Highlighted rows include less than 30 isolates; interpret these results with caution																
Staph aureus (all)	17†	0	0	0	0			0	0	87.5	100	100	100	100	100	100
Methicillin Resistant (MRSA)	34	0	0	0	0			0	0	87.5	100	100	100	100	100	100
Methicillin Susceptible (MSSA)	0															
Enterococcus sp*	30*	100	100					50		75			25		100	100

*This antibiogram uses two years of culture data for these organisms †Results based on fewer than 20 isolates are less reliable and should be interpreted with caution

Distributing the Data

[Nursing Home Name] Antibiogram January 2013-January 2014				
GRAM POSITIVE		MRSA	<i>Enterococcus</i> sp	<i>Streptococcus agalactiae</i>
# of Residents		34	30*	0
Penicillins	Penicillin	0	100	
	Ampicillin	0	100	
	Oxacillin	0		
	Nafcillin	0		
Quinolones	Ciprofloxacin	0	50	
	Moxifloxacin	0		
Others	Gentamicin	87	75	
	Linezolid	100		
	Rifampin	100		
	Tetracycline	100	25	
	TMP/SMX	100		
	Vancomycin	100	100	
	Nitrofurantoin	100	100	
* Indicates when 2 years of resident data used. Results in small numbers on a grey background indicate fewer than 30 isolates used; interpret these results with caution.				

The antibiogram provides an estimate of % susceptibilities for bacteria isolated in residents. Use this as a guideline in selecting empiric therapy. Refer to lab results for specific susceptibility of individual resident isolates.

GRAM NEGATIVE		<i>Escherichia coli</i>	<i>Klebsiella</i> sp	<i>Proteus</i> sp	<i>Pseudomonas aeruginosa</i>
# of Residents		37	33	31	23*
Aminoglycosides	Amikacin	100	100	71.4	100
	Gentamicin	100	84.6	57.1	83.3
	Tobramycin	100	92.3	71.4	92.3
B-Lactams	Ampicillin		38.5		91.7
	Imipenem	100	100	85.7	
	Piperacillin-tazobactam	100	92.3	85.7	100
Cephalosporins	Cefazolin		84.6		
	Cefoxitin		100		81.8
	Ceftriaxone		100	57.1	100
	Ceftazidime	100	100	57.1	100
Others	Ciprofloxacin	75	38.5		30.8
	Nitrofurantoin		92.3	28.6	
	TMP/SMX		38.5	71.4	69.2

Source: AHRQ, [Toolkit 2. Using Nursing Home Antibiograms To Choose the Right Antibiotic \(Concise Antibiogram Toolkit\)](#) and [Concise Antibiogram Toolkit: Getting Started—Sources of Data](#)

Creating Your Own Antibigram

Concise Antibigram Toolkit
Comprehensive Antibigram Template

	Aminoglycosides		Penicillins				Cephalosporins				Macrolides		Quinolones			Others													
Gram (+)	Number of Residents	Gentamicin	Tobramycin	Ampicillin	Oxacillin	Nafcillin	Penicillin	Ticarcillin	Cephalothin	Cefoxitin	Cefepime	Ceftazidime	Ceftriaxone	Erythromycin	Clindamycin	Linezolid	Ciprofloxacin	Gatifloxacin	Levofloxacin	Moxifloxacin	Amoxicillin-Clavulanate	Aztreonam	Daptomycin	Ertapenem	Nitrofurantoin	Rifampin	Streptomycin	Tetracycline	TMP/SMX
Staph aureus (all)																													
Methicillin Resistant (MRSA)																													
Methicillin Susceptible (MSSA)																													
Staphylococcus coag neg																													
Enterococcus faecalis																													
Enterococcus faecium																													
Enterococcus sp																													
Streptococcus pneumoniae																													
Streptococcus agalactiae																													
Streptococcus sp																													

Resources for Antimicrobial Stewardship

AHRQ

- [Four Moments of Antibiotic Decision Making](#)
- [Antibiotic Stewardship Program Resources for Nursing Home](#)
- [Nursing Home Antimicrobial Stewardship Guide](#)
- [Antimicrobial Stewardship](#)
- [Antibiotic Stewardship Toolkits](#)

CDC

- [Core Elements of Antibiotic Stewardship for Nursing Homes](#)

McGeer, Loeb Criteria

Loeb Criteria for Antibiotic Therapy

- Clinical criteria used for clinical decisions regarding initiation of antibiotics.
- Concurrent use when assessing a resident for a suspected infection.
 - Consider the resident – signs, symptoms, any available diagnostic testing (not always available yet).
 - Consider resident's history, any devices in use.
- A minimum set of signs and symptoms which, when met, indicate that the resident likely has an infection and that an antibiotic might be indicated.
 - Err on the side of caution.

Source: Tufts Medical Center, [Loeb and Revised McGeer Criteria](#) and MDH, [Loeb and McGeer Criteria](#)

McGeer (revised) Criteria for Antibiotic Therapy

- Retrospective surveillance (look back) to count cases consistently.
- Criteria is used to count true cases of an infection and to estimate the numbers/incidence of a type of infection.
- Use all data available (diagnostic testing, signs, symptoms)
- Not intended to assist with treatment decisions.
- Failure to meet this criteria does not always mean that an infection was not present.

Communicating With Providers

Situation, Background, Assessment, Recommendation (SBAR) Template for Physician/NP Communication, Minnesota Department of Health



SBAR Template for Physician/NP Communication

SITUATION, BACKGROUND, ASSESSMENT, RECOMMENDATION/REQUEST

When calling the primary or on-call provider, consider the following changes in condition. Communicate those that are present and not present to facilitate accurate and effective clinical decision making.

Resident name: _____ DOB: _____ Unit/room: _____

S | Situation

Reason for the call (e.g., change in condition); include date of onset, frequency, and duration:

Vital signs (note baseline value, if different):

Temp: _____ BP: _____ P: _____ RR: _____

B | Background

Primary diagnosis or reason resident is in facility: _____ Recent lab or diagnostic test results: _____

Pertinent history (e.g., precipitating, aggravating, alleviating factors): _____ Medication allergies and reactions: _____

Has reason for call occurred before? Describe: _____ Advance directives / POLST: _____

A | Assessment

What do you think is going on (e.g., dehydration, medication problem)?

I'm not sure what is going on. Describe: _____

R | Recommendation/Request:

☐ Visit? Specify: _____ ☐ Medication change? Specify: _____ ☐ New order? Specify: _____ ☐ Just providing information.

Instructions or questions from physician/NP: _____

health_stewardship@state.mn.us
4/18/23

1 To obtain this information in a different format, call: 651-201-5414.

Resources: Loeb and McGeer

- [Loeb and McGeer Criteria: A Practical Guide for Use in Long-term Care](#), MDH
- [Loeb and Revised McGeer Criteria](#), Tufts Medical Center
- [Minimum Criteria for Initiation of Antibiotics in Long-Term Care Residents](#), MDH
 - [Poster version](#)
- [Determining Appropriateness of Initiating Antibiotic therapy in Nursing Home Residents](#), Jacobs School of Medicine and Biomedical Sciences University at Buffalo

Auditing, Reviewing Your Results

Auditing

- Nurse's notes for signs, symptoms (s/s).
- Physician orders.
- Physician progress notes.
- Nurse's notes for ongoing monitoring of antibiotic therapy, side and adverse effects; effectiveness of therapy; s/s sepsis; ongoing communication with provider
- 72 hr. Time out/re-evaluation of therapy for appropriateness.
- Month end review of antibiotic therapy with McGeer criteria.

Role of Facility Leadership: Director of Nursing (DON) and Administrator

Starting the Conversation

- Education on admission for responsible parties and residents.
- Education at hire with nurses and with providers.
- Communication with providers on their usage of antibiotic therapy using pharmacy reports.

Education of Residents and Responsible Parties: Ideas

- Share the CDC Antibiotic resources for family members
- Attend a Resident Council and talk about the use of antibiotics and outcomes.
- Add an infection prevention tip section in your newsletter.
- Educate your residents about superbugs involving a fun activity.

All Staff Education: Things to Consider

- Do your staff understand the overuse of antibiotics and the links to “super bugs”?
- Do you provide education on McGeer or Loebis to your nurses?
- Do your providers understand the criteria?

High Level Audit Thoughts: Look at the Details

- Patterns of orders: weekend, off shift, specific nurses/providers?
- Providing education and feedback from targeted audits.
- Specific resident/responsible parties requesting antibiotics frequently?

Preparing for Difficult Conversations

- What is your goal? Write it down.
- Develop talking points for your conversation and points underneath each if needed.
- Practice active listening.
- Provide education and agree to follow up with them post conversation.

Resources

- [Infection Prevention and Control Resources: Antibiotic Stewardship](#), Superior Health
- [Toolkit To Improve Antibiotic Use in Long-Term Care](#), AHRQ
- [Antimicrobial Stewardship](#), APIC
- [Be Antibiotic Aware Word Search](#), QSource
- [Antibiotic Tracking and Reporting in Nursing Homes: Part I](#), Wisconsin Department of Health Services (DHS)
- [Antimicrobial Resources for Long Term Care](#), MDH
- CDC:
 - [Continuing Education and Informal Resources](#)
 - [Core Elements of Antibiotic Stewardship for Nursing Homes](#)
 - [The Discovery of Penicillin—New Insights After More Than 75 Years of Clinical Use](#)

Questions?

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Continue the Conversation in Superior Health Connect



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