NATIONAL QUALITY FORUM

National Quality Partners Playbook™:

ANTIBIOTIC STEWARDSHIP IN POST-ACUTE AND LONG-TERM CARE

NATIONAL QUALITY PARTNERS PLAYBOOK™: ANTIBIOTIC STEWARDSHIP IN POST-ACUTE AND LONG-TERM CARE

ABOUT NATIONAL QUALITY FORUM

Founded in 1999 and based in Washington, DC, the National Quality Forum (NQF) is the nation's resource for healthcare quality measurement and improvement. NQF is an independent, not-for-profit, membership-based organization that brings healthcare stakeholders together to recommend quality measures and improvement strategies that reduce costs and help patients get better care. Through its multistakeholder membership of more than 400 organizations, NQF facilitates dialogue on healthcare measurement and improvement and strives to lead national collaboration to improve health and healthcare quality for all Americans.

National Quality Partners™

National Quality Partners™ (NQP™), an NQF initiative, is an active forum for NQF members to connect, collaborate, and provide thought leadership on quality improvement strategies to achieve national health and healthcare quality goals. NQP™ addresses the nation's high-priority healthcare issues by engaging stakeholders from across the care continuum, and leading practical, action-oriented initiatives to drive meaningful and lasting change for patients and their families.

CONTENTS

ACKNOWLEDGEMENTS

NQF gratefully acknowledges the key contributors who provided time and technical expertise to defining the strategies and solutions outlined in the *NQP Playbook™: Antibiotic Stewardship in Post-Acute and Long-Term Care*. NQF also appreciates the project management, facilitation, research, and production leadership provided by Jennifer Bright and Erica deFur Malik of Momentum Health Strategies™.

The conclusions, findings, and opinions expressed by individuals contributing to this publication do not necessarily reflect the official position of the U.S. Department of Health and Human Services, the Public Health Service, the Centers for Disease Control and Prevention, or any contributor's affiliated institution.

Key Informants and Reviewers

Melody Brown
Adrienne Mims
Marilee H. Johnson
Alliant Quality

Joy Seufert
American Health Association Laboratory

Holly Harmon
American Health Care Association

Sue Collier
American Hospital Association Health Research Educational Trust

Joseph Marek
American Society of Consultant Pharmacists

Deb Burdsall
Katrina Crist
Association for Professionals in Infection Control and Epidemiology

Robin Jump
Case Western Reserve University
The Society for Post-Acute and Lon Term Care Medicine
Society for Healthcare Epidemiology of America

Christopher A. Czaja
Colorado Department of Public Health and Environment

Ed Septimus
HCA Healthcare

Brandi Van Valkenburg
Health Direct

Teri Hulett
Infection Prevention Strategies, LLC

Ravina Kullar
Infectious Disease Association of California

Morgan Katz
Johns Hopkins University School of Medicine

Janine Finck-Boyle
LeadingAge

Stephanie DeWees

Susan Wallace
LeadingAge Ohio

Mel Daly
Lorien

Lucy Wilson
Infectious Disease Epidemiology and Outbreak Response Bureau
Prevention and Health Promotion Administration
Maryland Department of Health

Rita Olans
Massachusetts General Hospital Institute of Health Professions

Amanda Beaudoin
Minnesota State Department of Public Health

Lori Smetanka
National Consumer Voice for Quality Long-Term Care

Sherrie Dornberger
Cindy Fronning
The National Association of Directors of Nursing Administrators

Swati Gaur
New Horizons
The Society for Post-Acute and Long-Term Care Medicine

Gary Erwin
Omnicare

Dolly Greene
Rockport Healthcare Services and Infection Prevention & Control Resources

Steven J. Schweon
Shira Doron
Society of Healthcare Epidemiology of America

Libby Dodds Ashley
Society of Infectious Diseases Pharmacists

Kelly O'Neill
Marilyn Reierson
Stratis Health

Jane Brock
Kaylie Doyle
Adrienne Mihelic
David Reynolds
Telligen

Christopher E. Laxton
Cari Levy
Mary Mulligan
David Nace
Heidi White
The Society for Post-Acute and Long-Term Care Medicine

Cindi Raymond
Trinity Health

Kavita K. Trivedi
Trivedi Consults, LLC

Muhammad S. Ashraf
University of Nebraska Medical Center
Society for Health Epidemiology of America

Emily Heil
University of Maryland School of Pharmacy
Society of Infectious Diseases Pharmacists

Dallas Nelson
University of Rochester

Ghinwa Dumyati
University of Rochester Medical Center
Rochester Nursing Homes Collaborative

Chris Crnich
University of Wisconsin School of Medicine and Public Health
William S. Middleton Memorial Veterans Hospital

Marisa D'Angeli
Washington State Department of Health

Samantha Mullins
West Virginia State Department of Health

Sponsors[a]

The *NQP Playbook™: Antibiotic Stewardship in Post-Acute and Long-Term Care* was made possible with support from the following organizations:

- bioMérieux
- HCA Healthcare
- Premier, Inc.

a The Sponsors were not involved in the development, review or approval of this *NQP Playbook™*

THE NATIONAL URGENCY FOR ANTIBIOTIC STEWARDSHIP IN POST-ACUTE AND LONG-TERM CARE

Antibiotics have transformed healthcare around the world with their ability to treat previously life-threatening infections, but overuse and misuse of these lifesaving medications is contributing to the emergence of increasing numbers of antibiotic-resistant organisms. The U.S. Centers for Disease Control and Prevention (CDC) estimates that antibiotic-resistant bacteria lead to 23,000 deaths and 2 million illnesses each year.[1] Global concern about antibiotic resistance combined with a small pipeline of new antibiotics has increased the need for antibiotic stewardship to protect the lifespan of antibiotic therapies that are still effective.[2,3,4,5,6] Antibiotic stewardship programs (ASPs) aim to provide every patient with the right antibiotics, at the right time, at the right dose, and for the right duration. In acute care settings, these programs are linked to improved patient outcomes and reductions in adverse events, but implementation in other healthcare settings is in its early stages.[7,8] In April 2018, the Association for Professionals in Infection Control and Epidemiology (APIC), the Society for Healthcare Epidemiology of America (SHEA), and Society of Infectious Diseases Pharmacists (SIDP) issued a joint position paper highlighting the need to increase attention on antibiotic stewardship and infection prevention across multiple healthcare settings.[9]

Antibiotic Stewardship refers to a set of commitments and actions designed to optimize the treatment of infections while reducing the adverse events associated with antibiotic use.[10]

Post-acute and long-term care settings (e.g., nursing homes, assisted living facilities, and post-acute care rehabilitation settings) are garnering particular attention in the efforts to expand antibiotic stewardship programs. Approximately 156,000 CMS-certified nursing homes operate in the United States, and more than 3 million Americans receive care or reside in a nursing home every year, but up-to-date data on antibiotic use in this setting is limited. Available information suggests that 50 to 70 percent of nursing home residents receive an antibiotic each year, and as much as 75 percent of the antibiotics in these settings are prescribed inappropriately.[11,12]

Responding to the threat that inappropriate antibiotic use poses to quality of care and resident safety, CMS updated the conditions of participation for long-term care facilities to include requirements that facilities receiving Medicare or Medicaid payments develop an infection prevention and control program (IPCP) that includes an ASP, and designates at least one infection preventionist (IP) as part of their overall quality improvement efforts.[13] Establishing these new requirements represents a first step towards ensuring appropriate antibiotic use within post-acute and long-term care settings.

Antibiotic Stewardship Challenges in Post-Acute and Long-Term Care Facilities

Post-acute and long-term care settings vary in significant organizational and cultural ways from acute care settings and require different strategies to implement antibiotic stewardship. Some of the challenges that post-acute and long-term care facilities may face when implementing antibiotic stewardship are listed in Box 1.[14,15]

direct care staff frequently need to relay residents' symptoms to prescribing clinicians on the phone and in email. In particular, experts in the field emphasize the critical importance of nursing staff for the implementation of quality improvement efforts like antibiotic stewardship.[17,18]

High staff turnover, particularly among nursing staff, is an added challenge to the sustainability of any quality improvement initiatives. Successful approaches must therefore focus on embedding

BOX 1 Challenges in Post-Acute and Long-Term Care Facilities

- Conflicting expectations with resident/family preferences and antibiotic treatment
- Off-site prescribers, pharmacists, pharmacies, and/or diagnostic and laboratory services
- Variation in access to technology and data expertise
- Lack of staff training on antibiotic stewardship or dedicated time for stewardship activities
- Lack of implementation guidelines to meet facility-specific needs
- High staff turnover

While the home-like atmosphere and long-term relationships between residents, family members, and providers can foster communication about treatment decisions and care, this culture also presents challenges. The desire to "do something" when residents experience a change in condition can put pressure on both direct care staff and prescribing clinicians to start an antibiotic even when there are no clear symptoms of infection. These factors require creative approaches to engaging residents and families as champions of antibiotic stewardship, and make it imperative that all staff who have contact with residents, including nursing assistants, dieticians, and physical therapists, have a basic understanding of the principles of antibiotic stewardship.

Staff in post-acute and long-term care facilities often must conceive of "team" in a broad sense because key team members—such as pharmacists, physicians, and other prescribing clinicians—may only be on site periodically. Some research shows that physicians may spend less than two hours per week at the facility.[16] As a result, infection preventionists, nursing staff, specifically nurses and certified nursing assistants (CNAs), and other

antibiotic stewardship programs into quality and process improvement initiatives already underway. Moreover, such efforts must strengthen the skills and roles of nurses and CNAs as primary communicators between residents and providers and between direct care staff and prescribing clinicians.[19] Post-acute and long-term care facilities often lack access to infectious disease experts, and infection preventionists may not have specific training in stewardship principles and approaches. Technology limitations as well as resource constraints compound these challenges.

With growing recognition that post-acute and long-term care facilities need support to address these challenges and successfully implement an ASP, a rapidly evolving knowledge and experience base can benefit organizations in earlier stages of implementation. In recent years, many resources, toolkits, and collaborative learning initiatives emerged from the CDC, professional societies, and state public health agencies. In 2017, the CDC released the Core Elements of Antibiotic Stewardship for Nursing Homes, a framework for facilities seeking to implement antibiotic stewardship initiatives.[20] This *NQP™ Playbook*

aligns with these Core Elements (see Box 2) and was developed with input from key informants representing stakeholder perspectives of administrators, medical directors, nurses, infection preventionists, consultant and infectious disease pharmacists, public health officials, infectious disease clinicians, and residents and families. This input included over 40 telephone interviews, a focus group strategy session, literature review, and extensive review and comment from national, state, and local experts. From this resource, post-acute and long-term care facilities can gain insight on preferred practices and solutions to common implementation barriers.[21]

BOX 2 CDC Core Elements of Antibiotic Stewardship for Nursing Homes

- Promote Leadership Commitment and Culture
- Establish Accountability
- Take Action on Antibiotic Use
- Advance Drug Expertise to Inform Antibiotic Stewardship
- Track Progress
- Report Performance
- Educate Clinicians and Staff
- Engage and Educate Residents and Families

USING THE NQP PLAYBOOK™

The *NQP Playbook™: Antibiotic Stewardship in Post-Acute and Long-Term Care* provides strategies and implementation examples for organizations and clinicians committed to appropriate use of antibiotics in post-acute and long-term care settings, including nursing facilities and post-acute care rehabilitation facilities.[a] The *NQP Playbook™* identifies a variety of options available to facilities, depending on the organizational resources and needs identified through self-evaluation. It also addresses implementation strategies to meet requirements associated with conditions of participation articulated by CMS. For each Core Element, the *NQP Playbook™* offers a brief overview, implementation strategy examples, potential barriers and suggested solutions, sample tools and resources, and a case study. The strategies not only pertain to antibacterials but also other antimicrobials such as drugs to fight viruses (antivirals), parasites (antiparasitics), and fungi (antifungals). When available, citations for strategies based on recommendations from research studies are provided. The example strategies are organized according to resource intensity. Lower intensity approaches are those that facilities can undertake relatively quickly and with limited resources, or are required to meet the CMS conditions of participation. Higher intensity approaches require more organizational effort, expertise, and clinical, technical, financial, or human resources, but may lead to higher quality and safety and better health outcomes. Facilities need not pursue all implementation strategies across all core elements, nor begin with low intensity approaches first. Rather, facilities can determine the optimal mix of strategies based on their own organizational goals, context, and needs.

The *NQP Playbook™* also outlines customized "Strategies in Action" that propose a curated plan to address two common quality improvement targets in post-acute and long-term care settings (see Appendix A). These "Strategies in Action" offer a suggested path across all of the Core Elements. Facilities can adapt these strategies to implement a structured approach to antibiotic stewardship, strengthen their communication and quality goals, foster community partnership, and document measurable change in patient safety and outcomes that can inform greater investment in stewardship practices.

a Research and recommendations are not based on long-term acute care hospitals, but focused on post-acute and long-term care facilities, such as skilled nursing facilities.

Core Element 1: Leadership Commitment

To succeed at antibiotic stewardship, a post-acute and long-term care facility needs visible and vocal champions who offer ongoing support of antibiotic stewardship practices and integrate antibiotic stewardship as an integral part of the facility's mission to improve quality of care and resident safety. Potential champions include facility owners, administrators, medical directors, directors of staff development, directors of nursing, consultant pharmacists, and infection preventionists. In particular, leaders are essential to ensuring regulatory compliance with CMS conditions of participation. These leaders should clearly communicate antibiotic use expectations to clinical staff, residents, and families; support ongoing assessments of antibiotic use; and identify targeted areas for practice improvement related to antibiotic stewardship. Leaders are also positioned to reach out to community resources to leverage drug and clinical expertise and identify data collection and analysis tools. By investing time and resources into antibiotic stewardship, leaders will ensure that it becomes embedded into ongoing efforts to optimize antibiotic use and resident safety.

Implementation Strategies

LOWER INTENSITY

- Create and share with staff, residents, families, and partners an organizational letter of commitment to antibiotic stewardship.
- Establish a facility policy that defines antibiotic stewardship program goals and expectations.
- Define the roles of the antibiotic stewardship team, designate team leads or "champions," and document in the facility's policies.[22]
- Include the administrator, medical director, and director of nursing in all quality improvement meetings.
- Maintain a standing agenda item during quality improvement meetings for updates on antibiotic stewardship activities.
- Ensure ongoing provider education and training programs for all facility staff include basic antibiotic stewardship and quality improvement concepts.
- Collaborate with community and regional partnerships to secure additional expertise (e.g., quality improvement organizations (QIN-QIOs), laboratories).

HIGHER INTENSITY

- Establish the medical director, administrator, director of nursing, consultant pharmacist, and infection preventionist as visible, vocal champions of facility antibiotic stewardship.
- Set annual stewardship goals, develop strategies for achieving goals, and report successes and failures back to the ASP team.
- Dedicate financial resources to antibiotic stewardship activities (e.g., workforce, information technology, specialized training).
- Codify antibiotic stewardship responsibilities in facility job descriptions for medical director, consultant pharmacist, director of nursing, infection preventionist, and direct care staff.

- Allocate dedicated time for antibiotic stewardship activities, including data tracking, data review, education and training, and remote consultation.
- Offer staff access to certification and/or outside training on antibiotic stewardship skills, such as data interpretation, assessment and diagnosis of infections, and communication skills.[23,24]
- Invest in information technology (IT) resources to facilitate data collection, analysis, and reporting.
- Include specific facility needs for antibiotic stewardship (e.g., detailed antibiotic use report, infectious disease consultation, facility or regional antibiograms, training) in contract negotiations with external pharmacies, laboratories, and referring hospitals.
- Attend local quality improvement collaborative meetings to set community-focused strategies for improved antibiotic use.
- Empower nurse leaders and/or medical directors to help build antibiotic stewardship programs in partnership with collaborative member organizations.[25]
- Recruit and engage resident/family members regularly as participants on the antibiotic stewardship team.

Potential Barriers and Suggested Solutions

Limited support of antibiotic stewardship from facility leaders.

Suggested Solutions

- Share information about the CMS conditions of participation requirements with executives and leaders.
- Share materials and research that show the importance and benefits of antibiotic stewardship. (e.g., improved quality of care, improved outcomes, and better use of scarce resources).
- Share statements on the importance of antibiotic stewardship from professional organizations (see resources in Accountability section).
- Engage resident and family representatives to discuss the effect of improving antibiotic use and prevention of adverse events.
- Identify resources from the regional quality improvement organization (QIN-QIO) and state or local public health departments that can support facility initiatives.
- Share reports with facility leaders on *C. difficile* and multidrug resistant organisms (MDROs) such as MDR E. coli rates, increases in antibiotic resistance, and hospital readmissions due to infections.
- Identify antibiotic use data and share with leadership and the clinical staff to identify areas for quality improvement and cost savings, such as reducing antibiotic use, improving resident outcomes, and reducing adverse events.
- Raise the issue of improving antibiotic use as a standing agenda item at quality improvement meetings.
- If available, share information for opportunities to be on antibiotic stewardship honor rolls[26] or other quality recognition programs administered by hospitals or state agencies.

Facility leaders prioritize or are overwhelmed by other requirements.

Suggested Solutions

- Integrate antibiotic stewardship efforts into existing patient safety and quality improvement efforts.
- Identify first steps that have measurable results or outcomes (e.g., lowering duration of antibiotic use or tracking UTIs).
- Point to existing resources that simplify antibiotic stewardship initiatives, including public health, local or regional collaboratives, and QIN-QIO programs.

Specific aspects of stewardship implementation are perceived as onerous or too expensive.

Suggested Solutions

- Share experience of healthcare collaboratives, where multiple facilities work together on common goals and develop shared resources.
- Point to research demonstrating positive outcomes of effective stewardship programs (see resources below).

Key stewardship personnel are not on-site full-time or do not have capacity to initiate work.

Suggested Solutions

- Empower team champions within nursing, infection prevention, and pharmacist staff.
- Develop staff commitment letter or other statement of team desire to embed stewardship focus in a culture of resident safety.
- Enable antibiotic stewardship committee members to participate in stewardship initiatives virtually (e.g., tele or video conferences).

Suggested Tools and Resources

Sample Letter of Commitment

- Qualis Health. Commitment to the Wise Use of Antibiotics.
- Rhode Island Department of Health. Sample Statement of Leadership Commitment for Antibiotic Stewardship.
- Nebraska Antimicrobial Stewardship Assessment and Promotion Program. Leadership Support Statement Template.

Business Case for Antibiotic Stewardship

- Greater New York Hospital Association United Hospital Fund. Antimicrobial Stewardship Toolkit. Making the Business Case for Antimicrobial Stewardship (p.17).
- Spellberg B. Bartlett JG, Gilbert DN. How to pitch an antibiotic program to the hospital C-suite. *Open Forum Infect Dis.* 2016;3(4):1-5.

Sample Antibiotic Stewardship Policies

- Minnesota Department of Health. Sample Antibiotic Stewardship Policy for Long-Term Care Facilities.
- AHRQ. Nursing Home Antimicrobial Stewardship Guide: Draft Policies & Procedures.
- Jump RLP, Gaur S, Katz MJ, et al. Template for antibiotic stewardship policy for post-acute and long-term care settings. *J Am Med Dir Assoc.* 2017; 18(11):913-920.
- Nebraska Antimicrobial Stewardship Assessment and Promotion Program. Institutional Policy Template for Long-Term Care.

Sample Antibiotic Stewardship Collaborative Materials

- Colorado Hospital Association. Antimicrobial Stewardship Collaborative Commitment Letter.
- Cosgrove, S.E. et al (2014). Guidance for the knowledge and skills required for antimicrobial stewardship leaders. *Infect Control Hosp Epidemiol.* 2014;35(12):1444-1451.

Knowledge and Skill Requirements for Antibiotic Stewardship

- Massachusetts Coalition for the Prevention of Medical Errors. Practice Support & Education Tools for Clinicians in LTC: Discovery and Action Handbook.
- Pew Charitable Trusts. A Path to Better Antibiotic Stewardship in Inpatient Settings: 10 case studies map how to improve antibiotic use in acute and long-term care facilities.
- National Association of Directors of Nursing Administration in Long Term Care (NADONA). Sample Job Description for Infection Preventionist in Long-Term Care Facilities.

Sample Research Studies on Antibiotic Stewardship in Long-Term Care Facilities

- Jump R, Olds D, Jury L, et al. Specialty care delivery: bringing infectious disease expertise to the residents of a Veterans Affairs long-term care facility. *J Am Geriatr Soc.* 2013;61(5):782-787.
- McElligott M, Welham G, Pop-Vicas A, et al. Antibiotic stewardship in nursing facilities. *Infect Dis Clin N Am.* 2017;31:619-638.
- Rahme C, Jacoby J, Avery L. Impact of a hospital's antibiotic stewardship team on fluoroquinolone use at a long-term care facility. Ann Longterm Care. 2016;24(6):13-20.
- McMaughan DK, Nwaiwu O, Hongwei Z, et al. Impact of a decision-making aid for suspected urinary tract infections on antibiotic overuse in nursing homes. *BMC Geriatr.* 2016;16:81.
- Doernberg SB, Dudas V, Trivedi KK. Implementation of an antimicrobial stewardship program targeting residents with urinary tract infections in three community long-term care facilities: a quasi-experimental study using time-series analysis. *Antimicrob Resist Infect Control.* 2015;4:54.

Regulations, Standards, and Guidelines

- CMS Quality, Safety, & Oversight. Guidance to Laws & Regulation Nursing Homes.
- New Antimicrobial Stewardship Standard. *Jt Comm Perspect.* 2016;36(7):1-8.

National Policy Statements on Antibiotic Stewardship

- Manning ML, Septimus EJ, Doss ES, et al. Antimicrobial stewardship and infection preventions—leveraging the synergy. A position paper update. *Am J Infect Control.* 2018;46(4):364-368.
- AMDA. Antibiotic Stewardship Policy for Post-Acute and Long-Term Care Settings.
- ASCP/SIDP. The Essential Role of Pharmacists in Antibiotic Stewardship Programs in Long Term Care Facilities.
- SHEA Policy Statement on Antimicrobial Stewardship
- Moody J, Cosgrove SE, Olmsted R. et al. Antimicrobial stewardship: A collaborative partnership between infection preventionists and health care epidemiologists. *Am J Infec Control.* 2012;40(2):94-5.
- APIC. The APIC Policy Agenda: Antibiotic Stewardship.

CASE STUDY

Fostering Leadership Engagement in Antibiotic Stewardship[b]

At The Highlands at Brighton in New York State, the medical director holds primary responsibility for establishing medical policy and strategy for the facility. The medical director works with all levels of nursing staff, providers, and administration to ensure each team member has the resources and training needed and is capable of upholding quality standards in the care provided to residents and families. The medical director also works with external partners through its participation in the University of Rochester Nursing Home Collaborative. The Collaborative's activities, including the development of regional guidelines and hosting clinical educational sessions, allows participants to develop the skills and knowledge necessary to lead stewardship activities in their own facilities.

Leadership at Highlands is found in the support from its medical director, and in his commitment to fostering a culture of quality and empowering staff throughout the facility to question antibiotic use. With the medical director's support, Highlands carves out dedicated time for staff and invests resources into establishing systems for tracking antibiotic orders and holding providers accountable for appropriate use. Some of the key activities undertaken include:

- Developing an antimicrobial order form that allows providers to document diagnosis and clinical presentation of the resident along with the antibiotic order and stop date. This helps encourage clear justification for prescribing.
- Routinely scheduling a 48-hour follow-up for all residents after antimicrobial prescriptions to assess residents for early cessation of antibiotic use or to adjust prescribing based on clinical course or culture results (e.g., antibiotic timeout).
- Reviewing data on infection rates (monthly) and dispensing data (quarterly) at the monthly Quality Assurance and Improvement (QAI) meeting.
- Building a strong emphasis on consideration of nonbacterial causes of fever, the nonspecificity of portable radiography, and the resolution of many complaints without clear indications for antibiotic use.
- Implementing these practices has contributed to a more than 25-percent reduction in antibiotic use at Highlands due to shortened or discontinued course of treatment.

b Based on an interview on March 12, 2018 with Dr. Joseph Nicholas, medical director at The Highlands at Brighton facility, and Dr. Ghinwa Dumyati from the University of Rochester Medical Center.

Core Element 2: Accountability

Accountability for antibiotic stewardship means empowering leaders to set standards, communicate expectations, and support oversight. A facility should identify people who are responsible for both the overall stewardship effort and the day-to-day implementation, consistent with the structure of that particular facility. Whenever possible, facilities should integrate antibiotic stewardship strategies into existing workflows and organizational structures to minimize burden and to show how stewardship fits into larger resident safety and care quality improvement efforts. Post-acute and long-term care facilities differ with respect to size and workforce, making it difficult to define a universal structure for the antibiotic stewardship team. Planning discussions should address who might best fulfill the needed function, recognizing that expertise, training, workload, and interest may influence such decisions. Facilities should focus on cross-training for staff development and co-leadership to sustain direction, consistency, and accountability for antibiotic stewardship practices and outcomes.

Implementation Strategies

LOWER INTENSITY

- Share a letter of commitment with prescribers, referring hospitals, and outpatient clinics in the community.
- Conduct an assessment that includes review of team skills, capacity, and expertise to define functions and facility needs.[27]
- Meet with consultant pharmacists and infection preventionists to define roles and responsibilities required by the CMS conditions of participation. Ensure these individuals are antibiotic stewardship team members and communicate regularly with each other.
- Designate roles and responsibilities for stewardship within the facility and include defined roles and responsibilities as part of documented facility antibiotic stewardship policy.

HIGHER INTENSITY

- Establish authority and expectation for the medical director to review and communicate changes to prescribing clinicians in compliance with the antibiotic use requirements of the facility.
- Include a resident/family council representative on the antibiotic stewardship team.
- Establish antibiotic stewardship as a standing agenda item during monthly quality improvement meetings and focus first on retrospective review of data, progressing over time to review with real-time (prospective) data.
- Establish standalone antibiotic stewardship team meeting that meets at least on a quarterly basis.
- Incorporate antibiotic stewardship into existing daily facility team meetings, such as the team huddle or shift change to address antibiotic use.
- Seek public health department designation on an “honor roll” for facilities meeting established antibiotic stewardship goals.
- Engage with local hospital “C-suite” to seek hospital “preferred referral” status for meeting antibiotic stewardship goals and standards of implementation.

Potential Barriers and Suggested Solutions

Facility is unable to find a qualified leader or staff member to lead antibiotic stewardship efforts.

Suggested Solutions

- Support staff members and leaders with appropriate education and training opportunities.
- Approach the health department, laboratories, or community/regional referring hospitals for training support.
- Join regional collaborative and professional organizations that will support antibiotic stewardship efforts.
- Add antibiotic stewardship skill sets to job descriptions to recruit leadership.[28]

Staff turnover makes it difficult to sustain accountability for ongoing antibiotic stewardship initiatives.

Suggested Solutions

- Establish co-leaders of the stewardship program, and cross-train "champions."
- Add antibiotic stewardship roles and functions to job descriptions and position announcements.
- Identify training and expertise in antibiotic stewardship as areas for professional advancement for staff.
- Share and celebrate small advances in antibiotic use and outcomes to develop a sense of team accomplishment and investment in antibiotic stewardship.

Staff members do not identify antibiotic stewardship as their responsibility.

Suggested Solutions

- Articulate the facility's commitment to improving antibiotic use as a resident safety and health improvement issue.
- Ensure that infection preventionists, consultant pharmacists, and others participate in training that connects their roles with improved antibiotic use.
- Share information about improvement efforts to demonstrate "small wins" and gain team energy.
- Use resident stories and case examples to show the importance of team-based efforts and the opportunities for all to contribute.
- Establish a committee specific to antibiotic stewardship and assign specific staff to that committee.

Leaders hesitate to communicate with prescribers about inappropriate antibiotic utilization.

Suggested Solutions

- Provide training and feedback to leaders and direct care staff on communication strategies and facility protocols on antibiotic prescribing.
- Ensure that facility leadership supports the antibiotic stewardship team in addressing inappropriate prescribing practice.
- Benchmark individual prescribers to overall facility activity on antibiotic use to show where outliers may exist regarding choice of agent, rate of antibiotic starts, or duration of therapy.

Suggested Tools and Resources

Sample Stewardship Team Materials

- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Suggested Agenda for an Antimicrobial Stewardship Program Team Meeting.
- Colorado Department of Public Health and Environment. Antimicrobial Stewardship Assessment Tool for Long-Term Care Facilities: Sample Letter.

Toolkits and Guides

- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Start an Antimicrobial Stewardship Program.
- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Roles and Responsibilities for Antimicrobial Stewardship.
- National Nursing Home Quality Care. Collaborative Change Package.
- Greater New York Hospital Association United Hospital Fund. Antimicrobial Stewardship Toolkit.

Sample Facility Assessments and Gap Analysis Tools

- Minnesota Department of Health. Antimicrobial Stewardship Gap Analysis Tool.
- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Readiness Assessment.
- Nebraska Antimicrobial Stewardship Assessment and Promotion Program (ASAP). Extended assessment instrument for long-term care facilities.

Sample Checklists

- CDC. The Core Elements of Antibiotic Stewardship in Nursing Homes Checklist.
- Qualis Health. Checklist on Core Elements of Antibiotic Stewardship in Nursing Homes

Honor Roll Applications

- Washington State Department of Health. EQuIP for Long-Term Care Facilities Participation Agreement.
- Minnesota Department of Health. Antibiotic Stewardship Honor Rolls

CASE STUDY

Accountability Begins with Clearly Defined Roles on the Antibiotic Stewardship Team[c]

The Highlands at Brighton, a 145-bed facility, with two traditional long-term care (LTC) units, including a memory care unit and two specialty units, has successfully reduced antibiotic use in its facilities by more than 25 percent through its antibiotic stewardship program (ASP). Having a team with clear roles and responsibilities lead the ASP is key to Highlands' success.

Medical Director

- Attends Pharmacy and Therapeutics Committee and Quality Committee meetings—antimicrobial use is discussed at each.
- Reviews prescribing and dispensing data and stewardship strategies with medical staff.
- Stresses the appropriateness of non-pharmacologic management of patients who don't meet prescribing criteria.

Nurse Manager*

- Leads infection prevention efforts by tracking every resident placed on antibiotics and documenting residents' diagnosis and demographic information.
- Maintains a comprehensive dataset on antibiotic use and reconciles facility data with pharmacy prescribing data monthly.
- Attends training and certificate programs on Antibiotic Stewardship and makes local and regional presentations on the program.
- Reviews cases with providers when residents don't meet criteria for antibiotics.

***Note: The nurse manager role could also be conducted by the designated infection preventionist or director of nursing.**

Provider Champion

- Serves as a lead informant on trends, such as identifying residents being placed on antibiotics with high frequency
- Trained and empowered to conduct a 48-hour follow-up for all residents after an antibiotic is prescribed to reassess the resident's condition. Based on the findings of this follow-up, the antibiotic is changed (e.g., course shortened), discontinued, or adjusted in approximately 20 to 25 percent of residents.

c Based on an interview on March 12, 2018 with Dr. Joseph Nicholas, medical director at The Highlands at Brighton facility, and Dr. Ghinwa Dumyati from the University of Rochester Medical Center.

Core Element 3: Drug Expertise

Access to expertise regarding optimal antibiotic use is critical to successful antibiotic stewardship. Facilities that have secured regular consultations with an infectious disease expert, both in person and remotely, have experienced 30 to 50 percent reductions in antibiotic use, rates of *C. difficile*, and use of fluoroquinolones.[29] However, post-acute and long-term care facilities often have limited on-site access to infectious disease physicians or other clinical experts. Facilities must therefore pursue creative approaches that leverage existing resources and partnerships to garner expertise in antibiotic stewardship, or invest in other areas to secure expertise. Consultant pharmacists are an especially important source of drug expertise and leadership and can offer training in antibiotic stewardship and remote consultation. Strategies should emphasize both identifying and training expertise within the facility as well as creating community partnerships for remote expert consultation.

Implementation Strategies

LOWER INTENSITY

- Use facility assessment to determine drug expertise needs.
- Provide ready-made quick guides on antibiotic use at a centralized location (e.g., nursing station) for reference.
- Encourage consultant pharmacist to seek antibiotic stewardship training or certification, or require a consulting pharmacy group to partner with an infectious diseases/antibiotic stewardship expert for support of facility initiatives.
- Require consultant pharmacist, if trained in antibiotic stewardship, to provide monthly retrospective reviews of medications and offers consultations to prescribing clinicians and direct care staff.
- Conduct outreach to existing networks—hospitals, local clinics, public health agencies or regional QIN-QIOs—to identify free or low-cost infectious disease and antibiotic expertise.
- Enlist the medical director to provide drug expertise and review of antibiotic use.

HIGHER INTENSITY

- Include drug expertise skills in facility job descriptions; seek infectious disease pharmacy or clinical expertise in medical director and pharmacy positions.
- Provide staff training for drug expertise through online or in-person certificate programs.
- Evaluate options for facility use of off-site infectious diseases expert support for antibiotic stewardship team (e.g., tele-stewardship program).
- Establish a partnership with an external entity to provide weekly in-person consultation, and remote consultations as needed.[30]
- Develop relationships with data experts through state collaboratives, health departments, trade associations, or specialty societies to analyze data and inform tracking methods.

Potential Barriers and Suggested Solutions

Facility does not have an on-site expert in infectious disease or antibiotic stewardship.

Suggested Solutions

- Identify staff development opportunities for training (e.g., SHEA/SIDP/ASCP, CDC, local collaboratives, state or county departments of public health), particularly for consultant pharmacists or medical directors.
- Review contract with consultant pharmacists and/or pharmacy providers to determine if they are able to review antibiotic data and help champion stewardship.
- Encourage consultant pharmacists and/or their group/company to partner with infectious diseases experts for guidance on antibiotic stewardship.
- Reach out to the department of public health for education, training, or consultation.
- Partner with the department of public health, local hospital, or medical center with antibiotic stewardship expertise for data review and consultation.

Facility does not have funding or resources to invest in an infectious disease professional.

Suggested Solutions

- Approach local or state public health department or QIN-QIO to access needed expertise.
- Consider joining or developing a regional collaborative to leverage expertise across multiple facilities.
- Reach out to referring hospitals to identify and create a memorandum of understanding to obtain expert consultation.
- Point to research studies demonstrating the efficacy of this investment to facility decision makers.[33]

Consultant pharmacist or long-term care facility pharmacy provider is not adequately reimbursed for additional antibiotic stewardship requirements or contract does not include antibiotic stewardship activities.

Suggested Solutions

- Renegotiate contract to include reimbursement for consultant pharmacist, LTC pharmacy services, or advanced programs related to antibiotic stewardship within the facility.
- Consider tele-stewardship or consulting agreement with infectious disease expert to provide support to facility stewardship team and to the consultant pharmacist.[31,32]
- Ask the local or state department of health to provide training on data review to the medical director, the director of nursing, and key antibiotic stewardship team leaders.

Suggested Tools and Resources

Standards and Guidelines

- SHEA. Policy Statement Antimicrobial Stewardship.
- Bentley D, Bradley S, High K, et al. Practice guideline for evaluation of fever and infection in long-term care facilities. *J AM Geriatr Soc.* 2001;49(2):210-222.
- McDonald LC, Gerding DN, Johnson S, et al. Clinical practice guidelines for Clostridium difficile infection in adults and children: 2017 update by IDSA and SHEA. *Clin Infect Dis.* 2018; 7(19):e1-e48.

Certificate Programs

- SIDP/ASCP Long-Term Care Antimicrobial Stewardship Certificate Program.

Research and Evidence-Base

- Banks R, Viau R, Wilson B, et al. At a rural Veterans Affairs medical center, telehealth decreased antibiotic use in long-term, but not acute care. *Open Forum Infect Dis.* 2017;4(S1):S275.
- Doyle, K. Infectious Disease Patients May Benefit from Telemedicine. *Managed Healthcare Connect.* January 1, 2015.
- Perla RJ, Provost LP, Murray SK. The run chart: a simple analytical tool for learning from variation in healthcare processes. *BMJ Qual Saf.* 2011;20(1):46-51.

Toolkits and Quick Guides

- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Suspected UTI SBAR Toolkit.
- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Working With Your Lab to Improve Antibiotic Prescribing.
- AHRQ. 12 Common Nursing Home Situations and Infection Control Guidelines for MRSA, *C. Difficile,* and VRE Pocket Cards.
- University Health System. Pocket Guide for Antibiotic Pharmacotherapy by Class.
- Minnesota Hospital Association. Act Fast: Early Detection of Sepsis Quick Guide.
- Nebraska Antimicrobial Stewardship Assessment and Promotion Program. Revised McGeer Criteria for Infection Surveillance Checklist.
- ASCP. Antimicrobial Stewardship in LTPAC.

CASE STUDY

The Role of Consultant Pharmacists in Antibiotic Stewardship Programs[d]

Dr. Deborah Milito, director of clinical and consultant services for long-term care for Diamond Pharmacy Services, leads an Antibiotic Stewardship Program (ASP) for a long-term care facility and provides training for other consultant pharmacists throughout Pennsylvania and parts of Ohio. She ensures that each of the 40+ facilities under her purview has access to consultant pharmacists with up-to-date training in antibiotic stewardship. At the facility where she serves as the antibiotic stewardship team champion, she and her antibiotic stewardship team have identified two key strategies for improvement:

Ensure that all antibiotics have a ***diagnosis*** and a ***cut date***.

To support her facility's work towards ensuring that all antibiotic prescriptions have a diagnosis and cut date, the consultant pharmacist engages in several activities including:

- Shares new treatment guidelines, strategies, and research in monthly communications with the antibiotic stewardship team.
- Offers in-service training for all staff, as requested.
- Prepares a monthly antibiotic report that includes a list of residents on antibiotics, their diagnosis, and their drug dose and duration and uses this list to support discussion on specific issues, such as antibiotics prescribed without an indication or without a stop date.
- Reviews resident charts for antibiotic orders at monthly team meetings and highlights issues related to proper dosing. These discussions are opportunities for learning, dialogue, and collaboration on how teams can provide the highest quality of care for residents.
- Invites the hospital pharmacist to attend the antibiotic stewardship committee meeting and uses this connection to identify opportunities for enhanced collaboration with the hospital.
  - Example: The CP requested that the hospital pharmacist work with hospital staff to include a stop date in records for residents transferring into their facility.
- Provides feedback to prescribers. The recommendations are better received when phrased as, "For future reference…" or "To enhance the antibiotic stewardship at the facility…"
  - Example: Upon discovering that a prescriber used metronidazole for *C. difficile*, she wrote, "For future reference, we have reviewed the 2017 *C. difficile* guidelines, and they now recommend that we use vancomycin instead of metronidazole as a first line treatment for *C. difficile.*" Following this conversation, the prescriber has started using recommended medications for *C. difficile.*

> One of the most essential elements of antibiotic stewardship is for EVERYONE, from the certified nursing assistants to the facility administrator, to be on the same page." – DR. DEBORAH MILITO, DIRECTOR OF CLINICAL AND CONSULTANT SERVICES FOR LONG-TERM CARE, DIAMOND PHARMACY

d Based on an interview on March 19, 2018 with Dr. Deborah Milito, director of clinical and consultant services for long-term care for Diamond Pharmacy and chief antibiotic steward officer.

Core Element 4: Action

Individual and team-based action is critical to improving antibiotic use in post-acute and long-term care facilities. The CMS conditions of participation for long-term care facilities require facilities to demonstrate planning and specific action to reduce unnecessary antibiotic use, including the development of protocols and a system to monitor antibiotic use. Action steps outlined in this section can not only help the facility with continual quality improvement and prepare for external surveys, but can also identify and help prioritize policy and process changes. A crucial part of the assessment and planning process is identifying *who*[35] will be responsible for each action, which may vary by facility. By focusing first on small, achievable actions for improvement, facilities can progress towards more advanced quality initiatives.

Common Nursing Home Situations in Which Systemic Antibiotics are Generally Not Indicated[34]

- Nonspecific symptoms, such as falls or change in mental status.
- Positive urine culture in an asymptomatic resident.
- Urine culture ordered only because of change in urine appearance.
- Common cold, bronchitis, or asthma in a resident who does not have COPD.
- Suspected or proven influenza in the absence of a secondary infection (but DO treat influenza with antivirals).
- Skin wound without cellulitis, sepsis, or osteomyelitis (regardless of culture result).
- Acute vomiting and/or diarrhea in the absence of a positive culture for shigella or salmonella, or a positive toxin assay for C. difficile.

Implementation Strategies

LOWER INTENSITY

- Antibiotic stewardship team conducts a full facility assessment to map current processes including recognition of resident change in condition, criteria for testing and diagnosis, antibiotic prescribing, and review.
- Team uses assessment to identify and prioritize action around gaps in facility treatment protocols, data collection, documentation processes, and evaluation and testing practices.[36]
- Antibiotic stewardship champions document facility protocols[37] and checklists for antibiotic prescribing, including evaluation of clinical signs and use of diagnostic testing using standardized tools and criteria; consider adaptation of the Loeb Minimum Criteria or the clinical components of the revised McGeer Criteria.[38,39,40]
- Facility leadership requires indication and stop date on all antibiotic orders.
- Consultant pharmacist or antibiotic stewardship team makes quick guides to antibiotic use available at a central location (e.g., nursing station).
- Antibiotic stewardship champions educate prescribers and facility care providers on common clinical situations for which antibiotics should generally not be prescribed.[41]
- Drug expert adapts treatment guidelines (e.g., for UTI, SSTI) to develop facility agent selection and dose optimization recommendations in consultation with infectious disease expert, with focus on high-priority classes of drugs or prolonged duration.

- Medical director and consultant pharmacist develop a facility policy to address prophylactic antibiotics.
- Nurse leaders and infection preventionists document daily antibiotic events, using existing format (e.g., shift change report) and include dose, duration, days of therapy, and indication.
- Consultant pharmacist and infection preventionist conduct coordinated medication regimen review (MRR) on all antibiotic orders, including those started or discontinued.
- Consultant pharmacist or drug expert ensures medication safety through retrospective review.
- Staff ensures that discussions of resident care include information on antibiotics.
- Consultant pharmacist reviews facility drug emergency "kit" and consults with dispensing pharmacy about available antibiotics included in the onsite kit, to ensure access to preferred agents.[42]

HIGH INTENSITY

- Consultant pharmacist conducts a medication use evaluation (MUE) of antibiotics used in the facility focusing on high-cost or high-use agents, particular indications, or agents targeted for reduced utilization (e.g., fluoroquinolones).[43] Consultant pharmacist can request use report from dispensing pharmacy.
- Antibiotic stewardship team defines facility care pathways or workflows that target improved use of antibiotics, beginning with one clinical situation and addressing each area systematically.[44]
- Antibiotic stewardship team convenes daily (e.g., during morning report or shift change) to identify antibiotic use issues in real time; encourage staff to identify questions or potentially inappropriate use for discussion and mitigation.
- Team members use structured communication strategies (e.g., SBAR) to implement antibiotic stewardship protocols; include documentation in resident care records.
- Consultant pharmacist or medical director establishes a standard process for an ASP team to review antibiotics prescribed after 48-72 hours ("antibiotic timeout" or "post-prescription review").[45]
- Medical director and consultant pharmacist establish a prior authorization process for a certain class of antibiotics (e.g., fluoroquinolones), or for specific indications.[46]
- Administrator and medical director empower facility not to accept transfer of residents into the facility without antibiotic name, dose, indication, days of therapy, or follow-up plan.
- Team leader identifies facility action steps to assess and address residents on antibiotics started in other settings.
- Facility leaders communicate with local emergency department directors about antibiotic use and collaborate on education about appropriate prescribing and facility policies.[47]
- Team leader conducts prospective review and feedback interventions—led by an infectious disease pharmacist or physician—with weekly chart-reviews, case discussions with off-site physicians, and communication with prescribers.
- Consultant pharmacist and/or medical director obtain and evaluate antibiograms from facility's affiliated microbiology labs, and use in prescriber education and prioritization of interventions.
- Consultant pharmacist, medical director and/or consulting infectious disease physician create treatment guidelines based on institution-specific culture data (e.g., antibiogram data).

Potential Barriers and Suggested Solutions

Facility staff overwhelmed by quality improvement initiatives and requirements.

Suggested Solutions

- Review medication management and infection prevention practices currently in place.
- Narrow antibiotic stewardship efforts to one to three areas that address clear problem areas.
- Ask consultant pharmacist, lab, or infectious disease expert for assistance in facility assessment to identify first action steps.
- Cross-train staff members so more than one person can assist in antibiotic stewardship.

Facility team has interest in antibiotic stewardship, but has difficulty identifying where to start.

Suggested Solutions

- Focus on improving assessment and testing approaches in the facility first.[48,e]
- Establish a committee to complete a facility assessment to identify common clinical situations and baseline antibiotic use (e.g., agent type, new starts, patient days).
- Use consultant pharmacist's MUE to identify outliers (e.g., infections with high incidence, days of therapy not aligned to treatment guidelines) and focus on actions that can address those issues.

Care providers and/or prescribers encourage antibiotic use out of concern for meeting resident and family needs and expectations.

Suggested Solutions

- Discuss and co-create facility policy on clinical evaluation and antibiotic prescribing in collaboration with the resident and family council.
- Educate residents and families at the time of admission on appropriate antibiotic use, including when not to prescribe antibiotics.
- Establish clear protocols and communicate with families and residents for "active monitoring" of residents who are not prescribed antibiotics; establish a clear action for bedside providers on how to respond (e.g., refer to nurse manager, scripts, etc.).
- Share information facility-wide on antibiotic use and targets for intervention; provide updates on progress toward the stated goal.
- Conduct role play training on communication with residents and families about antibiotics.

Prescribers are not aware of or do not refer to guidelines when prescribing antibiotics.

Suggested Solutions

- Use formal education programs to train prescribers on guidelines and communication of clinical situations when antibiotics are—or may not be—indicated.
- Share guidelines and recommendations on appropriate antibiotic use and ensure they are easily accessible to providers.
- Identify consultants (e.g., psychiatry, dental) who recommend diagnostic tests and antibiotic treatments that conflict with current guidelines; use champions or experts to engage in one-on-one conversations.
- Provide prospective review and feedback with accompanying reference to guidelines.
- Share facility-wide antibiotic use data and prescriber-specific data for peer comparison at provider meetings, in written communication, and in individual consultations.
- Use posters and other "swag" to "market" the stewardship program and achieve high visibility.

e As a specific example, implement a standard order with the lab serving the facility for a "urinalysis with reflex to urine culture and sensitivity, if indicated" rather than the standard order for "urine culture and sensitivity." The laboratory would, in effect, only process urine cultures if criteria were met for abnormal urinalysis, thereby decreasing the number of urine cultures performed while avoiding delay at the facility.

Prescribers do not respond to education, recommendations, or expert feedback from antibiotic stewardship program, or resist changes in practice.

Suggested Solutions

- Train and give regular coaching and feedback to direct care staff about communicating with prescribers on infection diagnosis and antibiotic prescribing.
- Involve prescribers and direct care staff in setting goals and objectives for antibiotic stewardship, and make stewardship a support service rather than a restrictive process.
- Reference specific national guidelines or facility guidelines to support recommendations.
- Recommend and provide supporting data for alternative treatment approaches, rather than communicating punitive actions.
- Modify EHR to flag inappropriate use; consider eliminating prior authorization for prescriptions initially, and then move to "hard stops."[49]

Suggested Tools and Resources

Sample Facility Assessment Tools

- Nebraska Antimicrobial Stewardship Assessment and Promotion Program. Antimicrobial Stewardship Self-Assessment Instrument for Long-Term Care Facilities.
- National Nursing Home Quality Improvement Campaign. Assessment of Current CDI Prevention Activities Antibiotic Stewardship.
- Minnesota Department of Health Antimicrobial Stewardship Program Toolkit for Long-Term Care Facilities: Antimicrobial Use Assessment for Long-Term Care Facilities.

Resident Assessment Tools

- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Minimum Criteria for Antibiotics Tool.
- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Suspected UTI SBAR Toolkit.
- Minnesota Department of Health. Antimicrobial Stewardship Program Toolkit for Long-Term Care Facilities: Nursing Process Evaluation Tool Resident Change in Condition.
- National Nursing Home Quality Improvement Campaign. CMS Critical Elements Pathways.
- AHRQ. Nursing Home Antimicrobial Stewardship Guide. SBAR Templates:
  - Suspected Urinary Tract Infection.
  - Suspected Lower Respiratory Infection.
  - Suspected Skin and Soft Tissue Infection.
- Massachusetts Coalition for the Prevention of Medical Errors. ABCs for Diagnosing Urinary Tract Infection in Long Term Care.

Sample Communication Tools

- AHRQ Nursing Home Antimicrobial Stewardship Guide. Medical Care Referral Form.
- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Letter to Prescribing Clinicians on the Protocol for Three Common Infections.
- CDC. Sample Inter-facility Infection Control Transfer Form:
  - Example 1
  - Example 2
- Colorado Department of Public Health and Environment. Antimicrobial Stewardship Assessment Tool for Long-Term Care Facilities: Sample Letter
- University of Nebraska Medical Center. General Shift Change Report.
- Fisch J, McNamara S., Lansing B et al. The 24-hour report as an effective monitoring and communication tool in infection prevention and control in nursing homes. *Am J Infect Control*. 2014;42(10):1112-1114.

Tools on When Not to Treat

- AHRQ. Nursing Home Antimicrobial Guide. 12 Common Nursing Home Situations and Infection Control Guidelines for MRSA, C. Difficile, and VRE Pocket Cards.
- Massachusetts Infection Prevention Partnership. Treating Asymptomatic Bacteriuria: All Harm, No Benefit.

Toolkits and Guides

- Nebraska Antimicrobial Stewardship Assessment and Promotion Program: Tools and Templates for Long-Term Care.
- National Nursing Home Quality Improvement Campaign Toolkit.
- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Readiness Assessment.
- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Working With Your Lab to Improve Antibiotic Prescribing.
- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Monitor and Sustain Stewardship Toolkit.
- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Minimum Criteria for Common Infections Toolkit.
- Michigan Antibiotic Resistance Reduction Coalition. Long-term Care Toolkit.
- Minnesota Department of Health. Antimicrobial Use Assessment.
- Washington State Department of Health. JumpStart Stewardship: Implementing Antimicrobial Stewardship in Nursing Homes.
- Minnesota Department of Health. Minnesota Antimicrobial Stewardship Program Toolkit for Long-Term Care Facilities.
- Stone ND, Ashraf MS, Calder J, et al. Surveillance definitions of infections in long-term care facilities: revisiting the McGeer criteria. *Infect Control Hosp Epidemiol.* 2012;3(10): 965-977.

Antibiotic Time-Out Procedure[50]

- Pharmacy (or EHR) produces a daily list of residents who have taken antibiotics for more than 48 hours and distributes to the director of nursing and nurse managers.
- Designee (e.g., charge nurse, nurse manager, infection preventionist, director of nursing) identifies which residents on the 48-hour list have not had Antibiotic Time-Out SBAR completed for their current round of antibiotics.
- Designee completes an Antibiotic Time-Out SBAR form, sends to the prescribing clinician, and adds a copy of the SBAR in the resident's clinical record.

Note: This process could be integrated into an EHR, if possible.

A Note About Criteria to Guide Antibiotic Use

Unnecessary testing and incomplete or inaccurate diagnosis are common issues in inappropriate antibiotic use. It is therefore vital to establish facility-specific criteria that define the person-centered assessment of a resident and the clinical basis for notifying a clinician about a resident's change in condition and the potential need for an antibiotic prescription.

Commonly referenced criteria that specifically address long-term care settings include the clinical components of the revised McGeer criteria, which outline surveillance definitions for common infections within a population and the Loeb criteria, which focus on clinical diagnosis and define the minimum set of symptoms that indicate a person needs treatment for an infection.[51,52] Experts agree that antibiotics should not be prescribed unless the resident meets clinical criteria for an infection.[53] Facilities can look to tools developed by AHRQ and INTERACT® as a useful starting point for implementing specific protocols.

CASE STUDY

Addressing Communication in Transitions of Care[f]

The Minnesota Department of Health (MDH) operates a statewide One Health Antibiotic Stewardship Collaborative, with representatives from state agencies, public health, medicine, animal health, and environmental health. In addition, to support healthcare stewardship in Greater Minnesota, MDH has fostered development of the Local Collaborative for Antibiotic Stewardship in rural Detroit Lakes, MN. Local collaborative members identified improvement of stewardship over healthcare transitions as a top priority. Inadequate or non-standard communication practices between facilities can contribute to unnecessary or inappropriate antibiotic use, including lack of antibiotic indication or duration.

The Collaborative formed a Care Transitions Workgroup that included local representatives from pharmacy, infection prevention, and nursing. The Workgroup reviewed several communication tools, including the CDC's Infection Control Transfer Form. Workgroup members adapted the CDC form to include additional data elements. The Detroit Lakes paper-based transfer form captures resident isolation status, cultures taken or pending, resident symptoms and risk factors, presence of resistant organisms (e.g., MRSA, VRE), and the antibiotic order, including start date, dose, and duration. As part of the admissions process, the receiving facility (e.g., skilled nursing facility) will complete the standardized form with information obtained from the transferring facility (e.g., acute care hospital). Data are then recorded in the resident's medical record. In addition to improving the quality of routine transitions, use of the form contributes to fulfillment of CMS conditions of participation. Essentia Health-Oak Crossing, a 96-bed skilled nursing facility and member of the Detroit Lakes Local Antibiotic Stewardship Collaborative, will pilot the new transition form.

f Based on interview conducted on March 21, 2018 with Pam Gahr (antibiotic stewardship coordinator) and Amanda Beaudoin with the Minnesota Department of Health, and Stacie Urbanick (director of nursing) with Essentia Health-Oak Crossing.

Core Element 5: Tracking

Effective tracking refers to the systematic collection of antibiotic use data that enables facilities to assess, monitor, and improve prescribing practices. Important data elements for antibiotic use tracking include: resident name, antibiotic name and class, indication, days of therapy, route, and total resident days. Facilities vary significantly in their technological capacity to collect and track these data. Data sources may include EHRs with e-prescribing, long-term care pharmacy data, and/or paper-based medical charts from which data must be abstracted manually. From these data, the most commonly used measures for tracking antibiotic use are antibiotic starts and days of therapy. In accordance with CMS conditions of participation for long-term care facilities, tracking efforts should ensure that all antibiotic prescriptions include an indication and one process measure (e.g., changes in antibiotic starts, days of therapy (DOT) per 1,000 resident days) and one outcome measure (e.g., changes in UTI diagnosis, *C. difficile*, and rehospitalization).

Implementation Strategies

LOWER INTENSITY

- Assess current data collection processes and identify data collection strategies with a core team that includes pharmacists, infection preventionists (IP), directors of nursing (DON), and nurse manager.
- Identify lead individual (e.g., DON, NP, IP) to be in charge of tracking and ensure this person has access to medical records.
- Train relevant staff on using data review/analysis tools.
- Use data to identify key priority problems in the facility.
- Identify the sources of data for the facility. Options may include: dispensing pharmacy, medical records, or prescription orders.
- Define the data points to be collected. Choose one improvement factor as a starting point and track those data points.
- Share data with antibiotic stewardship or quality improvement team for review.

HIGH INTENSITY

- Review antibiotic prescriptions by resident for the prior 6-12 months; identify agents used, mismatch to guidelines, dose, or duration, or recurrent use to identify problem areas in the facility.
- Establish standard data collection process in terms of information, recording practices (e.g., Excel or EMR), and timing/frequency.
- Expand the shift change report to help track the number of residents on antibiotics, days of therapy, indication, and cultures ordered.
- Collect indication, drug, dose, duration and route of administration for all antibiotics used in the facility.
- Develop a mechanism for bi-directional inter-facility communication about current antibiotics and MDRO status for transferring residents
- Collaborate with referring entities to revise transfer forms and establish procedures and points of contact.

- Track the number of antibiotic prescriptions adherent to facility guidelines.
- Calculate or ask dispensing pharmacy to provide: antibiotic starts or days of therapy (DOT) per resident days overall, by antibiotic/class, by indication, or by provider monthly or quarterly depending on objectives.

Potential Barriers and Suggested Solutions

Facility lacks technological infrastructure to track data.

Suggested Solutions

- Determine if consultant pharmacist can provide antibiotic use reports.
- Conduct a facility assessment to identify how data are currently tracked in other areas; review existing medication review, resident assessment, shift change, or infection logs to see if these processes can be adapted to include antibiotic data.
- Identify one priority area to start tracking (e.g., antibiotic starts/discontinuations per day).
- Use existing spreadsheet templates (See "Suggested Tools and Resources" below).
- Contact public health department, QIN-QIO, or local referring hospitals for sample forms or tools.

Electronic health record used by facility does not include fields for antibiotic use tracking

Suggested Solutions

- Require that all prescription orders have an indication, dose, and duration to support tracking of those elements.
- Use existing spreadsheet templates or prescription forms instead of an EHR until the facility can identify the most relevant, highest impact data points.
- Communicate with EHR vendor to include specific fields within the EHR or allow the facility to use "User Defined Assessment" area in its stewardship efforts.
- Use "event reports" to create a place for tracking antibiotic timeouts.
- Create nonelectronic methods until the facility can identify the most relevant, highest impact data points; then discuss incorporation into the EHR.

Facility has insufficient expertise or staff capacity to track antibiotic data consistently

Suggested Solutions

- Define responsibility for this function within existing job descriptions.
- Establish data collection and tracking as a shared role, emphasizing the partnership between the consultant pharmacist and the infection preventionist, for example.
- Prioritize the tracking of simple metrics that are based on the facility's quality improvement objectives.
- Provide training in data collection and communicate training as a professional development opportunity for staff.
- Require the medical director to oversee tracking or use contract disease expertise to do so.

Suggested Tools and Resources

Tracking Basics

- Measure Your Success: Monitoring and Tracking Data. New England Quality Innovation Network.
- Antibiotic Stewardship Measurement Framework. Centers for Disease Control and Prevention.

Tracking Tools

- AHRQ Toolkit 2: Monitor and Sustain Stewardship. Antibiotic Use Tracking Sheet, Monthly or Quarterly Prescribing Profile.
- Infections Tracking Tool from the National Nursing Home Quality Improvement Campaign.
- Rochester Nursing Home Collaborative: Antibiotic Tracking Tools and Instruction Sheet.
- The Nebraska Antimicrobial Stewardship Assessment and Promotion Program (ASAP). Antibiotic Stewardship in Nursing Homes: Tools and Templates.
- Qualis Health Infections Tracking Tool.
- Massachusetts Coalition for the Prevention of Medical Errors. Sample Data Collection Workbook: Long Term Care Run Charts.

Antibiograms Tools and Resources

- AHRQ. Methodological Challenges Associated With Developing and Implementing Antibiograms in Nursing Homes.
- AHRQ Toolkit 1. Working With a Lab to Improve Antibiotic Prescribing.
- AHRQ. Toolkit 2. Using Nursing Home Antibiograms to Choose the Right Antibiotic.
- Nebraska Antimicrobial Stewardship Assessment and Promotion Program: Antibiogram Template.
- Minnesota Department of Health Antibiogram Fact Sheet

Antibiograms

An antibiogram is a report that aggregates data about diagnostic clinical specimens sent for laboratory testing during a specific time period, along with the susceptibility of each organism to various antibiotics. A facility-specific antibiogram can effectively focus attention on an issue of resistance, inform facility-focused treatment guidelines, and prioritize antibiotic stewardship actions.[54] One challenge occurs in generating such a report for facilities that may have few isolates, which are pure microbial or viral samples obtained from infected individuals. Facilities may consider the following hierarchy helpful in identifying the best option to utilize available data and meet their facility's information needs:

- Request facility-specific antibiogram from the laboratory[55]
- If current facility-specific antibiogram cannot be obtained due to <30 isolates, request antibiogram for last 2 years.
- If laboratory is unable to provide an antibiogram, use existing guidance (e.g., AHRQ Nursing Home Antibiogram Toolkit) or work with local infectious disease experts to create antibiogram manually for the facility using culture reports from the last 1-2 years.
- Ask lab or state health department to provide regional nursing home antibiogram, especially if general prescribing practices are similar in the region.
- Obtain culture reports on frequently seen pathogens in the facility in the last 2 years. Study the susceptibility pattern to define guidance on UTI, for example.

Facilities not able to obtain an antibiogram or culture data should develop facility-specific treatment guidelines based on clinical guidelines and best practice outlined by expert professional organizations (e.g., IDSA, SHEA, SIDP).

CASE STUDY

Begin Tracking in Your Facility: Find a Strategy That Works[g]

When the Minnesota Department of Health developed a robust spreadsheet to track data on infections and antibiotic use in long term care facilities, the director of nursing (DON) at Essentia Health-Oak Crossing decided to incorporate the new tool into the facility's antibiotic use tracking processes. The DON worked with the infection preventionist (IP) for Essentia Health Hospital to develop a process for populating the spreadsheet daily. They explored how to align the spreadsheet with the facility's electronic health record (EHR) to capture and track data using the event template, which is where a resident's change in health status is documented. Essentia Health staff worked with their EHR vendor to build structured fields in the event template to capture the appropriate data and automatically populate the tracking spreadsheet. The tracking data is used during daily leader huddles. When a resident is prescribed an antibiotic, nursing staff review symptoms and criteria in real time. In cases where the tracked data suggest that criteria are not met for antibiotic use, the nursing staff respectfully contact the provider and review the course of treatment. The team has been able to discontinue antibiotics for a number of patients and shorten the course for others.

"We believe tracking antibiotic use is the right thing to do. Why do we have our residents on antibiotics if it's not absolutely necessary? Why do we keep our residents on longer durations of antibiotics if it's not a necessity? We are the resident's voice, and we believe that by not addressing both areas of antibiotic use truly is a disservice to those we serve"— ESSENTIA DIRECTOR OF NURSING

g Based on interview conducted on March 21, 2018 with Pam Gahr (antibiotic stewardship coordinator) and Amanda Beaudoin with the Minnesota Department of Public Health, and Stacie Urbanick (director of nursing) with Essentia Health-Oak Crossing.

Core Element 6: Reporting Information on Improving Antibiotic Use

Translating antibiotic use data into a practical and usable format is essential. Success in doing so informs providers and facilities about areas to improve and shows regulatory agencies that a facility is complying with antibiotic related requirements. The CMS conditions of participation for long term care facilities require antibiotic stewardship programs to report antibiotic use data to CMS as least annually and to the facility's quality improvement committee on a regular basis. To enhance usability, reports should be short, focused on priority areas, include stewardship goals and progress made towards achieving goals, and incorporate visuals (e.g., charts, graphs, storyboards) that quickly communicate important information. Facilities should share reports across the organization as well as with external partners, consulting entities, and regulatory agencies. Reports can support education and training sessions and familiarize staff with findings. The reports can also be used to assess process and outcome measures and gauge progress made towards goals.

Implementation Strategies

LOWER INTENSITY

- Facility identifies who "owns" reporting efforts.
- Define specific timing and method of reporting antibiotic use data and outcomes.
- Incorporate automatically generated graphs from available spreadsheets or tools to provide visual progress reports.
- Provide monthly report at the stewardship team or quality improvement meetings on antibiotic use data and change in targeted metrics.
- If the facility has an internal webpage, provide antibiotic use data on a shared page and distribute to prescribers at regular intervals.
- Include antibiotic stewardship and use data in the facility newsletter, especially to highlight successful improvement strategies.
- Report progress towards goals and changes in measures to family/residents.
- Prepare an antibiotic stewardship report for CMS to review at least annually.

HIGH INTENSITY

- For facilities with EHRs, implement a real-time, facility-specific dashboard for ASP metrics available for all staff to view.
- Expand reports to include the next priority area for improving antibiotic use, with the goal to use reports to track antibiotic use on multiple priority areas.
- Provide monthly or quarterly prescriber-specific antibiotic use rates, peer comparison, and adherence to facility guidelines within individual reports for clinicians.
- Use reports in education and training for nurses, certified nursing assistants (CNAs), and prescribers.
- Cross-train multiple team members to review data and develop reports.
- Use reports as part of established and recurring review meetings with all prescribers; the medical director uses reports to engage in dialogue about treatment guidelines and alternatives with prescribing clinicians.

- Share reports on monthly to quarterly basis with administrative leadership and partnering organizations, including actionable items and goals
- Report to quality improvement committee and frontline staff on facility performance in relation to regional benchmarks when those data are available.
- Consider including clinicians' prescribing practices in reporting to create a clinician "honor roll."
- Report antibiogram data to prescribing clinicians to inform them of susceptibility patterns and recommendations for prescribing (e.g., agents to avoid).

Potential Barriers and Suggested Solutions

Facility lacks capacity to create new reporting mechanisms or to adapt data for multiple audiences.

Suggested Solutions

- Review existing resources to determine if the facility can adapt to include recommendations around antibiotic use.
- Reach out to local partners (e.g., QIN-QIOs, local public health agencies) requesting assistance to create new or adapt existing resources.
- Narrow the focus for reporting to a few priority data points and develop resources focused on those priority areas.

Facility culture of using reported data to guide practice is not well established.

Suggested Solutions

- Medical director and stewardship team leaders establish commitment to reporting data across all meetings including Resident and Family Council Meetings.
- Ask experts to consult on stewardship activities and request support or training related to data interpretation and reporting.
- Work with multidisciplinary team, including residents/families, to identify which data would be meaningful to report and share.
- Establish consistent frequency and reporting method.
- Add clear and concise explanations about what the data mean for each report.

Data reporting does not change prescriber practice over time.

Suggested Solutions

- Review how data are presented, and focus on whether information is both understandable and actionable.
- Medical director engages in ongoing discussion with prescribing clinicians about best practice, choice of therapy, evidence and individual data compared to facility-wide trends.
- Medical director can use benchmarking data, if available, or any significant event related to antibiotic use (e.g., increased number of cases of MDRO infections) to help change prescriber practice.
- Consult infectious disease expertise to better understand how to improve the prescribing process and to determine other factors that may be influencing prescribing behavior.
- Empower nurses to use reported data to communicate resident needs to prescribers and off-site physicians.
- Empower clinical staff to present data and make specific recommendations (e.g., change days of therapy or prescription) when communicating with prescribers.

Suggested Tools and Resources

Reporting Tools

- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Sample Quarterly or Monthly Prescribing Profile.
- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Sample Monthly Reports.
- Nebraska Antimicrobial Stewardship Assessment and Promotion Program. Quarterly Antibiotic Use Summary Report Template.
- Massachusetts Coalition for the Prevention of Medical Errors. Sample Data Collection Workbook: Long Term Care Run Charts.

Toolkits and Guides

- Qualis Health. Nursing Home Antibiotic Stewardship Checklist.
- Dumyati G & Felsen C. A Multidisciplinary Approach to Antibiotic Stewardship: Gathering and Using Data. Web Presentation.
- National Nursing Home Improvement Campaign. Storyboard Guide for Performance Improvement Projects.
- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Monitor & Sustain Stewardship.
- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Common Suspected Infections: Communication and Decision making for Four Infections.
- INTERACT® Version 4.0 Tools for Nursing Homes.
- CMS. QAPI Plan-Do-Study-Act Cycle Worksheet.

CASE STUDY

Antibiotic Stewardship Begins with Close Monitoring of Use[h]

Brookside Inn is a 120-bed skilled nursing facility offering post-acute and rehabilitation care in Castle Rock, Colorado. As part of its antibiotic stewardship program, Brookside implemented protocols based on the McGeer criteria for common infections, including UTI, SSTI, and PNA. As part of this work, the Director of Nursing developed an Antibiotic Notification and Provider Communication Tool to assist nurses in assessment and communication of potential resident infection. The McGeer criteria are embedded in the form to assist nurses in determining if the criteria for infection are met. The tool includes a script for communicating information for each criterion to providers and directs staff to report each antibiotic start to the infection preventionist (IP) prior to the start of the medication. The IP follows up with providers for any orders where criteria are not met. This review is conducted prior to any new start and after three days of therapy.

Data from this tool are collected and reported at monthly quality improvement meetings. Reporting this data offers opportunities to look at prescribing trends and offer feedback to providers. This systematic approach that embeds monitoring of orders into the nursing workflow reduces unnecessary nursing tasks and enables Brookside to align the antibiotics ordered with the facility's antibiogram. With systems for reporting antibiotic starts and communicating with providers in place, Brookside has successfully achieved a reduction in antibiotic starts that do not meet criteria for common infections.

h Based on an interview on April 17, 2018 with Tuesday VanTuyl, director of nursing, at Brookside Inn.

Core Element 7: Provider Education

Sustained, interactive, and multimodal education and training on principles and actions related to antibiotic stewardship are essential and must include all facility staff. Training may include in-services, participation in certificate programs, individualized feedback, and informal discussions among staff. Training should include not just education on stewardship and treatment practices, but also training in communication skills, the use of new technologies, tracking, and reporting. As many facilities lack access to dedicated infectious disease expertise, training during onboarding and as part of ongoing staff development for direct care providers, such as nurses and certified nursing assistants, can have a significant impact on the improved diagnosis and treatment of residents. Conversations around the country have emphasized that front line staff, especially nurses and certified nursing assistants, need clear and consistent support and education in antibiotic stewardship that can empower them to work with families and residents and prescribers, and that this training can serve as a much-needed area for professional growth and development in a field that is often limited in such opportunities.

Implementation Strategies

LOWER INTENSITY

- Include facility goals for antibiotic stewardship in facility materials, including staff manual, public materials, and website.
- Send a letter to all referring physicians, prescribers and facilities detailing expectations around antibiotic stewardship.
- Offer in-service education on antibiotic stewardship for all staff during onboarding.
- Make online stewardship modules available to all staff as part of ongoing staff development requirements.
- Reach out to local/state departments of health, hospitals, labs, and other community resources to identify existing education resources and opportunities.
- Invite laboratory staff to speak at the facility about best practices in microbiology, including data collection and review.
- Give prescribing clinicians and direct care staff treatment guides for high prevalence of antibiotic prescriptions, and keep guides at the nursing station for easy reference.[56]
- Integrate regular updates on antibiotic stewardship into communications tools (e.g., blogs, website, intranet, and employee newsletters).
- Train nurses to use Situation, Background, Assessment, and Recommendation (SBAR) forms as a "script" in communicating effectively to prescribing clinicians.[57]
- Educate direct care staff and prescribing clinicians through in-services and quality improvement meetings on facility assessment and treatment protocols.[58]

HIGH INTENSITY

- Develop a facility antibiotic stewardship training plan as part of a facility assessment. Identify specific training and education requirements for each provider group across the facility.
- Medical director and/or consultant pharmacist combine formal training with individual feedback on physician prescribing patterns. Offer specific guideline references or standard criteria.[59,60]
- Offer communication skills training for providers and direct care staff to improve dialogue with residents and families about antibiotics.
- Create or adapt scripts for nursing staff for dialogue with pharmacists and/or prescribing clinicians. Create decision algorithms for pharmacists when communicating with prescribers. Convene small-group educational sessions with multidisciplinary teams (prescribing clinicians and direct care staff), using real case examples to drive better prescribing.[61,62]
- Use reports on prescriber antibiotic use to provide benchmarks and educate facility staff about strategies to guide alternative approaches.
- Distribute a facility-specific antibiotic guide, based on recommended approaches for the management of common LTC infections and specific needs of facility, to all prescribing clinicians. Guide identifies specific antibiotic, administration, dosage, frequency, and duration of treatment recommendations according to the severity of the infection.[63]
- Integrate short examples of antibiotic stewardship into weekly educational mini-talks for direct care staff during shift change.
- Enter into agreements with community experts (e.g., public health agencies, universities, coalitions, acute care facilities) to secure regular education and technical assistance in antibiotic stewardship.
- Invest in antibiotic stewardship certification for key team members.
- Use EHR to create educational messages when prescribers prescribe an antibiotic that does not meet guidelines or does not include an indication.[64]

Potential Barriers and Suggested Solutions

Staff turnover complicates maintaining a fully trained staff.

Suggested Solutions

- Integrate training into onboarding.
- Include antibiotic stewardship training or skills in job descriptions and/or contracts.
- Offer training as an advancement opportunity to improve staff retention.
- Cross-train individuals within the facility team.
- Create a training plan that includes ongoing interactive training, as well as online modules and resources accessible to staff on demand.

Facility does not have the resources to implement custom education programs.

Suggested Solutions

- Look to external resources for free educational resources, including the CDC, AHRQ, QIN-QIOs, local healthcare collaboratives and public health agencies.
- Reach out to local and state departments of health, long-term care ombudsman offices, referring hospitals, laboratories or local university medical or pharmacy schools to request assistance in designing and delivering educational programming.
- Ask the laboratory to conduct a training on best practices in data collection and how to interpret both facility-specific and regional antibiograms.

Staff are not responding to education and training.

Suggested Solutions

- Emphasize antibiotic stewardship as a top resident safety and quality improvement priority.
- Embed antibiotic stewardship in staff development plans.
- Conduct a survey of the nursing and prescribing staff to assess attitudes and beliefs about antibiotic use and use findings to guide education.
- Consider using case examples and resident narratives to humanize data.

- Make education and training multidisciplinary, and ensure efforts are directed toward direct care staff as well as prescribing clinicians.
- Include educational approaches that focus on when NOT to prescribe an antibiotic.[65]
- Share outcome data with all clinical staff to demonstrate both positive impact of the education and target areas for improvement.
- Provide evidence-base for recommendation to not use antibiotics, and provide specific examples of what the facility will do to make the resident more comfortable.
- Provide individual prescriber data in comparison with global facility use data to demonstrate benchmark goal.
- Incorporate educational content in quality improvement meetings, resident care team meetings, or other standing interactions.

Staff do not have time to participate in educational opportunities.

Suggested Solutions

- Integrate training into existing workflows (e.g., shift change) and/or committee meetings.
- Administrative leaders define dedicated time to participate in educational opportunities.
- Use multiple educational formats and multiple trainings, including online modules, guideline summaries, pocket cards, posters, data review and discussion, case studies, and in-person training.

Facility is overwhelmed by the body of available educational materials.

Suggested Solutions

- Identify priority areas for training (e.g., diagnosis and prescribing for UTIs) and expand training program over time.
- Use free and existing tools that organize and prioritize resources for the facility.

Suggested Tools and Resources

Presentations, Webinars, and Videos (free)

- AHRQ Health TV YouTube. Antibiotic Stewardship in Nursing Homes: How You Can Prevent Antibiotic Resistance.
- CMS. Quality Improvement Organizations. Nursing Home Training Sessions in Antibiotic Stewardship.
- CMS. Quality Improvement Organizations. Webinars. Antibiotic Stewardship.
- Nebraska Antimicrobial Stewardship Assessment and Promotion Program. Video Series on Antimicrobial Stewardship in LTCF.
- Washington State Department of Health. EQuIP for Long-Term Care Facilities (LTC). Recorded Webinars.
- Nebraska Antimicrobial Stewardship Assessment and Promotion Program. Utilizing Already Available Tools for Antimicrobial Stewardship Implementation in Post-Acute and Long-Term Care Facilities. Webinar by Dr. M. Salman Ashraf.

Fact Sheets and Brochures

- CDC. Fact Sheet for Residents and Families: What You Need to Know About Antibiotics in a Nursing Home.
- National Nursing Home Quality Improvement Campaign. Infections Fact Sheets.

Decision Aids

- AHRQ. 12 Common Nursing Home Situations and Infection Control Guidelines for MRSA, C. Difficile, and VRE Pocket Cards.
- Arizona Department of Health Services. Breaking the Cycle: Asymptomatic Bacteriuria Pocket Card.
- Scottish Antimicrobial Prescribing Group. Decision Aid for Care Home Staff to Support Management of People with Diarrhoea.
- Scottish Antimicrobial Prescribing Group. Decision Aid for Diagnosis and Management of Suspected Urinary Tract Infection (UTI) in Older People.
- Alberta Health Services. Antimicrobial Stewardship Backgrounder: Aspiration Pneumonitis vs. Pneumonia.
- Massachusetts Infection Prevention Partnership: Suspect a Urinary Tract Infection? How Taking Antibiotics When You Don't Need Them Can Cause More Harm Than Good.

Education Planning Tools

- Minnesota Department of Health. Antimicrobial Stewardship Program Toolkit for Long-term Care Facilities. Nursing and Provider Antibiotic Use Attitudes and Beliefs Surveys.

Toolkits and Guides

- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Minimum Criteria for Common Infections Toolkit.
- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Common Suspected Infections: Communication and Decision making for Four Infections.
- Massachusetts Coalition for the Prevention of Medical Errors. Improving Evaluation of UTI in the Elderly.
- Michigan Antibiotic Resistance Reduction Coalition. Long-Term Care Toolkit.
- Nursing Home Quality Campaign. Implementing Change in Long-Term-Care: A Practical Guide to Transformation.
- Mody L, Greene M, Meddings J et al. A national implementation project to prevent catheter-associated urinary tract infection in nursing home residents. *JAMA Intern Med.* 2017;177(8):1154-1162.

Continuing Education Credit Opportunities

- CDC TRAIN. CDC Training on Antibiotic Stewardship. Section 1.
- COURSEsites. Improving the Care of Long-Term Care Facility Residents with Infections.
- Nebraska Infection Control Network. Primary Infection Prevention Course Long-Term Care.

Certificate Programs[i] (Course Fees May Apply)

- CMS & CDC. Specialized Infection Prevention and Control Training for Nursing Home Staff in the Long-Term Care Setting.
- SIDP/ASCP. Antimicrobial Stewardship. A Long-Term Care Certificate Program for Pharmacists.
- APIC EPI for Long-Term Care Education Series Online.
- American Association of Post-Acute Care Nursing (AADNS): Antibiotic Stewardship Program in Long-Term Care Virtual Workshop
- The National Association of Directors of Nursing Administration in Long-Term Care (NADONA) Antibiotic Stewardship Certificate of Mastery (ASCOM™)/Antibiotic Stewardship Specialist Certification (AS-BC™).

i In addition to national training and certification resources, state health departments may have certificate courses and other training programs available. Contact your health department for more information.

CASE STUDY

Provider Education in Nebraska Focuses on Good Data[j]

The Nebraska Antimicrobial Stewardship Assessment and Promotion Program (ASAP), a state-level initiative to promote antibiotic stewardship programs in Nebraska, works with seven long-term care facilities to provide centralized expertise in ASP implementation. Funded by the Nebraska Department of Health and Human Services Healthcare-Associated Infection Team, the program's goal is to empower facilities to initiate or improve their antibiotic stewardship programs. The ASAP provides both formal educational activities and tools and informal educational support to facilities during their regular interactions with the participating programs. Examples of educational events include webinars, videos, and a statewide summit on antibiotic stewardship.

The program finds that providers are especially receptive to modifying their practices so they align with nationally recognized guidelines and management protocols. Sharing these guidelines and management protocols is a highly effective strategy for educating those providers in appropriate antibiotic prescribing. Using data to persuade clinicians why they need to change and sharing the protocols to educate them on how to change often results in better provider responses to education and contribute to expanding staff's understanding of the need for appropriate antibiotic prescribing. For example, an ASAP medical director was reviewing the facility's antibiotic data with the long-term care facility medical director and noticed many ciprofloxacin prescriptions on the antibiotic use report even though almost 50 percent of *E. coli* isolates were resistant to this agent according to their facility specific antibiogram. He reported the following discussion:

> *"It looks like providers at your facility are starting a lot of residents on ciprofloxacin," says the ASAP medical director.*

"Well, yes, I guess we do, and we have not noticed any significant issues," says the LTCF medical director.

> *"But if we look at the facility data, it is clear that almost 50 percent of your E.coli isolates, the predominant organisms identified from urine cultures, are resistant to ciprofloxacin. In addition, I also noticed that many of these prescriptions are getting switched after a couple of days, most likely due to culture result showing resistance to ciprofloxacin…" says the ASAP medical director.*

"That's a good point, I never reviewed the antibiotic use and resistance data in this way," says the LTCF medical director. "We are going to change our practice."

j Based on a May 17, 2018 interview with Drs. Salman Ashraf, Scott Bergman, Philip Chung, and Trevor Van Schooneveld and materials from the University of Nebraska Medical Center, Nebraska Antimicrobial Stewardship Assessment and Promotion Program (ASAP).

Core Element 8:
Resident and Family Engagement and Education

The unique characteristics of post-acute and long-term care make specific attention to resident and family engagement and education a must. In post-acute and long-term care facilities, residents stay for a longer period of time; they have limited direct interaction with physicians or other prescribing providers; and processes are very much oriented to address family and resident concerns, which increases the potential influence that residents and families can have on treatment decisions. Healthcare professionals want to provide good care, and families and residents want to help their loved ones. Antibiotic stewardship can offer an opportunity to improve communication between the facility staff and residents and family members. Such stewardship includes both formal efforts to engage residents and families, such as letters and fact sheets, and informal discussions that foster better understanding of care strategies.

As a standard of care in the facility, staff members should clearly explain the case for the diagnosis, and if appropriate, explain why an antibiotic is not recommended. To emphasize the focus on care for the resident, a positive action should be identified when an antibiotic is not prescribed. For example, staff might say, "We will watch your loved one closely and continue to provide care that will help him/her feel better, such as cough suppressant, throat lozenges, hydration, and Tylenol for pain." In addition, staff can identify possible active steps family members can take to address resident concerns (e.g., offer fluids, comfort care). Such active engagement by family members may empower them to help directly rather than ask for an antibiotic. Finally, staff members should offer a back-up plan of what will be done in case of no improvements in the resident's condition so as to reassure residents and their families.

Implementation Strategies

LOWER INTENSITY

- Provide antibiotic stewardship educational materials to families and residents at multiple touch points (e.g., facility admission, in common areas, at time of diagnosis.)
- Send a letter within 1-2 weeks of admission to all families describing the facility's culture of stewardship, quality improvement goals, and actions and policies.
- Work with resident and family councils to provide educational materials and foster dialogue about specific infections and treatments and the facility's active monitoring strategies.[k,66]
- Show an antibiotic stewardship video at a resident/family council meeting and then discuss the topic.
- Offer pocket cards or guides to families that suggest what they can do to help the resident (e.g., offer fluids/ice, re-orient them to time and place).
- Reach out to the long-term care ombudsman or state public health departments for training or educational program support on antibiotic use.[67]

k Also referred to as active surveillance, watchful waiting, or observation.

HIGH INTENSITY

- Include a representative from the resident/family council on the antibiotic stewardship team; co-create a facility family/resident engagement plan.
- Provide direct care staff with scripts and "decision flowcharts" to assist with resident/family dialogue.
- Train clinical staff to use case studies, communication tools, and scripts and conduct role play exercises with residents and families.
- Create resident/family case studies to give the benefits of stewardship a human story; use in educational forums, individual discussions, and monthly newsletters.
- Train family/residents to act as "stewardship spokespersons," and educate fellow families and residents.
- Involve the nursing director, facility staff, or the consulting infectious disease expert during care team meetings to address antibiotic use for a specific resident and to discuss alternative approaches.
- Translate educational tools and scripts into appropriate languages for residents and families; reach out to public health departments and referring hospitals to identify existing resources that meet this need.

Potential Barriers and Suggested Solutions

Family members insist on antibiotic treatment for nonspecific symptoms.

Suggested Solutions

- Review resident assessment findings and share educational materials with the family to make the case for why an antibiotic is not needed.
- Provide residents and families with a contingency plan when an antibiotic is not indicated, such as "active monitoring" and outline steps of what will be done if the resident's condition does not improve.
- Discuss treatments that will alleviate symptoms and ensure that the resident is comfortable.
- Train providers to use palliative and empathetic communication approaches.
- Use the opportunity of an antibiotic time out or change in therapy (i.e., based on lab data) to foster a learning dialogue between medical staff, the prescriber, and residents/family members.

Existing educational materials are vague or focus on concepts not immediately relevant to family members and residents (e.g., general information regarding antibiotic resistance).

Suggested Solutions

- Identify educational materials that are more specific to the family member's concerns (e.g., about UTI symptoms).
- Work with residents/families to develop facility-relevant case studies and other educational materials that clarify concerns and solutions.
- Ask local university students, the department of health, or QIN-QIO to develop case examples to demonstrate better decision making.

Facility does not have the capacity to conduct trainings for family members.

Suggested Solutions

- Make use of available free educational materials and provide to residents and families at regular intervals.
- Reach out to the local public health department, QIN-QIO, university, or ombudsman office for specific educational opportunities.
- Engage the resident and family councils to host an educational program.
- Incorporate education discussions during care team meetings led by clinical consulting experts, Minimum Data Set (MDS) coordinator, DON, or medical director.

Resident/family council does not have capacity to participate in facility-wide quality improvement initiatives like antibiotic stewardship.

Suggested Solutions

- Ask resident/family members to review antibiotic stewardship educational materials and protocols prior to distribution to ensure plain language and address resident and family perspectives.
- Invite a member of the community to participate in the stewardship committee (e.g., former staff member, community leader, city council member).
- Engage the activities director to work with residents to create "stories" about better antibiotic use.

Suggested Tools and Resources

Communication Tools

- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Managing Resident and Family Expectations.
- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Talking with Residents.
  - Short Version
  - Long Version
- University of Rochester Nursing Home Collaborative. Asymptomatic Bacteriuria Family Letter. Monroe Community Hospital.

Active Monitoring Materials

- Rochester Nursing Home Collaborative. Active Monitoring Verbal Communication Guide and Documentation Form.

Fact Sheets, Brochures and Decision Aids

- CDC. Antibiotics Related Fact Sheets.
- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Be Smart about Antibiotics: Prevent Hospital Acquired Infections Handout.
- AHRQ. Nursing Home Antimicrobial Stewardship Guide: Resident Information Sheet Antibiotic-Resistant Bacteria.
- Nebraska Antimicrobial Stewardship Assessment and Promotion Program. Roadmap for Sensible Antibiotic Use.
- Massachusetts Coalition for the Prevention of Medical Errors. When Do You Need An Antibiotic?
- Rochester Nursing Home Collaborative. Antibiotics for UTI in Older Adults Fact Sheet.
- Massachusetts Infection Prevention Partnership. Suspect a Urinary Tract Infection? How Taking Antibiotics When You Don't Need Them Can Cause More Harm Than Good.
- SHEA. For Our Patients and Their Visitors: Help Prevent Infections Fact Sheet.

Toolkits and Guides

- CDC. Be Antibiotics Aware: Stakeholder Toolkit.
- AHRQ. Nursing Home Antimicrobial Stewardship Guide. Educate and Engage Residents and Family Members.

Presentations, Webinars, Videos

- Partnering to Prevent Catheter-Associated Urinary Tract Infections (CAUTI): HRET and the CAUTI-LTC Program.
- AHRQ Health TV YouTube. Antibiotic Stewardship in Nursing Homes: How You Can Prevent Antibiotic Resistance.
- New York State Department of Health YouTube. Educating Patients about Antibiotic Usage.

CASE STUDY

Consistency, Transparency, and Trust: Keys to Resident and Family Engagement[l]

At New Horizons, engaging residents and family members in antibiotic stewardship is integral to a larger ethos of ongoing improvement in nursing home care. The facility is part of the Northeast Georgia Health System and is located in Gainesville, Georgia. Three factors that support resident and family engagement at this facility include:

Consistent Point of Contact. The Morning Assessor serves as the first point of contact for residents and families during the admission process, where she can assess the resident's entire medical record, including antibiotic use. Throughout a resident's stay and especially when concerns over a resident's health arise, the MDS coordinator, serves as the main point of contact for concerned family members.

Transparency in Process. Central to New Horizons engagement of residents and families in antibiotic stewardship are established protocols for antibiotic use. When residents and/or family members bring concerns over possible infections, all providers and nursing staff are trained to implement "stop and watch" protocols and to refer residents to the nurse manager. The MDS coordinator is able to meet with the resident or their family and explain the established protocol, providing a hard copy. Together they review the protocol and discuss how they will monitor symptoms and what criteria must be met for further testing and for antibiotics to be ordered.

Building Trust in the Process. With defined key points of contact and a clear protocol in place, residents and family members know what to expect and whom to contact with concerns. Also important is the trust that residents and family members have that the facility staff will keep them well informed throughout care decision making. At New Horizons, the nursing staff proactively contact family members with *any* change in resident status, whether that is in symptoms or medication orders.

l Based on interviews with Dr. Swati Gaur on 4/5/18 and on 4/16/18 with Ms. Lori Woods, Nursing Manager/MDS Coordinator, Ms. Audra Clemmons, Nursing Coordinator, and Dr. Emily McWhorter, Consultant Pharmacist at New Horizons.

MEASUREMENT APPROACHES

Performance measurement is the cornerstone of any quality improvement program, and it is important for antibiotic stewardship. The reality in many long-term settings is that data tracking and measurement remains a paper-based enterprise. While use of electronic health records (EHRs) continues to increase, many facilities will need to use spreadsheets (e.g., Microsoft Excel, Google Sheets, etc.) to capture and document trends. Regardless of where a facility starts, the important launching point is to identify and consistently track at least one process and one outcome measure of antibiotic use and antibiotic resistance since measures are required by the CMS conditions of participation and the Joint Commission Medication Management Standards.[68] Starting this way allows the facility to develop experience, manage continuous improvement efforts, and integrate measurement into existing practice over time.

This section of the *NQP™ Playbook* builds on the CDC's Tracking and Reporting Core Elements of Antibiotic Stewardship for Nursing Homes. While NQF-endorsed performance measures specific to antibiotic stewardship in post-acute and long-term care settings are not yet available, the example measures describe below represent as starting point for tracking and can help post-acute and long-term care facilities meet measurement requirements and accelerate the use of data for improving antibiotic use. For specific resources that can assist with measurement, readers should refer to those resources listed in the Tracking and Reporting sections.

Process Measures

Process measures focus on specific activities to improve an identified outcome. These measures are critically important because they measure efforts to systematize quality improvement.[69] The CDC breaks down process measures to differentiate those related to antibiotic activities (e.g., documentation and guideline adherence) and antibiotic use.[70] Examples of data collection that could be used for process measures are included below.

EXAMPLE PROCESS MEASURES: ANTIBIOTIC ACTIVITIES

- Documented indication with each antibiotic start*
- Adherence to facility specific guidelines for diagnosing and prescribing (e.g., UTI and SSTI)
- Percent of antibiotic orders for which a time-out or review was conducted within 72 hours of the start of the antibiotic.
- Number of antibiotic changes or antibiotic stop orders occurring over the course of treatment
- Number of times appropriate cultures are obtained before antibiotics are initiated
- Change in number of labs ordered
- Antibiotics not prescribed for asymptomatic bacteriuria
- Change in the number of antibiotics prescribed (expressed as number and percent)
- Completeness of clinical assessment documentation at the time of prescription
- Completeness of antibiotic prescribing documentation
- Timely referral to acute care facilities in cases of suspected sepsis or *C. difficile*

Calculating Antibiotic Starts and Days of Therapy

Antibiotic starts and days of therapy are two common stewardship measures. A facility might calculate antibiotic starts in this way:

(Number of new antibiotic starts/Total number of resident days) x 1000 = Rate of antibiotic starts

A measure of days of therapy for a facility requires some additional work, but may provide a better picture of changes in antibiotic use. Understanding that days of therapy means the sum of all antibiotic days for all residents in the facility during a given time frame (e.g., 1 month or 1 quarter), then a facility should calculate:

(Total monthly DOT/total monthly resident-days) X 1,000 = Antibiotic days of therapy[71]

Outcome Measures

Outcome measures represent the changes in the health of a population, community, or individual as a result of specific interventions. For example, post-acute and long-term care facilities are required to report adverse health events, such as diagnoses of *C. difficile*, MRSA, and UTIs, to CMS and the CDC's National Healthcare Safety Network includes these events in their reporting fields. A decrease in infection rates may represent improved understanding of the basic concept of colonization versus infection and better adherence to established surveillance criteria.

EXAMPLES OF OUTCOME MEASURES:

- Rates of urinary tract infections
- Number of urine cultures ordered
- Rates of respiratory infections
- Rates of skin and soft-tissue infections
- Rates of C. *difficile*
- Rates of antibiotic resistance to most commonly used antibiotics
- Referrals to the hospital
- Pharmacy costs (e.g., antibiotic costs per admission and per day)

Getting Started

Facilities can use a retrospective review of antibiotic use data (e.g., by the consultant pharmacist) or an internal assessment of infection prevalence (e.g., by the infection preventionist) to identify potential targets for measurement. Mapping a facility's current processes for assessing, diagnosing, and treating suspected infection in long-term care residents is an important preliminary step to choosing target measures. Once selected, facilities can define best methods given existing work processes and paper versus electronic resources to reliably capture process and outcome data. In addition, the facility should clearly identify the team responsible for data collection and ensure adequate training on required fields, definitions, level of detail, and where such data are housed. Finally, there should be frequent review and feedback about collection of measurement data to ensure accuracy and opportunity for training and professional development in this skillset.

DRIVERS OF CHANGE

Several key areas can accelerate the implementation of antibiotic stewardship initiatives in post-acute care and long-term care settings, including technology, accreditation, and public reporting. Federal entities, accreditation agencies, and partners in quality improvement should support action in these areas to continue the advancement of antibiotic stewardship in post-acute and long-term care.

Technology Considerations

Research indicates that over 64 percent of long-term facilities now use electronic health records.[72] While this finding indicates that a majority of facilities have an EHR, there is likely great variation in facilities' capacity to use that EHR effectively for the purposes of antibiotic stewardship. Facilities with EHRs often use them for administrative rather than clinical or quality improvement purposes. Interviews with many experts suggest that some of the basic requirements for antibiotic stewardship, such as matching an indication with an antibiotic, are difficult to capture within an EHR. Others report that the frequency of notifications about antibiotic "best practices" is too high, resulting in team members becoming desensitized to the notification and less likely to act when a notification is received. Nonetheless, facilities that have implemented EHRs, either in partnership with affiliated hospitals or independently, report higher ability to share data and information across facilities, and a better capacity to track antibiotic use. As reporting requirements continue to move towards standardization of data and interoperability, post-acute and long-term care facilities will need guidance and support to further leverage their EHR capabilities.

Accreditation

Including antibiotic stewardship in accreditation can be an important incentive to secure leadership and funding support for implementing antibiotic stewardship programs in post-acute and long-term care facilities. Accrediting and regulatory organizations have begun to move towards including antibiotic process and outcome measures in their accreditation requirements and reporting systems. The inclusion of antibiotic stewardship regional and statewide Quality Innovation Network-Quality Improvement Organizations (QIN-QIOs), microbiology labs, and state departments of health may offer both useful resources and training in the use of these reporting mechanisms.

The Joint Commission (TJC)—a nonprofit organization that accredits and certifies more than 20,000 U.S. healthcare organizations and programs and over 1,000 post-acute and long-term care facilities—has established antimicrobial stewardship **Medication Management Standards** (MM.09.01.01). As part of its accreditation requirements, accredited facilities must meet the following standards, which align with the CDC Core Elements:

- Leaders establish antibiotic stewardship as a priority
- Educate staff and independent contractors
- Educate residents and families
- Establish an antibiotic stewardship team
- Address the CDC Core Elements
- Utilize treatment protocols
- Collect, analyze, and report on antibiotic data and outcomes.[73]

Public Reporting

Public reporting requirements can be an added incentive to help spur the implementation of antibiotic stewardship programs in post-acute and long-term care facilities. The **National Healthcare Safety Network (NHSN)** is a voluntary electronic healthcare-associated infection (HAI) surveillance system through the CDC. The NHSN can provide facilities with data needed to track medication use, identify adverse medical events, and measure progress towards the goal of eliminating HAIs. The long-term care component of the National Health Safety Network (NHSN) focuses on reporting on CDI, MRSA and drug-resistant infections, and UTIs. As part of a national quality initiative, regional QIN-QIOs are supporting facilities in understanding surveillance reporting and gaining experience with existing data tracking tools. For example, QIN-QIO collaboration to support surveillance reporting on *C. difficile* and antibiotic starts for UTI is ongoing.[74]

The **Improving Medicare Post-Acute Care Transformation (IMPACT) Act** requires long-term care facilities to report patient data through **the Minimum Data Set (MDS)**, and is part of the federally mandated process for clinical assessment of all residents in Medicare- or Medicaid-certified nursing homes. This process provides a comprehensive assessment of each resident and helps nursing home staff identify health problems. MDS assessment forms are completed for all residents in certified nursing homes, regardless of source of payment for the individual resident. The assessments are required for residents on admission to the nursing facility and then periodically, within specific guidelines and time frames. In most cases, participants in the assessment process are licensed healthcare professionals employed by the nursing home. MDS information is transmitted electronically by nursing homes to the MDS database in their respective states and subsequently to the national MDS database at CMS. While this process is not distinctly focused on tracking and reporting antibiotic use data, facilities may look to train and collaborate with MDS coordinators as an important resource for tracking antibiotic stewardship data.

CALL TO ACTION

The national focus on improving quality of care and an international concern for the consequences of inappropriate antibiotic use have expanded the call to action for antibiotic stewardship in all healthcare settings. Optimizing antibiotic use in post-acute and long-term care facilities is an essential step to improve care for the millions of vulnerable residents in such settings. The suggested strategies and case studies found in this *NQP Playbook™* build on the CDC's Core Elements, and emphasize practical approaches that consider the unique challenges and capabilities of thousands of dedicated staff working in these settings and providing care to residents and their families. Throughout the process of creating this *NQP Playbook™*, front-line experts consistently emphasized the success factors in implementing antibiotic stewardship in post-acute and long-term care facilities:

- Connect antibiotic stewardship with overall safety and quality initiatives;
- Identify champions who can lead antibiotic stewardship in a facility;
- Embrace a broad concept of "team";
- Include everyone involved in resident care in antibiotic stewardship;
- Start with a few key data points;
- Focus on small steps first;
- Keep approaches relevant to the facility;
- Empower and train direct care givers and nursing staff in antibiotic stewardship;
- Use existing resources, especially the many that are freely available; and
- Collaborate with community partners to improve antibiotic use.

The National Quality Forum is issuing a call to action for post-acute and long-term care settings, to promote appropriate antibiotic use to protect the health of residents. The *NQP Playbook™: Antibiotic Stewardship in Post-Acute and Long-Term Care* is an important tool for providing these facilities practical strategies to improve antibiotic use and navigate the ever-growing landscape of resources available to support antibiotic stewardship programs. All who are connected to the care of residents in these settings—from administrators and clinical directors to nursing assistants and families—will find strategies and resources that will help them work together to commit to action.

The National Quality Forum is issuing a call to action for post-acute and long-term care settings, to promote appropriate antibiotic use to protect the health of residents. The *NQP Playbook™: Antibiotic Stewardship in Post-Acute and Long-Term Care* is an important tool for providing these facilities practical strategies to improve antibiotic use and navigate the ever-growing landscape of resources available to support antibiotic stewardship programs.

ENDNOTES

1 Centers for Disease Control and Prevention (CDC). *Antibiotic Resistance Threats in the United States, 2013.* Atlanta, GA: CDC; 2013. https://www.cdc.gov/drugresistance/threat-report-2013/. Last accessed April 2017.

2 CDC. Vital signs: containing unusual resistance website. https://www.cdc.gov/vitalsigns/containing-unusual-resistance/. Last accessed April 2018.

3 Band VI, Satola SW, Burd EM, et al. Carbapenem-resistant Klebsiella pneumoniae exhibiting clinically undetected colistin heteroresistance leads to treatment failure in a murine model of infection. *mBio.* 2018;9(2):e02448-17. https://doi.org/10.1128/mBio.02448-17. Last accessed June 2018.

4 Maple PAC, Hamilton-Miller JMT, Brumfitt W. World-wide antibiotic resistance in methicillin-resistant Staphylococcus aureus. *Lancet*. 1989;333(8637):537-540. https://www.sciencedirect.com/science/article/pii/S0140673689900767. Last accessed June 2018.

5 World Health Organization (WHO).) *Global Priority List of Antibiotic Resistant Bacteria to Guide Research, Discovery, and Development of New Antibiotics.* Geneva, Switzerland: WHO; 2017. http://www.who.int/medicines/publications/WHO-PPL-Short_Summary_25Feb-ET_NM_WHO.pdf?ua=1. Last accessed June 2018.

6 The world is running out of antibiotics, WHO report confirms [news release]. Geneva, Switzerland: WHO; September 20, 2017. http://www.who.int/mediacentre/news/releases/2017/running-out-antibiotics/en/. Last accessed June 2018.

7 Davey P, Brown E, Charani E, et al. Interventions to improve antibiotic prescribing practices for hospital inpatients. *Cochrane Database Syst Rev*. 2017;2:CD003543.

8 Malani AN, Richards PG, Kapila S, et al. Clinical and economic outcomes from a community hospital's antimicrobial stewardship program. *Am J Infect Control.* 2013;41(2):145-148.

9 Manning ML, Septimus EJ, Ashley ESD, et al. Antimicrobial stewardship and infection prevention-leveraging the synergy: A position paper update. *Am J Infect Control.* 2018;46(4):364-368.

10 CDC. *The Core Elements of Antibiotic Stewardship for Nursing Homes.* Atlanta, GA: US Department of Health and Human Services, CDC; 2015. https://www.cdc.gov/longtermcare/pdfs/core-elements-antibiotic-stewardship.pdf. Last accessed June 2018.

11 CDC. *Antibiotic Use in the United States, 2017: Progress and Opportunities.* Atlanta, GA: US Department of Health and Human Services, CDC; 2017. https://www.cdc.gov/antibiotic-use/stewardship-report/pdf/stewardship-report.pdf. Last accessed June 2018.

12 CDC. *Antibiotic Use in the United States, 2017: Progress and Opportunities*. Atlanta, GA: US Department of Health and Human Services, CDC; 2017. https://www.cdc.gov/antibiotic-use/stewardship-report/pdf/stewardship-report.pdf. Last accessed June 2018.

13 Centers for Medicare & Medicaid Services (CMS). Medicare Medicaid Programs; Reform of requirements for long-term care facilities. *Federal Register.* 2016;81(192):68688-68872. https://www.federalregister.gov/documents/2016/10/04/2016-23503/medicare-and-medicaid-programs-reform-of-requirements-for-long-term-care-facilities. Last accessed June 2018.

14 Sloane P, Huslage K, Kistler C, et al. Optimizing antibiotic use in nursing homes through antibiotic stewardship. *N C Med J*. 2016;77(5):324-329.

15 Crnich CJ, Jump R, Trautner B, et al. Optimizing antibiotic stewardship in nursing homes: a narrative review and recommendations for improvement. *Drugs Aging.* 2015;32(9):699-716.

16 Katz PR, Karuza J, Kolassa J, et al. Medical practice with nursing home residents: results from the National Physician Professional Activities census. *J Am Geriatr Soc.* 1997;45(8):911-917.

17 Olans RD, Olans RN, Witt DJ. Good nursing is good antibiotic stewardship. *Am J Nurs.* 2017;117(8):58-63. https://www.ncbi.nlm.nih.gov/pubmed/28749885. Last accessed June 2018.

18 McElligott M, Welham G, Pop-Vicas A, et al. Antibiotic stewardship in nursing facilities. *Infect Dis Clin North Am.* 2017;31(4):619-638. http://dx.doi.org/10.1016/j.idc.2017.07.008. Last accessed June 2018.

19 McElligott M, Welham G, Pop-Vicas A, et al. Antibiotic stewardship in nursing facilities. *Infect Dis Clin North Am.* 2017;31(4):619-638. http://dx.doi.org/10.1016/j.idc.2017.07.008. Last accessed June 2018.

20 CDC. *The Core Elements of Antibiotic Stewardship for Nursing Homes.* Atlanta, GA: US Department of Health and Human Services, CDC; 2015. https://www.cdc.gov/longtermcare/pdfs/core-elements-antibiotic-stewardship.pdf. Last accessed June 2018.

21 Carter R, Montpetite M, Jump R. Mixed-methods pilot study to assess perceptions of antimicrobial stewardship in nursing homes. *J Am Geriatr Soc*. 2017;65(5):1073-1078. https://onlinelibrary.wiley.com/doi/full/10.1111/jgs.14766. Last accessed June 2018.

22 McElligott M, Welham G, Pop-Vicas A, et al. Antibiotic stewardship in nursing facilities. *Infect Dis Clin North Am.* 2017;31(4):619-638. http://dx.doi.org/10.1016/j.idc.2017.07.008. Last accessed June 2018.

23 Olans RD, Olans RN, Witt DJ. Good nursing is good antibiotic stewardship. *Am J Nurs.* 2017;117(8):58-63. https://www.ncbi.nlm.nih.gov/pubmed/28749885. Last accessed June 2018.

24 Kullar R, Yang H, Grein J, et al. A roadmap to implementing antimicrobial stewardship principles in long-term care facilities: collaboration between an acute-care hospital and LTCFs. *Clin Infect Dis.* 2018;66(8):1304-1312. https://www.ncbi.nlm.nih.gov/pubmed/29182743. Last accessed June 2018.

25 Dumyati G, Stone ND, Nace DA, et al. Challenges and strategies for prevention of multidrug-resistant organism transmission in nursing homes. *Curr Infect Dis Rep.* 2017;19(4):18. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5382184/. Last accessed June 2018.

26 Minnesota Department of Public Health. Long-term care honor roll: Minnesota antibiotic stewardship website. http://www.health.state.mn.us/onehealthabx/honor/honorltc.html. Last accessed June 2018.

27 Martin CM. Antibiotic stewardship: new frontier, familiar journey. *Consult Pharm.* 2017;32 Suppl A(5)27-32. https://doi.org/10.4140/TCP.n.2017.134. Last accessed June 2018.

28 Cosgrove SE, Hermsen ED, Rybak MJ, et al. Guidance for the knowledge and skills required for antimicrobial stewardship leaders. *Infect Control Hosp Epidemiol.* 2014;35(12):1444–1451.

29 McElligott M, Welham G, Pop-Vicas A, et al. Antibiotic stewardship in nursing facilities. *Infect Dis Clin North Am.* 2017;31(4):619-638. http://dx.doi.org/10.1016/j.idc.2017.07.008. Last accessed June 2018.

30 Kullar R, Yang H, Grein J, et al. A roadmap to implementing antimicrobial stewardship principles in long-term care facilities: collaboration between an acute-care hospital and LTCFs. *Clin Infect Dis.* 2018;66(8):1304-1312. https://www.ncbi.nlm.nih.gov/pubmed/29182743. Last accessed June 2018.

31 Banks R, Viau R, Wilson B, et al. At a rural Veterans Affairs medical center, telehealth decreased antibiotic use in long-term, but not acute care. *Open Forum Infect Dis.* 2017;4(Suppl 1):S275. https://doi.org/10.1093/ofid/ofx163.613. Last accessed June 2018.

32 Beaulac K, Corcione S, Epstein L, et al. Antimicrobial stewardship in a long-term acute care hospital using offsite electronic medical record audit. *Infect Control Hosp Epidemiol.* 2016;37(4):433-439. http://doi.org/10.1017/ice.2015.319. Last accessed June 2018.

33 McElligott M, Welham G, Pop-Vicas A, et al. Antibiotic stewardship in nursing facilities. *Infect Dis Clin North Am.* 2017;31(4):619-638. http://dx.doi.org/10.1016/j.idc.2017.07.008. Last accessed June 2018.

34 Agency for Healthcare Research and Quality (AHRQ). 12 Common Nursing Home Situations and Infection Control Guidelines for MRSA, C. Difficile, and VRE Pocket Cards. Rockville, MD: AHRQ; 2014. https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/4_TK2_T2-Antibiotic_Pocket_Cards.pdf. Last accessed June 2018.

35 Agency for Healthcare Research and Quality (AHRQ). Nursing home antimicrobial stewardship guide: Toolkit 1: Start an antibiotic stewardship program website. https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/3_TK1_T2-Roles_and_Responsibilities_final.pdf. Last accessed June 2018.

36 Chopra T, Goldstein EJ. Clostridium difficile infection in long-term care facilities: A call to action for antimicrobial stewardship. *Clin Infect Dis*. 2015;60(2):S72-76.

37 The Joint Commission. Approved: new antimicrobial stewardship standard. *Joint Commission Perspectives®*. 2016;36(7):1-8. https://www.jointcommission.org/assets/1/6/New_Antimicrobial_Stewardship_Standard.pdf. Last accessed June 2018.

38 Kullar R, Yang H, Grein J, et al. A roadmap to implementing antimicrobial stewardship principles in long-term care facilities: collaboration between an acute-care hospital and LTCFs. *Clin Infect Dis.* 2018;66(8):1304-1312. https://www.ncbi.nlm.nih.gov/pubmed/29182743. Last accessed June 2018.

39 McElligott M, Welham G, Pop-Vicas A, et al. Antibiotic stewardship in nursing facilities. *Infect Dis Clin North Am.* 2017;31(4):619-638. http://dx.doi.org/10.1016/j.idc.2017.07.008. Last accessed June 2018.

40 Jump RLP, Gaur S, Katz MJ, et al. Template for an antibiotic stewardship policy for post-acute and long-term care settings. *J Am Med Dir Assoc*. 2017;18(11):913-920. https://doi.org/10.1016/j.jamda.2017.07.018. Last accessed June 2018.

41 Sloane PD, Huslage K, Kistler C, et al. Optimizing antibiotic use in nursing homes through antibiotic stewardship. *N C Med J.* 2016;77(5):324-329. http://doi.org/10.18043/ncm.77.5.324. Last accessed June 2018.

42 Martin CM. Antibiotic stewardship: new frontier, familiar journey. *Consult Pharm.* 2017;32 Suppl A(5):27-32.

43 Martin CM. Antibiotic stewardship: new frontier, familiar journey. *Consult Pharm.* 2017;32 Suppl A(5):27-32.

44 Sloane PD, Huslage K, Kistler C, et al. Optimizing antibiotic use in nursing homes through antibiotic stewardship. *N C Med J.* 2016;77(5):324-329. http://doi.org 10.18043/ncm.77.5.324. Last accessed June 2018.

45 Fisch J, McNamara S, Lansing B, et al. The 24-hour report as an effective monitoring and communication tool in infection prevention and control in nursing homes.

Am J Infect Control. 2014; 42(10):1112–1114. https://doi.org/10.1016/j.ajic.2014.07.001. Last accessed June 2018.

46 Sloane PD, Huslage K, Kistler C, et al. Optimizing antibiotic use in nursing homes through antibiotic stewardship. *N C Med J.* 2016;77(5):324-329. http://doi.org/10.18043/ncm.77.5.324. Last accessed June 2018.

47 Sloane PD, Huslage K, Kistler C, et al. Optimizing antibiotic use in nursing homes through antibiotic stewardship. *N C Med J.* 2016;77(5):324-329. http://doi.org/10.18043/ncm.77.5.324. Last accessed June 2018.

48 Kullar R, Yang H, Grein J, et al. A roadmap to implementing antimicrobial stewardship principles in long-term care facilities: collaboration between an acute-care hospital and LTCFs. *Clin Infect Dis.* 2018;66(8):1304-1312. https://www.ncbi.nlm.nih.gov/pubmed/29182743. Last accessed June 2018.

49 Kapadia SN, Abramson EL, Carter EJ, et al. The expanding role of antimicrobial stewardship programs in hospitals in the United States: lessons learned from a multisite qualitative study. *Jt Comm J Qual Patient Saf*. 2018;44(2):68-74. https://doi.org/10.1016/j.jcjq.2017.07.007. Last accessed June 2018.

50 Qualis Health. Antibiotics time out sample policy website. http://medicare.qualishealth.org/resources/antibiotictimeout. Last accessed June 2018.

51 Stone ND, Ashraf MS, Calder J, et al. Surveillance definitions of infections in long-term care facilities: revisiting the McGeer criteria. *Infect Control Hosp Epidemiol.* 2012;33(10):965-977. https://doi.org/10.1086/667743. Last accessed June 2018.

52 Loeb M, Bentley DW, Bradley S, et al. Development of minimum criteria for the initiation of antibiotics in residents of long-term-care facilities: results of a consensus conference. *Infect Control Hosp Epidemiol.* 2001;22(2):120-124. https://doi.org/10.1086/501875. Last accessed June 2018.

53 Zarowitz BJ, Allen C, Tangalos E, et al. Algorithms promoting antimicrobial stewardship in long-term care. *J Am Med Dir Assoc.* 2016;17(2):173-178. https://doi.org/10.1016/j.jamda.2015.11.017. Last accessed June 2018.

54 AHRQ. *Toolkit 3: The Nursing Home Antibiogram Program Toolkit: How to Develop and Implement an Antibiogram Program.* Rockville, MD: AHRQ; 2016. http://www.ahrq.gov/nhguide/toolkits/help-clinicians-choose-the-right-antibiotic/toolkit3-develop-implement-antibiogram-program.html. Last accessed June 2018.

55 AHRQ. Phase 2 Checklist for Identifying Nursing Home Specific Antibiogram Modifications. In: *Toolkit 3: The Nursing Home Antibiogram Program Toolkit: How to Develop and Implement an Antibiogram Program.* Rockville, MD: AHRQ; 2016. https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/5_TK2_P2T7-Checklist_for_Identifying_Nursing_Home_Specific_Antibiogram_Modifications_Phase_2.pdf. Last accessed June 2018.

56 Monette J, Miller MA, Monette M, et al. Effect of an educational intervention on optimizing antibiotic. prescribing in long-term care facilities. *J Am Geriatr Soc.* 2007;55(8):1231-1235. https://doi.org/10.1111/j.1532-5415.2007.01250.x. Last accessed June 2018.

57 Kullar, R, Yang H, Grein J, et al. A roadmap to implementing antimicrobial stewardship principles in long-term care facilities (LTCFs): Collaboration between an acute-care hospital and LTCFs. *Clin Infect Dis.* 2018;66(8);1304-1312. https://doi.org/10.1093/cid/cix1041. Last accessed June 2018.

58 Kullar, R, Yang H, Grein J, et al. A roadmap to implementing antimicrobial stewardship principles in long-term care facilities (LTCFs): Collaboration between an acute-care hospital and LTCFs. *Clin Infect Dis.* 2018;66(8);1304-1312. https://doi.org/10.1093/cid/cix1041. Last accessed June 2018.

59 Kullar, R, Yang H, Grein J, et al. A roadmap to implementing antimicrobial stewardship principles in long-term care facilities (LTCFs): Collaboration between an acute-care hospital and LTCFs. *Clin Infect Dis.* 2018;66(8);1304-1312. https://doi.org/10.1093/cid/cix1041. Last accessed June 2018.

60 Smith PW, Watkins K, Miller H, et al. Antibiotic stewardship programs in long-term care facilities. *Ann Longterm Care.* 2011;19(4):20-25.

61 McElligott M, Welham G, Pop-Vicas A, et al. Antibiotic stewardship in nursing facilities. *Infect Dis Clin North Am.* 2017;31(4):619-638. http://dx.doi.org/10.1016/j.idc.2017.07.008. Last accessed June 2018.

62 Katz MJ, Gurses AP, Tamma PD, et al. Implementing antimicrobial stewardship in long-term care settings: an integrative review using a human factors approach. *Clin Infect Dis*. 2017;65(11)1943-1951. https://doi.org/10.1093/cid/cix566. Last accessed June 2018.

63 Monette J, Miller MA, Monette M, et al. Effect of an educational intervention on optimizing antibiotic. prescribing in long-term care facilities. *J Am Geriatr Soc.* 2007;55(8):1231-1235. https://doi.org/10.1111/j.1532-5415.2007.01250.x. Last accessed June 2018.

64 Katz MJ, Gurses AP, Tamma PD, et al. Implementing antimicrobial stewardship in long-term care settings: an integrative review using a human factors approach. *Clin Infect Dis.* 2017;65(11)1943-1951. https://doi.org/10.1093/cid/cix566. Last accessed June 2018.

65 Zimmerman S, Sloane PD, Bertrand R, et al. Successfully reducing antibiotic prescribing in nursing homes. *J Am Geriatr Soc*. 2014:62(5):907-912.

66 Spurling GK, Del Mar CB, Dooley L, et al. Delayed antibiotics for respiratory infections. *Cochrane Database Syst Rev.* 2013;(4):CD004417.

67 Healthcare Research & Educational Trust. AHRQ safety program for long-term care: HAIs/CAUTI website. http://www.hret.org/quality/projects/long-term-care-cauti.shtml. Last accessed June 2018.

68 The Joint Commission. Topic library resources. https://www.jointcommission.org/topics/?k=661. Last accessed June 2018.

69 Burton, T. Why process measures are often more important than outcome measures in healthcare. Slide presentation; December 2014. https://www.slideshare.net/healthcatalyst1/why-process-measures-are-often-more-important-than-outcome-measures-in-healthcare-42485462. Last accessed June 2018.

70 CDC. Appendix B: Measures of Antibiotic Prescribing, Use, and Outcomes. In: *The Core Elements of Antibiotic Stewardship for Nursing Homes.* Atlanta, Georgia: CDC; 2017. https://www.cdc.gov/longtermcare/pdfs/core-elements-antibiotic-stewardship-appendix-b.pdf. Last accessed June 2018.

71 CDC. Appendix B: Measures of Antibiotic Prescribing, Use, and Outcomes. In: *The Core Elements of Antibiotic Stewardship for Nursing Homes.* Atlanta, Georgia: CDC; 2017. https://www.cdc.gov/longtermcare/pdfs/core-elements-antibiotic-stewardship-appendix-b.pdf. Last accessed June 2018.

72 Kruse CS, Mileski M, Vijaykumar AG, et al. Impact of electronic health records on long-term care facilities: systematic review. *JMIR Med Inform*. 2017;5(3);e35. https://doi.org/10.2196/medinform.7958. Last accessed June 2018.

73 The Joint Commission. Approved: new antimicrobial stewardship standard. *Joint Commission Perspectives®*. 2016;36(7):1-8. https://www.jointcommission.org/assets/1/6/New_Antimicrobial_Stewardship_Standard.pdf. Last accessed June 2018.

74 CDC. National Healthcare Safety Network (NHSN) tracking infections in long-term care facilities website. https://www.cdc.gov/nhsn/ltc/index.html. Last accessed June 2018.

APPENDIX A:
Antibiotic Stewardship Strategies In Action

Strategy in Action #1:
Improving Antibiotic Use through Better Assessment and Diagnosis of Urinary Tract Infection (UTI)

Goal:

Increase facility accuracy Care Transitions

Core Element	Strategies
Leadership	• Administrator communicates focus on reducing inappropriate use of antibiotics for treatment of suspected UTI in the facility.
Accountability	• Administrator identifies two team champions with responsibility for assessing and leading initiatives to improve UTI management. • Medical director notifies all prescribers; a letter for new prescribers focuses on reducing inappropriate urinalysis, inaccurate UTI diagnosis, and inappropriate antibiotic use for asymptomatic bacteriuria.
Drug Expertise	• Administrator hires infectious disease and antibiotic expertise or provides training for consultant pharmacists, medical directors, directors of nursing, or infection prevention staff. • Medical director and consultant pharmacist identify consulting relationships with ID physicians or local hospital expertise for periodic consultation and review, and/or support in developing facility protocols and treatment guidelines.
Action	• Antibiotic stewardship team leaders evaluate facility processes from recognition of resident change in condition to resolution of infection for UTI and uses this to define areas for improvement, documentation needs, and roles. • Team members use standard SBAR tools for UTI assessment, communication, and decision making, based on Loeb clinical criteria for antibiotic initiation or the clinical component of the revised McGeer criteria. • Director of nursing and infection prevention leaders document daily antibiotic starts for suspected UTI and review during team huddles to ensure documentation of symptoms, exam findings, testing, and feedback. • Clinical team performs antibiotic time-outs within 72 hours to reassess agent, dose, and duration. • Medical director and consultant pharmacist establish protocols and identify a point person to discuss with a prescriber discontinuation (negative-culture), de-escalation (narrower spectrum agent), or change in duration (shorter length of therapy) based on resident condition and sensitivity data.

Core Element	Strategies
Tracking	• Infection preventionist and director of nursing ensure antibiotic starts are documented in an infection log to facilitate tracking of antibiotic use. • Consultant pharmacist, infection preventionist, and director of nursing ensure antibiotic orders include drug, dose, mode of administration, duration, and indication, which will allow tracking of antibiotic use for UTI. • Director of nursing and infection preventionist conduct concurrent review to identify inappropriate urine testing and inappropriate antibiotic use; and track compliance using SBAR tool for UTI assessment; and tailor frequency of review based on facility size/staff levels.
Reporting	• Team leaders share data being tracked with all stakeholders, including nurses, physician providers, pharmacy, quality improvement committee, and resident and family council, if applicable, to demonstrate progress and inform areas for improvement.
Provider Education	• Antibiotic stewardship team and/or external drug expert provide education and training for nursing staff, prescribing providers, and resident care staff about inappropriate antibiotic use and potential for negative outcomes. • Medical director, director of nursing, and infection preventionist provide ongoing training and daily feedback to nursing staff on resident assessment, documentation, and communication skills. • Medical director and director of nursing provide prompts and scripts to facilitate communication with clinicians by nursing staff and pharmacists. • Director of nursing, consultant pharmacist, and nursing staff provide real-time feedback to prescribers on appropriate antibiotic prescribing, based on facility protocols. Use SBAR communication tools to inform clinical appropriateness. • Medical director uses peer profiling at least annually to educate prescribing clinicians based on facility antibiotic use data and antibiogram data (if applicable). • Medical director offers comparison to other prescribers based on the number of diagnosed UTI cases, proportion of cases meeting facility-defined clinical criteria for initiation of antibiotics, use of specific antimicrobial agents for treatment of UTI, and average length of therapy.
Resident and Family Engagement and Education	• Medical Director, director of nursing, consultant pharmacist and/or external drug expert provide education to residents and families about inappropriate testing and diagnosis of UTI and antibiotic use and potential for negative outcomes and communicate alternatives to antibiotic prescribing such as active monitoring strategies. • Staff provide fact sheets and other educational material to residents and family members at intake and when clinical situation arises. • Consider opportunities to educate residents and families through resident and family council meetings and in care team interactions.

Strategy in Action #2:
Improving Antibiotic Use During Care Transitions

Goal:
Increase accuracy in assessing symptomatic UTI versus asymptomatic bacteriuria.

Core Element	Strategies
Leadership	• Administrator communicates facility commitment to antibiotic stewardship as a patient safety and quality improvement issue in a letter to all referring hospitals and other facilities. Identify improving antibiotic use related to care transitions as a priority for the quality improvement committee in the facility.
Accountability	• Leadership designates responsible staff to oversee the improvement process on care transitions (e.g, director of nursing, infection preventionist), and identifies staff roles for documentation, communication, antibiotic review, and resolution of issues. • Clinical team establishes a relationship with a referring hospital or institution to collaborate on improving antibiotic stewardship practices during care transitions.
Drug Expertise	• Team leaders establish consulting relationships with ID physicians or seek local hospital expertise for support in developing facility protocols and advising on clinical situations.
Action	• Medical director, director of nursing, and infection preventionist assess facility processes for resident transfer (incoming and outgoing), and use assessment to identify gaps in process, define team roles, and define needed data for improvement focus. • Medical director and infection preventionist document and communicate policies related to resident transfer to referring facilities, including required documentation and information on antibiotics and diagnosis of infection, including MDROs. • Antibiotic stewardship team develops or adapts common paper tool for transfer from/to other facilities, including hospitals, including pending tests/cultures, contact information for transferring clinician, medication (including all recently administered antibiotics, both ongoing or discontinued), start date, days of therapy prescribed, indication, dosage, laboratory tests for monitoring, follow-up treatment plan, as well as risk factors, colonization/infection of *C. difficile* and/or multidrug resistant organisms (MDRO), and precautions required. • Designated staff (e.g., consultant pharmacist, IP, MDS coordinator, nurse manager, director of nursing) review transfer form during admission assessment to ensure completeness of medication and infection data for transitioning residents to identify action strategies. • Medical director and director of nursing provide scripts or other standardized communication tools for use by nursing, infection prevention, and pharmacy staff with referring facilities for common situations (e.g., missing information; choice of agent, etc.). • Clinical team performs antibiotic time-outs within 72 hours of resident transfer to reassess agent, dose, and duration.

Core Element	Strategies
Tracking	• Consultant pharmacist, director of nursing, infection preventionist review retrospective data on residents transitioning from acute care or another facility to identify situations for improvement (e.g., frequent use of broader spectrum agents, longer duration of therapy compared to national guidelines, missing indication with antibiotic prescription), and use assessment to define facility protocols. • Consultant pharmacist, medical director, director of nursing, and infection preventionist conduct periodic review to assess changes in process (e.g., completed intake medication reviews; completed transition tool; completeness of data points needed for antibiotic assessment) and outcome measures (e.g., improved communication with referring facilities; number of medication switches required; reduction in days of therapy, number of residents admitted or readmitted from hospitals/ED with antibiotics).
Reporting	• Report process and outcome changes related to care transitions to quality improvement committee, resident/family council, and referring facilities.
Provider Education	• Medical director and consultant pharmacist provide feedback to referring facilities about antibiotic use data and transitions of care data, as well as changes in therapy (e.g., change in dosage or agent, reduced days of therapy, discontinuation). • Facility trains MDS coordinator and designated staff involved in resident transfer on core data elements of antibiotic use for intake medication assessment and facility procedures.
Resident and Family Engagement and Education	• Team leaders communicate policy of reducing inappropriate antibiotic use in the facility and during care transitions to residents and families (e.g., as part of admission agreement, during intake, via welcome letter). • Team leaders educate residents and families about changes in duration, dose, or agent based on assessment and interventions identified during transition review process.

CDC Sample Transfer Forms:

https://www.cdc.gov/hai/pdfs/toolkits/infectioncontroltransferformexample1.pdf

https://www.cdc.gov/hai/pdfs/toolkits/infectioncontroltransferformexample2.pdf

APPENDIX B:
URL Links to Resources

Core Element 1: Leadership Commitment

Resource	Address
Qualis Health. Commitment to the Wise Use of Antibiotics.	http://medicare.qualishealth.org/sites/default/files/medicare.qualishealth.org/AbxCommitment.pdf
Rhode Island Department of Health. Sample Statement of Leadership Commitment for Antibiotic Stewardship.	http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source= web&cd=1&ved=0ahUKEwjF3bqj05nbAhUEmlkHSz CqIQFggsMAA&url= http%3A%2F %2Fwww.healthri.gov% 2Fpublications%2Ftemplates%2FAntimicrobialStewartshipLetterOfSupport.docx&usg=AOvVaw3FtqfumbmZA7ovZT1LElU7
Nebraska Antimicrobial Stewardship Assessment and Promotion Program. Leadership Support Statement Template.	https://asap.nebraskamed.com/long-term-care/tools-templates-long-term-care/
Greater New York Hospital Association United Hospital Fund. Antimicrobial Stewardship Toolkit. Making the Business Case for Antimicrobial Stewardship (p.17).	https://uhfnyc.org/assets/1042
Spellberg B. Bartlett JG, Gilbert DN. How to pitch an antibiotic program to the hospital C-suite. *Open Forum Infect Dis*. 2016;3(4):1-5.	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5104972/
Minnesota Department of Health. Sample Antibiotic Stewardship Policy for Long-Term Care Facilities.	http://www.health.state.mn.us/divs/idepc/dtopics/antibioticresistance/hcp/ltcsamplepolicy.pdf
AHRQ. Nursing Home Antimicrobial Stewardship Guide: Draft Policies & Procedures.	https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/3_TK1_T5-Draft_Policies_and_Procedures_for_the_Antimicrobial_Stewardship_Program_final.pdf
Jump RLP, Gaur S, Katz MJ, et al. Template for antibiotic stewardship policy for post-acute and long-term care settings. *J Am Med Dir Assoc*. 2017; 18(11):913-920.	http://www.jamda.com/article/S1525-8610(17)30430-9/pdf
Nebraska Antimicrobial Stewardship Assessment and Promotion Program. Institutional Policy Template for Long-Term Care.	https://asap.nebraskamed.com/long-term-care/tools-templates-long-term-care/
Colorado Hospital Association. Antimicrobial Stewardship Collaborative Commitment Letter.	http://www.qualityforum.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=82401
Cosgrove, S.E. et al (2014). Guidance for the knowledge and skills required for antimicrobial Stewardship Leaders. *Infect Control Hosp Epidemiol.* 2014;35(12):1444–1451.	https://pdfs.semanticscholar.org/6d55/6d8ce05ba4ef2ca7bcdc3100dea0983c22d5.pdf
Massachusetts Coalition for the Prevention of Medical Errors. Practice Support & Education Tools for Clinicians in LTC: Discovery and Action Handbook.	http://www.macoalition.org/evaluation-and-treatment-uti-in-elderly.shtml#practiceSupport
Pew Charitable Trusts. A Path to Better Antibiotic Stewardship in Inpatient Settings: 10 case studies map how to improve antibiotic use in acute and long-term care facilities.	http://www.pewtrusts.org/en/research-and-analysis/reports/2016/04/a-path-to-better-antibiotic-stewardship-in-inpatient-settings

Resource	Address
National Association of Directors of Nursing Administration in Long Term Care (NADONA). Sample Job Description for Infection Preventionist in Long-Term Care Facilities.	https://www.nadona.org/samples-policies-and-job-description/
CMS Quality, Safety, & Oversight. Guidance to Laws & Regulation Nursing Homes.	https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/GuidanceforLawsAndRegulations/Nursing-Homes.html
New Antimicrobial Stewardship Standard. *Jt Comm Perspect.* 2016;36(7):1-8.	https://www.jointcommission.org/assets/1/6/New_Antimicrobial_Stewardship_Standard.pdf
Jump R, Olds D, Jury L, et al. Specialty care delivery: bringing infectious disease expertise to the residents of a Veterans Affairs long-term care facility. *J Am Geriatr Soc.* 2013;61(5):782-787.	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3656129/
McElligott M, Welham G, Pop-Vicas A, et al. Antibiotic stewardship in nursing facilities. Infect *Dis Clin N Am.* 2017;31:619-638.	https://www.id.theclinics.com/article/S0891-5520(17)30062-4/fulltext
Rahme C, Jacoby J, Avery L. Impact of a hospital's antibiotic stewardship team on fluoroquinolone use at a long-term care facility. *Ann Longterm Care.* 2016;24(6):13-20.	https://www.managedhealthcareconnect.com/article/impact-hospital-s-antibiotic-stewardship-team-fluoroquinolone-use-long-term-care-facility
McMaughan DK, Nwaiwu O, Hongwei Z, et al. Impact of a decision-making aid for suspected urinary tract infections on antibiotic overuse in nursing homes. *BMC Geriatr.* 2016;16:81.	https://bmcgeriatr.biomedcentral.com/articles/10.1186/s12877-016-0255-9
Doernberg SB, Dudas V, Trivedi KK. Implementation of an antimicrobial stewardship program targeting residents with urinary tract infections in three community long-term care facilities: a quasi-experimental study using time-series analysis. *Antimicrob Resist Infect Control*. 2015;4:54.	http://www.aricjournal.com/content/4/1/54
Manning ML, Septimus EJ, Doss ES, et al. Antimicrobial stewardship and infection preventions—leveraging the synergy. A position paper update. *Am J Infect Control.* 2018;46(4):364-368.	https://www.ajicjournal.org/article/S0196-6553(18)30001-4/fulltext
AMDA. Antibiotic Stewardship Policy for Post-Acute and Long-Term Care Settings.	https://paltc.org/publications/antibiotic-stewardship-policy-post-acute-and-long-term-care-settings
ASCP/SIDP. The Essential Role of Pharmacists in Antibiotic Stewardship Programs in Long Term Care Facilities.	http://www.ascp.com/policy-asp
SHEA Policy Statement on Antimicrobial Stewardship	https://www.shea-online.org/index.php/practice-resources/priority-topics/antimicrobial-stewardship/shea-policy-statement
Moody J, Cosgrove SE, Olmsted R. et al. Antimicrobial stewardship: A collaborative partnership between infection preventionists and health care epidemiologists. *Am J Infec Control.* 2012;40(2):94-5.	https://apic.org/Resource_/TinyMceFileManager/Practice_Guidance/APIC_SHEA_Antimicrobial_Stewardship_Position_Statement.pdf

Resource	Address
APIC. The APIC Policy Agenda: Antibiotic Stewardship.	http://www.apic.org/Resource_/TinyMceFileManager/Government_Affairs/APIC_Public_Policy_Agenda_-_Antibiotic_Stewardship.pdf
University of Rochester Nursing Home Collaborative	http://www.rochesterpatientsafety.com/index.cfm?Page=For%20Nursing%20Homes
Example antimicrobial order form	http://www.rochesterpatientsafety.com/Images_Content/Site1/Files/Pages/Nursing Homes/HAB Abx order form.pdf

Core Element 2: Accountability

Resource	Address
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Suggested Agenda for an Antimicrobial Stewardship Program Team Meeting.	https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/3_TK2_T1-Suggested_Agenda_for_Meeting_on_Monitoring_Final.pdf
Colorado Department of Public Health and Environment. Antimicrobial Stewardship Assessment Tool for Long-Term Care Facilities: Sample Letter.	https://www.cohca.org/wp-content/uploads/sites/170/2018/01/LTCF_Assessment_Description_121817.pdf
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Roles and Responsibilities for Antimicrobial Stewardship.	https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/3_TK1_T2-Roles_and_Responsibilities_final.pdf
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Start an Antimicrobial Stewardship Program.	https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/3_TK1_T1-Gather_a_Team_final.pdf
National Nursing Home Quality Care. Collaborative Change Package.	http://qioprogram.org/system/files_force/resources/documents/C2_Change_Package_20170511_508.pdf
Greater New York Hospital Association United Hospital Fund. Antimicrobial Stewardship Toolkit.	https://uhfnyc.org/assets/1042
Minnesota Department of Health. Antimicrobial Stewardship Gap Analysis Tool.	http://www.health.state.mn.us/divs/idepc/dtopics/antibioticresistance/hcp/asp/ltc/apxc.pdf
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Readiness Assessment.	https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/3_TK1_T3-Readiness_Assessment_final.pdf
Nebraska Antimicrobial Stewardship Assessment and Promotion Program (ASAP). Extended assessment instrument for long-term care facilities.	https://asap.nebraskamed.com/long-term-care/tools-templates-long-term-care/
CDC. The Core Elements of Antibiotic Stewardship in Nursing Homes Checklist.	https://www.cdc.gov/longtermcare/pdfs/core-elements-antibiotic-stewardship-checklist.pdf
Qualis Health. Checklist on Core Elements of Antibiotic Stewardship in Nursing Homes	http://medicare.qualishealth.org/sites/default/files/medicare.qualishealth.org/Core%20ElementsAdapted.pdf
Washington State Department of Health. EQuIP for Long-Term Care Facilities Participation Agreement.	https://www.doh.wa.gov/Portals/1/Documents/5000/EQuIPLTCWAParticipantAgreementAndEnrollmentForm.docx
Minnesota Department of Health. Antibiotic Stewardship Honor Rolls	http://www.health.state.mn.us/onehealthabx/honor/index.html

Core Element 3: Drug Expertise

Resource	Address
SHEA. Policy Statement Antimicrobial Stewardship.	https://www.shea-online.org/index.php/practice-resources/priority-topics/antimicrobial-stewardship/shea-policy-statement
Bentley D, Bradley S, High K, et al. Practice guideline for evaluation of fever and infection in long-term care facilities. *J AM Geriatr Soc*. 2001;49(2):210-222.	https://doi.org/10.1046/j.1532-5415.2001.49999.x
McDonald LC, Gerding DN, Johnson S, et al. Clinical practice guidelines for Clostridium difficile infection in adults and children: 2017 update by IDSA and SHEA. *Clin Infect Dis.* 2018; 7(19):e1-e48.	https://academic.oup.com/cid/article/66/7/e1/4855916
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Suspected UTI SBAR Toolkit.	http://www.ahrq.gov/nhguide/toolkits/determine-whether-to-treat/toolkit1-suspected-uti-sbar.html
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Working With Your Lab to Improve Antibiotic Prescribing.	http://www.ahrq.gov/nhguide/toolkits/help-clinicians-choose-the-right-antibiotic/toolkit1-working-with-a-lab.html
AHRQ. 12 Common Nursing Home Situations and Infection Control Guidelines for MRSA, C. Difficile, and VRE Pocket Cards.	https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/4_TK2_T2-Antibiotic_Pocket_Cards.pdf
University Health System. Pocket Guide for Antibiotic Pharmacotherapy by Class.	https://www.universityhealthsystem.com/~/media/files/clinical-pathways/antibiotic-pocket-guide-15.pdf?la=en
Minnesota Hospital Association. Act Fast: Early Detection of Sepsis Quick Guide.	https://www.mnhospitals.org/Portals/0/Documents/ptsafety/SeeingSepsisLTC/5.%20Seeing%20Sepsis%20-%20ACT%20FAST%20-%20for%20LTC.pdf
Nebraska Antimicrobial Stewardship Assessment and Promotion Program. Revised McGeer Criteria for Infection Surveillance Checklist.	https://asap.nebraskamed.com/long-term-care/tools-templates-long-term-care/
ASCP. Antimicrobial Stewardship in LTPAC.	http://www.ascp.com/?page=asp
SIDP/ASCP Long-Term Care Antimicrobial Stewardship Certificate Program.	https://www.sidp.org/LTCStewardship
Banks R, Viau R, Wilson B, et al. At a rural Veterans Affairs medical center, telehealth decreased antibiotic use in long-term, but not acute care. *Open Forum Infect Dis.* 2017;4(S1):S275.	https://doi.org/10.1093/ofid/ofx163.613
Doyle, K. Infectious Disease Patients May Benefit from Telemedicine. Managed Healthcare Connect. January 1, 2015.	https://www.managedhealthcareconnect.com/articles/infectious-disease-patients-may-benefit-telemedicine
Perla RJ, Provost LP, Murray SK. The run chart: a simple analytical tool for learning from variation in healthcare processes. *BMJ Qual Saf.* 2011;20(1):46-51.	http://qualitysafety.bmj.com/content/20/1/46
Diamond Pharmacy	http://www.diamondpharmacy.com/

Core Element 4: Action

Resource	Address
Nebraska Antimicrobial Stewardship Assessment and Promotion Program. Antimicrobial Stewardship Self-Assessment Instrument for Long-Term Care Facilities.	https://asap.nebraskamed.com/wp-content/uploads/sites/3/2018/02/ASAP-LTCF-self-assessment-instrument-Jan-2018.pdf
National Nursing Home Quality Improvement Campaign. Assessment of Current CDI Prevention Activities Antibiotic Stewardship.	https://www.nhqualitycampaign.org/files/AntibioticStewardship_Assessment.pdf
Minnesota Department of Health Antimicrobial Stewardship Program Toolkit for Long-Term Care Facilities: Antimicrobial Use Assessment for Long-Term Care Facilities.	http://www.health.state.mn.us/divs/idepc/dtopics/antibioticresistance/hcp/asp/ltc/apxe.pdf
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Minimum Criteria for Antibiotics Tool.	http://www.ahrq.gov/nhguide/toolkits/determine-whether-to-treat/antibiotic-tool.html
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Suspected UTI SBAR Toolkit.	http://www.ahrq.gov/nhguide/toolkits/determine-whether-to-treat/toolkit1-suspected-uti-sbar.html
Minnesota Department of Health. Antimicrobial Stewardship Program Toolkit for Long-Term Care Facilities: Nursing Process Evaluation Tool Resident Change in Condition.	http://www.health.state.mn.us/divs/idepc/dtopics/antibioticresistance/hcp/asp/ltc/apxe.pdf
National Nursing Home Quality Improvement Campaign. CMS Critical Elements Pathways.	https://www.nhqualitycampaign.org/goalDetail.aspx?g=inf#tab4
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Minimum Criteria for Antibiotics Tool.	http://www.ahrq.gov/nhguide/toolkits/determine-whether-to-treat/antibiotic-tool.html
AHRQ. Nursing Home Antimicrobial Stewardship Guide. SBAR Templates: Suspected Urinary Tract Infection Suspected Lower Respiratory Infection Suspected Skin and Soft Tissue Infection	https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/4_TK1_T1-SBAR_UTI_Final.pdf https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/4_TK3_T2b-SBAR_LRI_Final.pdf https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/4_TK3_T2c-SBAR_SST_Final.pdf
Massachusetts Coalition for the Prevention of Medical Errors. ABCs for Diagnosing Urinary Tract Infection in Long Term Care.	http://www.macoalition.org/Initiatives/infections/uti_2013/tools/UTI Protocol_final.pdf
AHRQ Nursing Home Antimicrobial Stewardship Guide. Medical Care Referral Form.	https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/4_TK2_T1-Medical_Care_Referral_Form.pdf
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Letter to Prescribing Clinicians on the Protocol for Three Common Infections.	https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/4_TK3_T4-Letter_to_Prescribing_Clinicians.pdf
CDC. Sample Inter-facility Infection Control Transfer Form: Example 1 Example 2	https://www.cdc.gov/hai/pdfs/toolkits/InfectionControlTransferFormExample1.pdf https://www.cdc.gov/hai/pdfs/toolkits/InfectionControlTransferFormExample2.pdf
Colorado Department of Public Health and Environment. Antimicrobial Stewardship Assessment Tool for Long-Term Care Facilities: Sample Letter	https://www.cohca.org/wp-content/uploads/sites/170/2018/01/LTCF_Assessment_Description_121817.pdf
University of Nebraska Medical Center. General Shift Change Report.	https://www.unmc.edu/patient-safety/_documents/sbar-shift-change-report-generic.doc

Resource	Address
Fisch J, McNamara S., Lansing B et al. The 24-hour report as an effective monitoring and communication tool in infection prevention and control in nursing homes. *Am J Infect Control.* 2014;42(10):1112-1114.	https://doi.org/10.1016/j.ajic.2014.07.001
AHRQ. Nursing Home Antimicrobial Guide. 12 Common Nursing Home Situations and Infection Control Guidelines for MRSA, C. Difficile, and VRE Pocket Cards.	https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/4_TK2_T2-Antibiotic_Pocket_Cards.pdf
Massachusetts Infection Prevention Partnership. Treating Asymptomatic Bacteriuria: All Harm, No Benefit.	http://www.macoalition.org/Initiatives/infections/uti_2013/tools/LTC_Clinician Education Sheet_final.pdf
Nebraska Antimicrobial Stewardship Assessment and Promotion Program: Tools and Templates for Long-Term Care.	https://asap.nebraskamed.com/long-term-care/tools-templates-long-term-care/
National Nursing Home Quality Improvement Campaign Toolkit.	https://www.nhqualitycampaign.org/goalDetail.aspx?g=inf#tab1
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Readiness Assessment.	https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/3_TK1_T3-Readiness_Assessment_final.pdf
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Working With Your Lab to Improve Antibiotic Prescribing.	http://www.ahrq.gov/nhguide/toolkits/help-clinicians-choose-the-right-antibiotic/toolkit1-working-with-a-lab.html
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Monitor and Sustain Stewardship Toolkit.	https://www.ahrq.gov/nhguide/toolkits/implement-monitor-sustain-program/toolkit2-monitor-sustain-program.html
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Minimum Criteria for Common Infections Toolkit.	http://www.ahrq.gov/nhguide/toolkits/determine-whether-to-treat/toolkit3-minimum-criteria.html
Michigan Antibiotic Resistance Reduction Coalition. Long-term Care Toolkit.	http://www.mi-marr.org/LTC_toolkit.php
Minnesota Department of Health. Antimicrobial Use Assessment.	http://www.health.state.mn.us/divs/idepc/dtopics/antibioticresistance/hcp/asp/ltc/apxe.pdf
Washington State Department of Health. JumpStart Stewardship: Implementing Antimicrobial Stewardship in Nursing Homes.	https://www.doh.wa.gov/Portals/1/Documents/5000/420-Non-DOH-JumpStartStewardshipNursingHomes.pdf
Minnesota Department of Health. Minnesota Antimicrobial Stewardship Program Toolkit for Long-Term Care Facilities.	http://www.health.state.mn.us/divs/idepc/dtopics/antibioticresistance/hcp/asp/ltc/index.html
Stone ND, Ashraf MS, Calder J, et al. Surveillance definitions of infections in long-term care facilities: revisiting the McGeer criteria. *Infect Control Hosp Epidemiol.* 2012;3(10): 965-977.	http://www.jstor.org/stable/10.1086/667743
AHRQ Minimum Criteria for Antibiotics Tools	https://www.ahrq.gov/nhguide/toolkits/determine-whether-to-treat/antibiotic-tool.html
INTERACT® Guidance on Identification and Management of Infections	www.pathway-interact.com/wp-content/uploads/2017/11/INTERACT-guidance-on-infections-updated-November-7-2017.pdf

Core Element 5: Tracking

Resource	Address
Measure Your Success: Monitoring and Tracking Data. New England Quality Innovation Network.	http://www.healthcarefornewengland.org/event/webinar-measure-your-success-monitoring-and-tracking-data/
Antibiotic Stewardship Measurement Framework. Centers for Disease Control and Prevention.	https://www.cdc.gov/antibiotic-use/healthcare/pdfs/Antibiotic_Stewardship_Measurement_Framework.pdf
AHRQ Toolkit 2: Monitor and Sustain Stewardship. Antibiotic Use Tracking Sheet, Monthly or Quarterly Prescribing Profile.	https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/3_TK2_T4-Quarterly_or_Monthly_Prescribing_Profile_Final.pdf
Infections Tracking Tool from the National Nursing Home Quality Improvement Campaign.	https://www.nhqualitycampaign.org/goalDetail.aspx?g=inf#tab2
Rochester Nursing Home Collaborative: Antibiotic Tracking Tools and Instruction Sheet.	http://www.rochesterpatientsafety.com/index.cfm?Page=For%20Nursing%20Homes%22
The Nebraska Antimicrobial Stewardship Assessment and Promotion Program (ASAP). Antibiotic Stewardship in Nursing Homes: Tools and Templates.	https://asap.nebraskamed.com/long-term-care/tools-templates-long-term-care/
Qualis Health Infections Tracking Tool.	http://medicare.qualishealth.org/projects/nursing-home-quality-care-collaborative/selected-clinical-resources/infection-prevention
Massachusetts Coalition for the Prevention of Medical Errors. Sample Data Collection Workbook: Long Term Care Run Charts.	http://www.macoalition.org/Initiatives/infections/uti_2013/tools/2013_2014_LTC_Data_Submission_Spreadsheet.xls
AHRQ. Methodological Challenges Associated With Developing and Implementing Antibiograms in Nursing Homes.	https://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/advances-in-hai/hai-article9.html
AHRQ Toolkit 1. Working With a Lab to Improve Antibiotic Prescribing.	https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/5_TK1_T6-Sample_Distribution_Plan_for_an_Antibiogram_final.pdf
AHRQ. Toolkit 2. Using Nursing Home Antibiograms to Choose the Right Antibiotic	https://www.ahrq.gov/nhguide/toolkits/help-clinicians-choose-the-right-antibiotic/toolkit2-concise-antibiogram-toolkit.html
Nebraska Antimicrobial Stewardship Assessment and Promotion Program: Antibiogram Template.	https://asap.nebraskamed.com/long-term-care/tools-templates-long-term-care/
AHRQ. Methodological Challenges Associated With Developing and Implementing Antibiograms in Nursing Homes.	https://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/advances-in-hai/hai-article9.html

Core Element 6: Reporting Information on Improving Antibiotic Use

Resource	Address
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Sample Quarterly or Monthly Prescribing Profile.	https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/3_TK2_T4-Quarterly_or_Monthly_Prescribing_Profile_Final.docx
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Sample Monthly Reports.	https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/3_TK2_T3-Sample_Monthly_Summary_Reports_Final.pdf
Nebraska Antimicrobial Stewardship Assessment and Promotion Program. Quarterly Antibiotic Use Summary Report Template.	https://asap.nebraskamed.com/wp-content/uploads/sites/3/2018/04/Antibiotic-use-summary-report-template.docx
Massachusetts Coalition for the Prevention of Medical Errors. Sample Data Collection Workbook: Long Term Care Run Charts.	http://www.macoalition.org/Initiatives/infections/uti_2013/tools/2013_2014_LTC_Data_Submission_Spreadsheet.xls
Qualis Health. Nursing Home Antibiotic Stewardship Checklist.	http://medicare.qualishealth.org/projects/nursing-home-quality-care-collaborative/selected-clinical-resources/infection-prevention
Dumyati G & Felsen C. A Multidisciplinary Approach to Antibiotic Stewardship: Gathering and Using Data. Web Presentation.	http://www.rochesterpatientsafety.com/Images_Content/Site1/Files/Pages/Nursing%20Homes/Gathering%20and%20Using%20Nursing%20Home%20Antibiotic%20Data.pdf
National Nursing Home Improvement Campaign. Storyboard Guide for Performance Improvement Projects.	https://www.nhqualitycampaign.org/goalDetail.aspx?g=inf#tab5
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Monitor & Sustain Stewardship.	https://www.ahrq.gov/nhguide/toolkits/implement-monitor-sustain-program/toolkit2-monitor-sustain-program.html
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Common Suspected Infections: Communication and Decision making for Four Infections.	https://www.ahrq.gov/nhguide/toolkits/determine-whether-to-treat/toolkit2-communications-and-decisionmaking.html
INTERACT® Version 4.0 Tools for Nursing Homes.	http://www.pathway-interact.com/interact-tools/interact-tools-library/interact-version-4-0-tools-for-nursing-homes/
CMS. QAPI Plan-Do-Study-Act Cycle Worksheet.	https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/QAPI/downloads/PDSACycledebedits.pdf

Core Element 7: Provider Education

Resource	Address
Nebraska Antimicrobial Stewardship Assessment and Promotion Program (ASAP)	https://asap.nebraskamed.com/about/
AHRQ Health TV YouTube. Antibiotic Stewardship in Nursing Homes: How You Can Prevent Antibiotic Resistance.	https://youtube.com/watch?v=qvr61rM8XMM
CMS. Quality Improvement Organizations. Nursing Home Training Sessions in Antibiotic Stewardship.	http://qioprogram.org/antibiotic-stewardship
CMS. Quality Improvement Organizations. Webinars. Antibiotic Stewardship.	http://www.healthcarefornewengland.org/providers/ltc-webinars/#nhquality
Nebraska Antimicrobial Stewardship Assessment and Promotion Program. Video Series on Antimicrobial Stewardship in LTCF.	https://asap.nebraskamed.com/long-term-care/educational-materials-long-term-care/
Washington State Department of Health. EQuIP for Long-Term Care Facilities (LTC). Recorded Webinars.	https://www.doh.wa.gov/YouandYourFamily/IllnessandDisease/HealthcareAssociatedInfections/EQuIP/LongTermCare
Nebraska Antimicrobial Stewardship Assessment and Promotion Program. Utilizing Already Available Tools for Antimicrobial Stewardship Implementation in Post-Acute and Long-Term Care Facilities. Webinar by Dr. M. Salman Ashraf.	https://www.youtube.com/watch?v=sgen5hVXtmE
CDC. Fact Sheet for Residents and Families: What You Need to Know About Antibiotics in a Nursing Home.	https://www.cdc.gov/longtermcare/pdfs/factsheet-core-elements-what-you-need-to-know.pdf
National Nursing Home Quality Improvement Campaign. Infections Fact Sheets.	https://www.nhqualitycampaign.org/goalDetail.aspx?g=inf#tab5
AHRQ. 12 Common Nursing Home Situations and Infection Control Guidelines for MRSA, C. Difficile, and VRE Pocket Cards.	https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/4_TK2_T2-Antibiotic_Pocket_Cards.pdf
Arizona Department of Health Services. Breaking the Cycle: Asymptomatic Bacteriuria Pocket Card.	http://www.azdhs.gov/documents/preparedness/epidemiology-disease-control/healthcare-associated-infection/advisory-committee/antimicrobial-stewardship/asb-pocketcard.pdf
Scottish Antimicrobial Prescribing Group. Decision Aid for Care Home Staff to Support Management of People with Diarrhoea.	https://www.scottishmedicines.org.uk/files/sapg/Care_home_decision_aid__web_.pdf
Scottish Antimicrobial Prescribing Group. Decision Aid for Diagnosis and Management of Suspected Urinary Tract Infection (UTI) in Older People.	https://www.sapg.scot/media/2917/decision_aid_for_uti_in_older_people.pdf
Alberta Health Services. Antimicrobial Stewardship Backgrounder: Aspiration Pneumonitis vs. Pneumonia.	https://www.albertahealthservices.ca/assets/info/hp/as/if-hp-asb-2017-04-issue-13.pdf
Massachusetts Infection Prevention Partnership: Suspect a Urinary Tract Infection? How Taking Antibiotics When You Don't Need Them Can Cause More Harm Than Good.	http://www.macoalition.org/Initiatives/infections/uti_2013/Antibiotic brochure V10 8.5x11.pdf

Resource	Address
Minnesota Department of Health. Antimicrobial Stewardship Program Toolkit for Long-term Care Facilities. Nursing and Provider Antibiotic Use Attitudes and Beliefs Surveys.	http://www.health.state.mn.us/divs/idepc/dtopics/antibioticresistance/hcp/asp/ltc/apxd.pdf
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Minimum Criteria for Common Infections Toolkit.	http://www.ahrq.gov/nhguide/toolkits/determine-whether-to-treat/toolkit3-minimum-criteria.html
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Common Suspected Infections: Communication and Decision making for Four Infections.	http://www.ahrq.gov/nhguide/toolkits/determine-whether-to-treat/toolkit2-communications-and-decisionmaking.html
Massachusetts Coalition for the Prevention of Medical Errors. Improving Evaluation of UTI in the Elderly.	http://www.macoalition.org/evaluation-and-treatment-uti-in-elderly.shtml
Michigan Antibiotic Resistance Reduction Coalition. Long-Term Care Toolkit.	http://www.mi-marr.org/LTC_toolkit.php
Nursing Home Quality Campaign. Implementing Change in Long-Term-Care: A practical Guide to Transformation.	https://www.nhqualitycampaign.org/files/Implementation_Manual_Part_1_Attachments_1_and_2.pdf
Mody L, Greene M, Meddings J et al. A national implementation project to prevent catheter-associated urinary tract infection in nursing home residents. *JAMA Intern Med*. 2017;177(8):1154-1162.	https://doi.org/10.1001/jamainternmed.2017.1689
CDC TRAIN. CDC Training on Antibiotic Stewardship. Section 1.	https://www.train.org/cdctrain/course/1075730/compilation
COURSEsites. Improving the Care of Long-Term Care Facility Residents with Infections.	https://www.coursesites.com/webapps/Bb-sites-course-creation-BBLEARN/courseHomepage.htmlx?course_id=_348931_1
Nebraska Infection Control Network. Primary Infection Prevention Course Long-Term Care.	http://www.nicn.org/
CMS & CDC. Specialized Infection Prevention and Control Training for Nursing Home Staff in the Long-Term Care Setting.	https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertificationGenInfo/Policy-and-Memos-to-States-and-Regions-Items/QSO18-15-NH.html?DLPage=2&DLEntries=10&DLSort=3&DLSortDir=descending
SIDP/ASCP. Antimicrobial Stewardship. A Long-Term Care Certificate Program for Pharmacists.	https://www.sidp.org/LTCStewardship
APIC EPI for Long-Term Care Education Series Online.	https://apic.org/Education-and-Events/Online-learning
American Association of Post-Acute Care Nursing (AADNS): Antibiotic Stewardship Program in Long-Term Care Virtual Workshop	https://www.aadns-ltc.org/Education/Antibiotic-Stewardship
The National Association of Directors of Nursing Administration in Long-Term Care (NADONA) Antibiotic Stewardship Certificate of Mastery (ASCOM™)/Antibiotic Stewardship Specialist Certification (AS-BC™).	https://www.nadona.org/ip-bc-program-2/

Core Element 8: Resident and Family Engagement and Education

Resource	Address
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Managing Resident and Family Expectations.	https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/6_TK1_T6-Managing_Resident_and_Family_Expectations_Final.pdf
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Talking with Residents. Short Version Long Version	https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/6_TK1_T1-Talking_with_Residents_checklist_version_Final.pdf
University of Rochester Nursing Home Collaborative. Asymptomatic Bacteriuria Family Letter. Monroe Community Hospital.	http://www.rochesterpatientsafety.com/Images_Content/Site1/Files/Pages/Nursing Homes/Asymptomatic-Bacteriuria-Family-Letter.pdf
Rochester Nursing Home Collaborative. Active Monitoring Verbal Communication Guide and Documentation Form.	http://www.rochesterpatientsafety.com/Images_Content/Site1/Files/Pages/Nursing Homes/Active Monitoring Pocket Card.pdf
CDC. Antibiotics Related Fact Sheets.	https://www.cdc.gov/antibiotic-use/community/materials-references/print-materials/everyone/index.html
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Be Smart about Antibiotics: Prevent Hospital Acquired Infections Handout.	https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/6_TK1_T4-Be_Smart_About_Antibiotics_Final.pdf
AHRQ. Nursing Home Antimicrobial Stewardship Guide: Resident Information Sheet Antibiotic-Resistant Bacteria.	https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/6_TK1_T3-Resident_Information_Sheet_Antibiotic-Resistant_Bacteria_Final.pdf
Nebraska Antimicrobial Stewardship Assessment and Promotion Program. Roadmap for Sensible Antibiotic Use.	https://asap.nebraskamed.com/wp-content/uploads/sites/3/2017/07/Patient-Educational-Leaflet-Roadmap-to-sensible-antibiotic-use.pdf
Massachusetts Coalition for the Prevention of Medical Errors. When Do You Need An Antibiotic?	http://www.macoalition.org/Initiatives/infections/uti_2013/tools/LTC_brochure_final.pdf
Rochester Nursing Home Collaborative. Antibiotics for UTI in Older Adults Fact Sheet.	http://www.rochesterpatientsafety.com/Images_Content/Site1/Files/Pages/Nursing Homes/Antibiotics for UTI in Older Adults.pdf
Massachusetts Infection Prevention Partnership. Suspect a Urinary Tract Infection? How Taking Antibiotics When You Don't Need Them Can Cause More Harm Than Good.	http://www.macoalition.org/Initiatives/infections/uti_2013/Antibiotic brochure V10.pdf
SHEA. For Our Patients and Their Visitors: Help Prevent Infections Fact Sheet.	http://www.shea-online.org/images/patients/healthcare_associated_infections_patient_guide.pdf
CDC. Be Antibiotics Aware: Stakeholder Toolkit.	http://www.cdc.gov/antibiotic-use
AHRQ. Nursing Home Antimicrobial Stewardship Guide. Educate and Engage Residents and Family Members.	http://www.ahrq.gov/nhguide/toolkits/educate-and-engage/index.html
Partnering to Prevent Catheter-Associated Urinary Tract Infections (CAUTI): HRET and the CAUTI-LTC Program.	https://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/cauti-ltc/index.html

Resource	Address
AHRQ Health TV YouTube. Antibiotic Stewardship in Nursing Homes: How You Can Prevent Antibiotic Resistance.	https://www.youtube.com/watch?v=qvr61rM8XMM
New York State Department of Health YouTube. Educating Patients about Antibiotic Usage.	https://www.youtube.com/watch?v=YHYmb2OKoMU

Other

Resource	Address
The Joint Commission Nursing Care Center Accreditation	https://www.jointcommission.org/accreditation/long_term_care.aspx
National Healthcare Safety Network (NHSN)	https://www.cdc.gov/nhsn/ltc/index.html
The Improving Medicare Post-Acute Care Transformation (IMPACT) Act	https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Post-Acute-Care-Quality-Initiatives/IMPACT-Act-of-2014/IMPACT-Act-of-2014-Data-Standardization-and-Cross-Setting-Measures.html
Minimum Data Set	https://www.cms.gov/Research-Statistics-Data-and-Systems/Computer-Data-and-Systems/MinimumDataSets20/index.html

APPENDIX C:
Acronyms

AHA
American Hospital Association

AHRQ
Agency for Healthcare Research and Quality

APIC
Association of Professionals in Infection Control and Epidemiology

ASCP
American Society of Consultant Pharmacists

ASP
Antibiotic stewardship program

CAUTI
Catheter-associated urinary tract infection

CDC
Centers for Disease Control and Prevention

CDI
Clostridium difficile infection, *C. difficile*

CMS
Centers for Medicare and Medicaid Services

CNA
Certified Nursing Assistant

CP
Consultant pharmacist

DON
Director of nursing

DOT
Days of therapy

EHR
Electronic health record

EMR
Electronic medical record

HAI
Healthcare-associated infection

IDP
Infectious disease physician

IDSA
Infectious Disease Society of America

IMPACT
Improving Medicare Post-Acute Care Transformation

IP
Infection preventionist

IPC
Infection prevention and control

IPCO
Infection prevention and control officer

IPCP
Infection prevention and control program

LTCF
Long-term care facility

MDH
Minnesota Department of Health

MDRO
Multidrug-resistant organisms

MDS
Multiple Data Set

MOU
Memorandum of understanding

MRSA
Methicillin-resistant *Staphylococcus aureus*

MUE
Medication use evaluation

NHSN
National Health Safety Network

NNHQI
National Nursing Home Quality Improvement Campaign

NP
Nurse practitioner

NQF
National Quality Forum

NQP
National Quality Partners

ONC
Office of National Coordinator for Health Information Technology

PNA
Pneumonia

QAA
Quality assessment and assurance

QAPI
Quality assurance and performance improvement

QI
Quality improvement

QIO
Quality improvement organization

RAP
Resident assessment protocols

SBAR
Situation, background, assessment, recommendation

SHEA
Society for Healthcare Epidemiology of America

SIDP
Society of Infectious Diseases Pharmacists

SSTI
Skin and soft tissue infection

TJC
The Joint Commission

UDA
User defined assessment

UTI
Urinary tract infection

VRE
Vancomycin-resistant enterococci

NQF STAFF

Kathleen Giblin, Senior Vice President

Wendy Prins, Senior Advisor

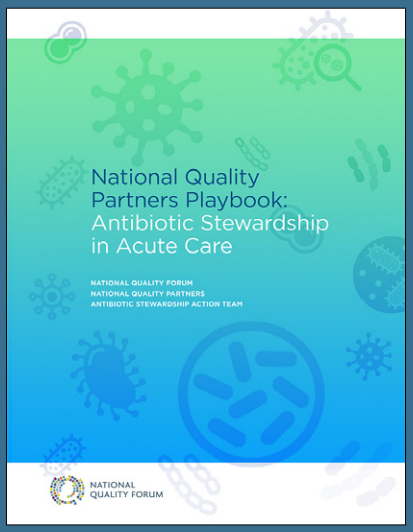
Rachel Roiland, Director

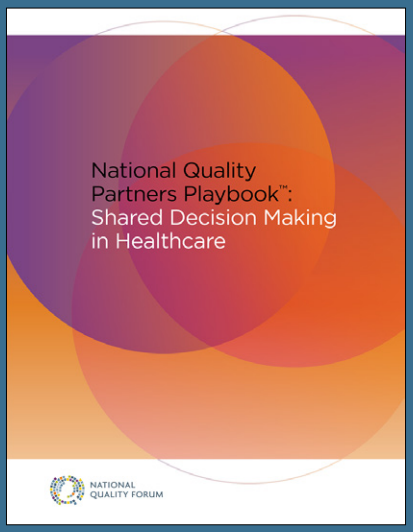
Kavitha Nallathambi, Director

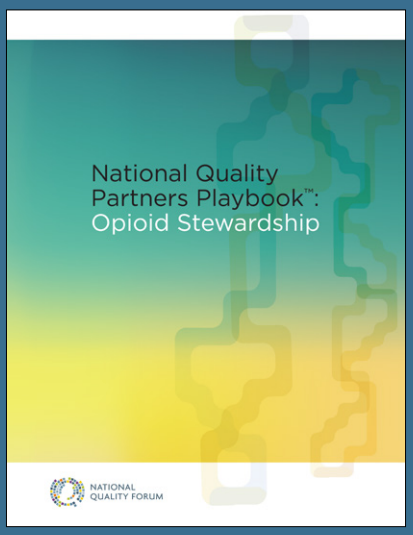
Danitza Valdivia, Administrative Manager

ISBN 978-1-68248-083-0

Other Available NQP Playbooks™







NATIONAL QUALITY FORUM
1030 15TH STREET, NW, SUITE 800
WASHINGTON, DC 20005
www.qualityforum.org