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

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A B S T R A C T

In response to a rising concern for multidrug resistance and *Clostridium difficile* infections, the Centers for Medicare and Medicaid services (CMS) will require all long-term care (LTC) facilities to establish an antibiotic stewardship program by November 2017. Thus far, limited evidence describes implementation of antibiotic stewardship in LTC facilities, mostly in academic- or hospital-affiliated settings. To support compliance with CMS requirements and aid facilities in establishing a stewardship program, the Infection Advisory Committee at AMDA—The Society for Post-Acute and Long-Term Care Medicine, has developed an antibiotic stewardship policy template tailored to the LTC setting. The intent of this policy, which can be adapted by individual facilities, is to help LTC facilities implement an antibiotic stewardship policy that will meet or exceed CMS requirements. We also briefly discuss implementation of an antibiotic stewardship program in LTC settings, including a list of free resources to support those efforts.
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As part of the revised Requirements for Participation, the Centers for Medicare and Medicaid Services (CMS) will require all long-term care (LTC) facilities to have an antibiotic stewardship program by November 28, 2017.[1,2] The impetus for this new federal requirement arose in part from the recognition of the over 2 million infections. caused each year by multidrug resistant organisms (MDROs) and *Clostridium difficile*.[3,4] Being a resident in a nursing home is one of the most notable risk factors for colonization with an MDRO.[5] Some estimates indicate that the rate of methicillin-resistant *Staphylococcus aureus* colonization among nursing home residents may exceed 50%,[6,7] surpassing the estimated rate of 5%–10% among hospitalized patients.[8,9] Alarmingly, recent studies reported that colonization with multidrug-resistant Gram-negative bacilli among nursing home residents ranges from 20% to 30%.[10–12] In addition, the proportion of nursing home residents colonized with *C difficile* ranges from 4% to 50%.[13–15]

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Antibiotic exposure drives selection for MDROs and *C difficile* infection. In LTC residents, antibiotics are often prescribed inappropriately (ie, inappropriate choice, dose, route or duration) and unnecessarily (eg, treatment of asymptomatic bacteriuria or viral upper respiratory tract infection). In 1987, Jones et al[16] found that 50% of antibiotics prescribed in 2 community nursing homes were inappropriate or unjustified. Twenty-five years later, Peron et al[17] reported similar results, deeming 40% of antibiotic days of therapy at a Veterans Affairs nursing home as inappropriate or unnecessary. Antibiotic use leads to adverse effects for LTC residents,[6,18–20] including those who do not actually receive the antibiotics[21] and populations accessing healthcare facilities in the same community.[22,23]

Antibiotic stewardship, which seeks to minimize inappropriate and unnecessary antibiotic use, is a critical part of combating antibiotic-resistant bacteria. In acute care settings, antibiotic stewardship programs show efficacy in improving patient outcomes, reducing the incidence of *C difficile* infections and, in some cases, decreasing the prevalence of some strains of antibiotic-resistant bacteria.[24–28] The evidence and experience describing successful antibiotic stewardship is sufficient to support guidelines for developing and implementing antimicrobial stewardship programs in acute care settings.[29,30] In comparison, relatively few studies describe effective antibiotic stewardship implementation in LTC settings, the majority of which occur in academic- or hospital-affiliated nursing homes.[31–33] For most community LTC settings, lack of knowledge, evidence, and experience are notable barriers to implementing antibiotic stewardship programs. Nonetheless, the CMS requirements for participation state that LTC facilities must establish an antibiotic stewardship program that includes antibiotic use protocols and a system to monitor antibiotic use (Section §483.80 Infection Control).[1]

AMDA—The Society for Post-Acute and Long-Term Care Medicine (The Society) received numerous requests for assistance with an antibiotic stewardship policy and also strongly endorses antibiotic stewardship in the care of LTC residents. To support compliance with the impending CMS requirements for participation, The Society's Infection Advisory Committee convened a panel of experts to review the requirements for participation, focusing on antibiotic stewardship. Here, we share a template of an antibiotic stewardship policy tailored to LTC settings (Box 1) and briefly discuss implementation. To develop the antibiotic stewardship policy template, the authors drew upon resources from academic and authoritative institutions including the Centers for Disease Control and Prevention, the Agency for Healthcare Research and Quality, the Society for Healthcare Epidemiology of America, and the Infectious Disease Society of America. Appendix 1 provides a crosswalk between the antibiotic stewardship policy template and the explanatory text included in the CMS State Operations Manual, which provides guidance to surveyors for LTC facilities.[2] Appendix 2 contains antibiotic use protocols developed with funding from Agency for Healthcare Research and Quality for urinary tract infections, skin and soft tissue infections, and lower respiratory tract infections.[34] Table 1 contains links to these and other resources relevant to antibiotic stewardship in the LTC setting; these tools are also available at The Society's website.

Antibiotic Stewardship Policy Template

The policy template calls for the formation of a multidisciplinary antibiotic stewardship committee at each LTC facility. Ideally, the committee should include, at a minimum, the director or assistant director of nursing, the medical director or designee, the infection preventionist, and the consultant or dispensing pharmacist. The committee chair should be an individual with leadership skills who is dedicated to quality improvement. When possible, the LTC facility should support and facilitate advanced training in antibiotic stewardship for the committee chair. In most settings, the medical director, or a designated physician, is a reasonable choice for this role.

Infection preventionists, who are responsible for the infection prevention and control program, will also be important member of the antibiotic stewardship committee. The policy template specifies dedicated time and effort for an infection preventionist to carry out antibiotic stewardship activities, as these are distinct from the work involved with leading the infection prevention and control program. CMS anticipates that a licensed pharmacist will support assessment, monitoring, and communication about antibiotic use as part of the medication regimen review.[2] Other potential members include frontline staff (ie, nurses, nursing assistants), an administrator, a board member or designee, and a representative from the resident and family council. Finally, some LTC settings may need to look outside of their facility to identify people with expertise in antibiotic stewardship. These individuals may have the knowledge and skillsets that permit LTC facilities to develop a facility-specific prescribing guideline or a facility-specific antibiogram.

The functions of the antibiotic stewardship committee include reviewing antibiotic use data, identifying targets for stewardship, tracking outcomes data to assess change, and sharing an annual written report with facility personnel, the Quality Assessment and Assurance Committee and, where applicable, the resident and family council. In addition, the antibiotic stewardship committee should communicate antibiotic stewardship activities and protocols to the prescribing practitioners and medical and nursing staff, and provide education related to antibiotic stewardship, including appropriate antibiotic use, to prescribing practitioners, and medical and nursing staff as well as to residents and families. The antibiotic stewardship committee may have some reasonable overlap with the infection prevention and control committee but must also have distinct responsibilities and activities.

Antibiotic Use Protocols

Antibiotic use protocols should take into account diagnostic criteria for common infections, appropriate diagnostic tests, and length of treatment along with choosing appropriate empiric therapy. The antibiotic stewardship committee may choose to develop their own antibiotic use protocols or adapt them from standardized tools and criteria, some of which CMS suggests in the State Operations Manual.[2] The antibiotic stewardship policy should specify the document(s) detailing the antibiotic use protocols.

A consensus guideline published in 2001 by Loeb et al.[35] describes the minimum diagnostic criteria for starting antibiotics in nursing home residents. These criteria, which are prospective and account for residents' clinical status, include recommendations for a focused assessment and diagnostic tests accessible in most nursing home settings. The 2012 revised McGeer (Stone) criteria specify surveillance definitions to measure rates of infections for epidemiologic purposes.[36] Familiar to many nurses, the definitions offer a concise list of criteria for several infections common to LTC residents. Although central to surveillance of common infections in LTC settings, the revised McGeer (Stone) criteria do not supplant the Loeb minimum criteria for initiating antibiotics in a nursing home resident with clinical signs and symptoms suggestive of infection.

Antibiotic use protocols can also provide guidance on appropriate indications for ordering diagnostic tests. For example, in LTC settings, the results of urine cultures, rather than clinical symptoms, often spurs unnecessary antibiotic use.[37] Educating and coaching LTC clinical staff about appropriate indications for ordering urine studies, reduces unnecessary antibiotic use for

Box 1. Antibiotic Stewardship Policy

Effective: (date)
Review Responsibility: (by role)
Review/Revision: (dates)

Centers for Medicare and Medicaid Services (CMS) Requirement

Long-term care facilities must develop an Infection Prevention and Control Program (IPCP) that includes an Antibiotic Stewardship Program and designate at least one Infection Preventionist (IP). Antibiotic stewardship programs should include antibiotic use protocols and systems for monitoring antibiotic use. (§ 483.80)

Policy Statement

The policy establishes directives for antimicrobial stewardship at (insert facility name) in order to develop *antibiotic use protocols and a system to monitor antibiotic use*.

Governance of Antimicrobial Stewardship

As part of the Infection Prevention and Control Program (IPCP), (insert facility name) has established a committee to oversee antimicrobial stewardship functions. The Infection Preventionist (IP), who is responsible for the overall IPCP, is an integral part of this committee.

The Antibiotic Stewardship Committee will meet at least quarterly and review this policy annually and as needed.

Composition

1. An Antibiotic Stewardship Committee has been established and is composed of the following personnel: (should include at least 2 staff members; adjust as needed to suit your facility)
   a. Infection Preventionist (IP) (*required*)
   b. Director or Assistant Director of Nursing
   c. Medical Director or a designated physician (*required*)
   d. Consulting and/or Dispensing Pharmacist (*required*)
   e. Administrator
   f. Attending Physician or Nurse Practitioner or Physician Assistant
   g. Nurse
   h. Nurse Aide
   i. Allied Health Professional
   j. Representative from the Resident and Family Council
2. The IP will incorporate antibiotic stewardship into their current activities and will allocate dedicated time (10 hours/week) specifically for antimicrobial stewardship activities. The IP's primary professional training is in nursing, medical technology, microbiology, or epidemiology, or other related field. The IP is qualified by education, training, experience or certification and, by November 28th 2019, will have completed specialized training in infection prevention and control. The IP works at the facility full-time/part-time.
3. The Director of Nursing, Medical Director and Administrator for (insert facility name) are responsible for ensuring that adequate staffing and resources are allocated to support the functions and efforts of the IP and the Antibiotic Stewardship Committee. The determinations for adequate staffing and resources will be informed by the facility assessment used to establish and update the IPCP. (483.70(e))

Procedures

A. The Antibiotic Stewardship Committee will:

1. Support and promote antibiotic use protocols which include:
   a. Assessment of residents for infection using standardized tools and criteria. The criteria used by this facility are (adapted from the Loeb Minimum Criteria, the revised McGeer Criteria or specify written protocol detailing criteria developed by the facility).
   b. Therapeutic decisions regarding antibiotic prescriptions based on evidence (eg, guidelines and consensus statements from clinical and academic societies) that is appropriate for the care of long-term care facility residents.
   c. Specifying a dose, duration and indication on all antibiotic prescriptions.
   d. Reassessment of empiric antibiotics after 2-3 days for appropriateness and necessity, factoring in results of diagnostic tests, laboratory reports and/or changes in the clinical status of the resident.
   e. Whenever possible, choosing narrow-spectrum antibiotics that are appropriate for the condition being treated.
2. Develop and maintain a system to monitor antibiotic use, which includes:
   a. Review antibiotics prescribed to residents upon their admission or transfer to the facility and those during the course of evaluation by a prescribing practitioner who is not part of the facility's staff (eg, emergency department provider, specialty provider).
   b. Periodically (quarterly) review a subset of antibiotic prescriptions for inclusion of dose, duration and indication (or for length of therapy, documentation of an antibiotic time-out, appropriateness based on antibiotic use protocols and written documentation of clinical justification for antibiotic use that does not comply with the facility antibiotic use protocols). Periodically review rates of prescriptions for any antibiotics or conditions identified by the committee as being of special interest.
   c. At least annually, review antibiotic use data by the facility and by individual providers to determine if there is excessive use of specific antimicrobial agents. The assessment will measure antibiotic starts (antibiotic days of therapy, defined

daily doses of antibiotics) per 1000 resident days of care (and/or length of therapy). If excessive use or other conditions are identified, the facility will take actions to address these problems.
   d. At least annually, provide feedback on the facility's antibiotic use data in the form of a written report shared with administration, medical and nursing staff, allied health professionals, the resident and family council and the Quality Assessment and Assurance (QAA) committee. The reports will include recommendations from the Antibiotic Stewardship Committee regarding facility-level antibiotic use practices.
   e. At least annually, provide feedback on each provider's antibiotic use data in the form for a written report shared with the provider. The provider must acknowledge the report in writing.

3. Develop and maintain a system to monitor resistance data, which will:
   a. At least annually, review surveillance data pertaining to microorganisms related to antibiotic use (eg, methicillin-resistant *Staphylococcus aureus* carbapenemase-resistant *Enterobacteriaceae* spp. (CRE) or *Clostridium difficile*).
   b. At least annually, provide feedback on surveillance data pertaining to microorganisms related to antibiotic use in the form of a written report shared with administration, medical and nursing staff, allied health professionals, the resident and family council and the Quality Assessment and Assurance (QAA) committee.

4. Provide education on antibiotic stewardship, which will:
   a. At least annually, provide education on antibiotic stewardship and on the facility's antibiotic use protocols to prescribing practitioners, medical and nursing staff. The mode (eg, written, verbal, online) and frequency of the education shall be documented.
   b. Support the development or selection of educational materials about antibiotic stewardship and support dissemination of these materials to residents, their family members and friends and the resident and family council.

5. Serve as a resource and support for the IP, the consultant or dispensing pharmacist and other medical and nursing staff around antibiotic stewardship activities, including education and identifying opportunities for improvement relevant to antibiotic stewardship

6. Meet at least quarterly to:
   a. Review general activities related to antibiotic stewardship, antibiotic use data and other data or materials shared by committee members, representatives from the ICPC or from administration, medical and nursing staff, allied health professionals or the resident and family council.
   b. Identify opportunities for improvement relevant to antibiotic stewardship and develop actions plans to make those improvements.
   c. Review progress on action plans.

B. *The Medical Director or designated physician will:*
1. Serve as the primary medical point of contact for the Antibiotic Stewardship Committee and serve as liaison between the Committee and the other medical staff members
2. Assist in development of policies, procedures and protocols related to antibiotic stewardship and facility-specific antibiotic use protocols for the management of common infections.
3. At least annually, review this antibiotic stewardship policy and antibiotic use protocols and make recommendations for changes to the Antibiotic Stewardship Committee based on current clinical practice guidelines and other relevant, current clinical evidence.
4. Play an active role in planning, developing or arranging antibiotic stewardship related educational activities for prescribing practitioners, nursing staff, residents and families.
5. Play an active role in providing individualized feedback to prescribing practitioners, including their compliance with facility antibiotic use protocols.

C. *The Consulting and/or Dispensing Pharmacist will review antibiotics prescribed to residents during their monthly medication review, considering both ongoing and completed courses. The Consulting and/or Dispensing Pharmacist will also make recommendations to the Antibiotic Stewardship Committee based on the review.*

catheterized residents.[38] Incorporating the revised McGeer (Stone) criteria into an antibiotic use protocol that describes indications for ordering diagnostic studies may help support overall antibiotic stewardship efforts.

Antibiotic use protocols may use evidence-based guidelines to support recommendations for length of therapy. Most infections common to LTC residents, including urinary tract infections, pneumonia, and cellulitis, require no more than 7 days of antibiotics.[39–42] For situations when it is unclear if clinical changes are due to infection, implementing an order set for active monitoring (formerly watchful waiting) of residents' clinical status provides a tool that would help avoid unnecessary antibiotic therapy.[43] Appropriate use of such order sets, which includes documentation in the medical record, would demonstrate strong facility-level commitment to antibiotic stewardship.

Selecting appropriate empiric antibiotic therapy is a more challenging area to suggest specific policies, as they must account for local patterns of antibiotic resistance and clinical practice. For all guidelines, policies and order sets, clinical judgment is paramount; decisions to treat outside of standard protocols require additional, albeit brief, documentation.

Antibiotic Resistance Data and Antibiograms

The CMS State Operations Manual suggests tracking *C difficile*, methicillin-resistant *Staphylococcus aureus*, and carbapenemase-resistant *Enterobacteriaceae* as a means to monitor resistance data, activities that may already be carried out under the purview of the Infection Prevention and Control Program.[2] Many factors influence the prevalence of these and other MDROs in the LTC setting, including the prevailing rate in the community, the types of care and services provided (eg, residents with feeding tubes or chronic wounds) and local adherence to infection prevention and control measures.[44,45] Accordingly, fluctuations in the rates of MDROs within an individual LTC setting may occur independently of even the most stringent IPCP and antibiotic stewardship programs.

Table 1
Resources for Antibiotic Stewardship in LTC

Category	Institution	Resource (type of link)
General Antibiotic Stewardship Principles	CDC[a]	The Core Elements of Antibiotic Stewardship for Nursing Homes (website)
		Core Elements of Antibiotic Stewardship for Nursing Homes (pdf)
		Checklist for the Core Elements of Antibiotic Stewardship for Nursing Homes (pdf)
	AHRQ	Nursing Home Antimicrobial Stewardship Guide (website)
	AHS and BC CDC	Do Bugs Need Drugs? (website)
	Rochester Patient Safety *C difficile* Prevention Collaborative	Rochester Nursing Home Collaborative (website)
	Minnesota Department of Health	Minnesota Antimicrobial Stewardship Program Toolkit for Long-term Care Facilities (website)
		Antimicrobial Stewardship in Long-Term Care (pdf)
	Massachusetts Coalition	Evaluation & Treatment –UTI in Elderly (website)
	University of North Carolina	Promoting Wise Antibiotic Use in Nursing Homes (pdf)
Policy and Implementation	CDC	Policy and Practice Actions to Improve Antibiotic Use (pdf)
		Leading Antibiotic Stewardship in Nursing Homes (pdf)
		Creating a Culture to Improve Antibiotic Use in Nursing Homes (pdf)
	AHRQ	Starting an Antimicrobial Stewardship Program (website)
		Monitor and Sustain Stewardship (website)
	Minnesota Department of Health	Action Steps and Strategies for Implementing Antimicrobial Stewardship in Long-term Care Facilities (pdf)
		Antimicrobial Stewardship Gap Analysis Tool (pdf)
	New York Department of Health	The Core Elements of Antibiotic Stewardship with CMS and QAPI Updates (pdf)
Antibiotic Use Protocols	AHRQ	Common Suspected Infections: Communication and Decision Making for Four Infections (website)
		Suspected UTI SBAR Toolkit (website)
		Minimum Criteria for Common Infections Toolkit (website)
		Protocol for Three Common Infections (word document; also included as Appendix 2)
	Rochester Patient Safety *C difficile* Prevention Collaborative	Managing Common Infections in Older Adults (pdf)
		Guidelines for Treatment of Urinary Tract Infections (pdf)
	Minnesota Department of Health	Minimum Criteria for Initiation of Antibiotics in Long-Term Care Residents (pdf)
	Massachusetts Coalition	ABCs for Diagnosing Urinary Tract Infection in Long Term Care (pdf)
Measuring and Monitoring Antibiotic Use	CDC	Measures of Antibiotic Prescribing, Use and Outcomes (pdf)
	AHRQ	Working With Your Lab to Improve Antibiotic Prescribing (website)
		Using Nursing Homes Antibiograms to Choose the Right Antibiotic (website)
	Rochester Patient Safety *C difficile* Prevention Collaborative	Antibiotic Tracking Worksheet (excel file)
		Antibiotic Tracking Sheet Instructions for Use (word document)
		Antibiotic Order Sheet Template (pdf)
	Minnesota Department of Health	Antimicrobial Use Assessment for Long-term Care Facilities (pdf)
		About Antibiograms (pdf)
	World Health Organization	WHONET Collaborating Centre for Surveillance of Antimicrobial Resistance (Website)
Family and Resident Education	CDC	What to Ask Your Healthcare Provider about Antibiotics (pdf)
		What You Need to Know About Antibiotics in a Nursing Home (pdf)
	AHRQ	Toolkit to Education and Engage Residents and Family Members (website)
		Be Smart About Antibiotics (pdf)
		Talking With Residents (pdf)
		Talking With Residents' Family Members (pdf)
		Resident Information Sheet: Antibiotic-Resistant Bacteria(pdf)
	ABIM	AMDA Choosing Wisely List (pdf)
		AGS Choosing Wisely List (website with pdfs)
		Tests & treatments for UTIs in older people – When you need them and when you don't (website with pdfs)
	AHS and BC CDC	FAQ for Families, Guardians and Health Care Aides-UTI in LTCF (pdf)
		FAQ for Families, Guardians and Health Care Aides-NHAP in LTCF (pdf)
	Rochester Patient Safety *C difficile* Prevention Collaborative	Antibiotics for Urinary Tract Infections in Older Adults (pdf)
		Asymptomatic Bacteriuria Family Letter Template (pdf)
	University of North Carolina	Why Not Antibiotics? (pdf)

ABIM, American Board of Internal Medicine; AGS, American Geriatrics Society; AHRQ, Agency for Healthcare Research and Quality; AHS, Alberta Health Services; BC CDC, British Columbia Center for Disease Control; CDC, Centers for Disease Control and Prevention; UTI, urinary tract infection.

Antibiograms present an additional means to measure antibiotic resistance data. When feasible, we encourage LTC facilities to work with their laboratory to develop a facility-specific antibiogram. These typically accrue antibiotic susceptibility patterns of bacterial isolates collected over the previous year. The Clinical and Laboratory Standards Institute (CLSI) requires at least 30 isolates collected from diagnostic (not surveillance) specimens for inclusion of a bacterial species in an antibiogram.[46] Recognizing that the most frequently cultured substance is urine, some laboratories may only have sufficient data to develop an antibiogram specific to urine. Some smaller LTC facilities send so few cultures that there are insufficient numbers of bacterial isolates to generate even a urine antibiogram. Should this occur, we suggest documenting regular efforts to develop an antibiogram, perhaps every 1–2 years, into records kept by the Antibiotic Stewardship Committee.

Measuring and Monitoring Antibiotic Use

A system to monitor antibiotic use requires measuring and reporting antibiotic use. This in turn permits identification of potential goals for the antibiotic stewardship program and tracking progress toward those goals. Several metrics capture antibiotic use including days of therapy, defined daily doses, and antibiotic starts, all reported as rates per 1000 resident days of care (Table 2). Days of therapy/1000 resident days provides the most accurate information on antibiotic use.[47,48] Unfortunately, routine and reasonably accurate collection of these data may not feasible for programs without a dedicated LTC pharmacy staff and information technology support. The World Health Organization established defined daily doses for antibiotics, based on the average dose used to treat most infections in most adults.[49] In addition to notable concerns regarding inaccurate

Table 2
Comparison of Antibiotic Use Metrics

Metric	Definition	Pros	Cons
Days of therapy	Any dose of antibiotic given on a single day per 100 (or 1000) resident days	Used by the National Healthcare Safety Network. Tracks efforts to lower antibiotic use rates. Estimates total burden of antibiotic use.	Does not measure length of treatment. May be labor intensive. Skewed by long-term prophylactic antibiotics
Defined daily dose	Standardized doses of antibiotics per 100 (or 1000) resident days	World Health Organization standardized measures of antibiotics	Labor intensive. Definitions change with time. Does not readily accommodate dose adjustments made based on age, weight, or creatinine clearance.
Antibiotic starts	Number of new antibiotic prescriptions per mo or per 100 (or 1000) resident d	Measures frequency of prescribing. Tracks efforts to lower antibiotic prescriptions rates. Tracks prescribing for specific indications (eg, urinary tract infection)	Does not measure total antibiotic burden. Does not measure length of treatment. May overestimate antibiotic use if antibiotics are changed (ie, based on results of laboratory tests)
Number of antibiotic courses >7 d	Number of antibiotic prescriptions for duration >7 d per mo	Tracks efforts to reduce excessive length of prescriptions.	Does not measure the frequency of overall antibiotic prescriptions.

estimates of antibiotic use, measuring defined daily doses is also labor intensive. For LTC facilities lacking access to data that captures days of therapy/1000 resident days, we suggest counting antibiotic starts (ie, the number of new antibiotic prescriptions) each month or per 1000 resident days.[50] When used consistently, the metrics chosen should indicate the effect of interventions to reduce antibiotic use over time and may, therefore, be helpful for evaluating compliance with initiating antibiotics in the LTC setting and thus in meeting regulatory requirements. Regardless of the metrics used, we recommend that the IP and the consulting or dispensing pharmacist work together to collect, analyze, and share these data with the Antibiotic Stewardship Committee.

Antibiotic use data, particularly when coupled with the indications for prescribing, can help identify and monitor a target for improvement. In addition to overall rates of antibiotic use, considering specific classes of antibiotics or length of therapy may suggest additional interventions. For example, LTC facilities struggling with *C difficile* infections may wish to assess use of high-risk antibiotics, namely clindamycin, fluoroquinolones, cephalosporins, monobactams, and carbapenems.[51] Regarding length of therapy, given that most common infections require no more than 7 days of antibiotic therapy,[39–42] examining antibiotic prescriptions for length of therapy may also reveal targets for intervention. Finally, LTC facilities may consider assessing antibiotic prescribing practices of individual prescribing practitioners to identify potential outliers for number of prescriptions, spectrum of agents used, or length of therapy. These data must be interpreted judiciously, however, because in LTC settings, attribution of prescriptions to a specific prescriber may be inaccurate. For example, medications initiated by an on-call prescribing practitioner may be attributed to the primary care provider and Ebox medications to the medical director.

CMS specifies that feedback to providers is an additional facet of monitoring antibiotic use.[2] To that end, the antibiotic stewardship template describes sharing aggregate antibiotic use data with all staff as well as providing individualized feedback to prescribing practitioners. The individualized feedback should include a written report, provided at least annually, that encompasses overall antibiotic use as well as compliance with antibiotic use protocols, such as including dose, duration, and indication with each prescription or documenting the receipt and, when applicable, response to the results of diagnostic tests and laboratory studies.

Implementation

To begin, we suggest that LTC settings conduct a focused assessment of their ongoing antibiotic use. In most cases, the infection preventionist, consultant pharmacist, dispensing pharmacist, director of nursing, or medical director likely already has some awareness of opportunities for improvement. As emphasized by the Centers for Disease Control and Prevention in their Core Elements for Antibiotic Stewardship in Nursing Homes, antibiotic stewardship programs should start small and identify targets that are readily measured and amenable to change.[52] Possible targets include process measures, such as requiring that every antibiotic prescription includes the dose, duration, and indication. Readily quantified, efforts to improve these specific measures should be feasible in most settings and are readily shared with staff members as an important feature of regulatory compliance. Additional targets include unnecessary antibiotic use, such as prescriptions written for asymptomatic bacteriuria, chronic suppression of urinary tract infections, dental prophylaxis, or "prophylactic" antibiotics during respiratory viral outbreaks. Other potential targets are to improve antibiotic utilization by reducing excessive length of therapy, use of agents associated with a high risk for *C difficile* infection (eg, clindamycin, quinolones) or use of broad-spectrum agents (eg, carbapenems, extended-spectrum cephalosporins). For each of the potential targets mentioned, documentation of the measures at baseline and after implementing a change, along with a concise description of the time and nature of the change implemented, will help demonstrate an active antibiotic stewardship program.

Antibiotic Time-Out

A key component to antibiotic stewardship is to reassess the need for and appropriateness of antibiotics 2–3 days after initiation.[53] Dubbed an "antibiotic time-out," this is an opportunity for staff to consider results of diagnostic tests, assess the resident for clinical changes, and consider alternative diagnoses. Subsequently, the prescribers may choose to narrow, shorten, or stop antibiotic therapy altogether. Consistent implementation of antibiotic time-outs may not be feasible for LTC settings that are implementing antibiotic stewardship for the first time. It should, however, be incorporated into programs as they mature.

Education

Multidisciplinary education is an important aspect of implementing a successful antibiotic stewardship program in LTC facilities.[33] Specific topics include the appropriate indications for prescribing antibiotics, length of therapy, and the potential risk and benefits of antibiotics as well as adjusting antibiotics in response to the results of diagnostics tests and laboratory data. As the protocols for antibiotic use address these same topics, introducing those

protocols is an opportunity to educate prescribing practitioners, nurses, and other clinical staff. Presenting the facility's antibiotic use and resistance data in the context of general antibiotic stewardship principles presents a further opportunity for education that might include all staff members. Finally, educational efforts should also embrace residents, their families, and concerned loved ones. Incorporating information about antibiotic stewardship into the admission packet, prominently displaying a commitment letter and making pamphlets and other reading material about antibiotic stewardship available in common areas through the facility are all feasible strategies; Table 1 contains links to several free resources.[54]

Additional Considerations

LTC facilities seeking to use this template should adapt and tailor it to suit the needs of their individual building, which will have a wide array of resources, time, and expertise available to support antibiotic stewardship. Similarly, antibiotic use protocols must also account for the setting into which they are introduced and should not override clinical judgment.

The intent of the antibiotic stewardship policy template provided here is to help LTC settings institute quality antibiotic stewardship programs as they seek to comply with impending regulatory changes in the context of limited evidence to describe antibiotic stewardship implementation in these settings. Recognition of ongoing efforts, such as infection prevention and control protocols, communication tools, educational materials for resident and families as well as feedback to prescribing practitioners, may be incorporated into the policy. Through the accumulation of both evidence and experience, antibiotic stewardship in LTC settings will help reduce the prevalence of MDROs and *C difficile* as well as the risk of adverse drug events and ultimately, improve resident safety.

Supplementary Data

Supplementary data related to this article can be found online at http://dx.doi.org/10.1016/j.jamda.2017.07.018.

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