



# A Field Guide to Antibiotic Stewardship in Outpatient Settings

July 2018



**Quality Improvement  
Organizations**

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CENTERS FOR MEDICARE & MEDICAID SERVICES

*This material was prepared by Alliant Quality, the quality improvement group of Alliant Health Solutions (AHS), the Medicare Quality Innovation Network - Quality Improvement Organization for Alabama, Florida, Georgia, Kentucky, Louisiana, North Carolina, and Tennessee, under contract with the Centers for Medicare & Medicaid Services (CMS), an agency of the U.S. Department of Health and Human Services. The contents presented do not necessarily reflect CMS policy.  
Publication No.12SOW-AHSQIN-QIO-TO1NH-20-62*



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## Introduction

Antibiotic Stewardship (AS) is a coordinated program that promotes the appropriate use of antimicrobials to improve patient outcomes, reduce microbial resistance, and decrease the spread of multi-drug resistant organisms.<sup>1</sup> In clinical settings, stewardship activities focus on measuring and improving how antibiotics are prescribed by clinicians and used by patients. Improving antibiotic prescribing involves implementing effective strategies to modify prescribing practices to align them with evidence-based recommendations for diagnosis and management.

Promoting effective stewardship is especially important in outpatient settings, as the majority of U.S. antibiotic expenditures for humans are related to care received outside of hospitals and other institutions.<sup>2</sup> To address this need, the Centers for Disease Control and Prevention (CDC) released the Core Elements of Outpatient Antibiotic Stewardship<sup>3</sup> in November 2016 as a guiding framework for establishing effective antibiotic stewardship programs in outpatient clinical care delivery facilities that routinely provide antibiotic treatment. The Centers for Medicare & Medicaid Services (CMS) included promotion of and support for outpatient antibiotic stewardship as a priority task for the Quality Innovation Network-Quality Improvement Organizations (QIN-QIOs) in the 11<sup>th</sup> Statement of Work.

QIN-QIOs work with a variety of outpatient settings to measure and improve antibiotic prescribing in order to promote the health of Medicare beneficiaries and all patients through ensuring that they reliably receive the right drug at the right dose for the right duration. The Core Elements serve as a structured approach for QIN-QIOs to use with outpatient settings to achieve these goals. Outpatient settings targeted by the QIN-QIOs include physician offices, outpatient pharmacies and clinics, emergency departments, urgent care clinics, and Federally Qualified Health Centers (FQHCs). At the time of this report, QIN-QIOs have assisted more than 7,500 outpatient facilities in developing and implementing antibiotic stewardship plans.

## Information Source for this Guide

A required part of the QIN-QIO work is to submit quarterly narrative reports describing the outpatient facilities with which they are working, the progress of each towards successful achievement of core element implementation, and challenges and mitigating strategies tested. This Field Guide summarizes successful strategies identified in these narrative reports during the first nine months of work.

## How to Use this Guide

This Field Guide is intended for use by outpatient healthcare providers and leaders interested in implementing the Core Elements of Outpatient Antibiotic Stewardship in their organizations. This Guide provides a collection of concrete implementation strategies, suggestions, and tools designed, tested, and applied by QIN-QIOs working with a variety of outpatient settings to implement the Core Elements.

Although the CDC provides the Core Elements as minimum activities needed for antibiotic stewardship in outpatient settings, the elements need not be addressed sequentially. Having a multi-disciplinary team, including facility leadership, conduct a gap-analysis of current antibiotic stewardship practices and weaknesses is beneficial in advance of attempting to accomplish these Core Elements. Gap analysis tools are provided in the overarching resources in *Appendix A*.

This Guide is intended to be complementary to literature reviews and other evidence-based tools and resources (see *Appendix A* for a selection of these resources). In addition, *Appendix B* includes a list of acronyms.

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<sup>1</sup>Association for Professionals in Infection Control and Epidemiology. Antimicrobial Stewardship. Accessed on July 7, 2018. <https://apic.org/Professional-Practice/Practice-Resources/Antimicrobial-Stewardship>.

<sup>2</sup>Shehab N, et al. Clin Infect Dis 2008;47:735–43. Gonzales R et al. Clin Infect Dis 2001;33:757–62. Suda et al. J Antimicrob Chemother 2013; 68: 715–718

<sup>3</sup>Sanchez GV, Fleming-Dutra KE, Roberts RM, Hicks LA. Core Elements of Outpatient Antibiotic Stewardship. MMWR Recomm Rep 2016;65 (No. RR-6):1–12.

## Structure of Guide

To accompany the Core Elements of Outpatient Antibiotic Stewardship, the CDC provides a checklist of recommended activities outpatient clinicians and facilities can take to implement antibiotic stewardship. The checklist can be used as a baseline assessment of existing compliance with the Core Elements and can be used to track progress in expanding stewardship activities.

The implementation strategies provided in this Guide are organized by Core Element, then further categorized by each item in the CDC's checklist.

## Acknowledgments

The Quality Innovation Network National Coordinating Center (QIN NCC) developed this Field Guide in conjunction with the CMS, CDC, and the QIN-QIOs (listed below). We would like to thank all for their recommendations, ideas, and support.



## Overview of the Core Elements of Outpatient Antibiotic Stewardship



**Commitment:** demonstrated dedication to and accountability for optimizing antibiotic prescribing and patient safety



**Action for policy and practice:** implement at least one policy or practice to improve antibiotic prescribing, assess whether it is working, and modify as needed



**Tracking and reporting:** monitor antibiotic prescribing practices and offer regular feedback to clinicians or have clinicians assess their own antibiotic use



**Education and expertise:** provide educational resources to clinicians and patients on antibiotic prescribing and ensure access to needed expertise on antibiotic prescribing

<https://www.cdc.gov/getsmart/community/improving-prescribing/core-elements/core-outpatient-stewardship.html>

## Core Element 1: Leadership Commitment



*Can your facility demonstrate dedication to and accountability for optimizing antibiotic prescribing and patient safety related to antibiotics?<sup>4</sup>*



CDC Recommended Intervention

### Write and display public commitments in support of antibiotic stewardship.



Resources & Examples

- Joint **commitment poster**, developed by Health Quality Innovators QIN and State Department of Health ([http://www.hqi.solutions/wp-content/uploads/2017/09/Safe-use-of-antibiotic\\_MD\\_flyer\\_FINAL2\\_071717.pdf](http://www.hqi.solutions/wp-content/uploads/2017/09/Safe-use-of-antibiotic_MD_flyer_FINAL2_071717.pdf))
- **Commitment poster**, developed by the CDC and adapted with input from New England QIN patient and family advisory council ([http://www.healthcarefornewengland.org/wp-content/uploads/CommitPoster\\_090717\\_Letter-pdf-image.jpg](http://www.healthcarefornewengland.org/wp-content/uploads/CommitPoster_090717_Letter-pdf-image.jpg))
- “Do you need antibiotics?” **poster**, developed by the CDC ([https://www.cdc.gov/antibiotic-use/community/pdfs/aaw/AU\\_Wait\\_Room\\_Poster\\_508.pdf](https://www.cdc.gov/antibiotic-use/community/pdfs/aaw/AU_Wait_Room_Poster_508.pdf))
- **Multi-language commitment poster** examples, developed by Qualis Health; available in English, Korean, Russian, Spanish, and Vietnamese; website offers customizable options and two available sizes (<http://medicare.qualishealth.org/projects/AMS-in-Outpatient-Settings/Selected-Resources>)
- **Commitment poster**, developed by the CDC (<https://www.cdc.gov/antibiotic-use/community/downloads/A-Commitment-to-Our-Patients-about-Antibiotics-poster-version-1.pdf>)



Implementation Strategies Recommended by QIN-QIOs

- ☐ Create a commitment poster to display in waiting rooms and patient care areas, particularly exam rooms.
  - ☐ Place national campaign patient education materials in patient care areas and waiting rooms.
  - ☐ Use waiting room videos that educate patients on antibiotic stewardship, antimicrobial resistance, and the potential harms of antibiotics (videos are available in Core Element 4: Education and Expertise section).
  - ☐ Dedicate areas of the patient portal and facility website to antibiotic stewardship information and education that can be accessed prior to scheduled appointments.
  - ☐ Consider partnering with State Departments of Health, medical associations, boards, academic institutions, quality improvement organizations, and statewide initiatives on the design and co-branding of commitment posters and other materials to raise public awareness and acceptance that antibiotic resistance is a pressing public health concern.
- Consider multiple language options for communicating antibiotic stewardship commitment, dependent on your community and patient population.

<sup>4</sup> Sanchez GV, Fleming-Dutra KE, Roberts RM, Hicks LA. Core Elements of Outpatient Antibiotic Stewardship. MMWR Recomm Rep 2016;65 (No. RR-6):1–12.



## Core Element 1: Leadership Commitment



CDC Recommended  
Intervention

**Identify a single leader to direct antibiotic stewardship activities within facility.**



Resources  
&  
Examples

- Outpatient Antibiotic Stewardship **Sample Policies**, developed by Telligen QIN (<https://telligenqinio.com/resource/outpatient-antibiotic-stewardship-sample-policies/>)



Implementation  
Strategies  
Recommended by  
QIN-QIOs

- Create a formal agreement that identifies an administrative leader and a clinical setting champion. Both actors must sign the agreement demonstrating commitment to directing and promoting the initiative. This official designation establishes organizational commitment and solidifies personal commitment.
  - The administrative leader may be a senior administrator or a unit/department leader and is responsible for setting and communicating the overall vision for antibiotic stewardship within the organization, making decisions related to implementation, and holding others accountable for following through on process or practice changes. They serve as the official point of contact for the initiative.
  - Staff champions, depending on the provider setting, can be physicians, physician assistants, advanced practice registered nurses, nurses, or pharmacists. They will have direct contact with clinical staff and other staff and can help message the rationale for changes in practices, help with defining new processes, and elevate significant concerns or barriers to leadership for further discussion and decision-making.
  - The designated clinical champion should have authority to commit staff time and resources to the initiative and should be familiar with the needs of the setting in order to identify resources necessary for successful implementation of the initiative.
- An important part of a program is providing structure to maintain visible leadership; antimicrobial stewardship roles and responsibilities should be incorporated into multiple leadership positions to ensure sustainability despite turn-over and prevent program collapse due to loss of a single “champion.”



## Core Element 1: Leadership Commitment



CDC Recommended  
Intervention

**Include antibiotic stewardship-related duties in position descriptions or job evaluation criteria.**



Resources  
&  
Examples

- Antibiotic stewardship **roles and responsibilities** that can be incorporated into position descriptions or job evaluation criteria, developed by Telligen QIN (<https://telligenqinqio.com/resource/outpatient-antibiotic-stewardship-roles-responsibilities/>)



Implementation  
Strategies  
Recommended by  
QIN-QIOs

- Modify job descriptions to incorporate antibiotic stewardship roles and responsibilities.
  - Tying positions with antibiotic stewardship duties will ease new employee transitions and limit disruption to implementation.





## Core Element 1: Leadership Commitment



CDC Recommended  
Intervention

**Communicate with all clinic staff to set patient expectations.**



Resources  
&  
Examples

- **On-demand video** on the Commitment Core Element includes strategies for demonstrating commitment of antibiotic stewardship, developed by Lake Superior QIN (7:34 minutes) (<https://www.youtube.com/watch?v=IjqBF7T7dJU>)
- A collection of **templates and sample policy documents** that can be adapted for your organization, developed by Telligen QIN (<https://telligenqinqio.com/resource/outpatient-antibiotic-stewardship-sample-policies/>)



Implementation  
Strategies  
Recommended by  
QIN-QIOs

- Educate all staff, including administrative and clinical care teams, on the importance of antibiotic stewardship, its priority in the organization, and its benefit to patients.
    - This inclusive approach will affirm organizational commitment and ensure consistent staff messaging to patients on antibiotic expectations. Staff champions may also help with ensuring messages are repeated consistently and often.
  - Set up mandatory staff training on antibiotic stewardship and patient communication about antibiotic treatment and resistance.
    - Consider implementing lunch and learn meetings with staff or integrating antibiotic stewardship into staff learning management software.
  - Create an internal multidisciplinary committee to collaborate on antibiotic stewardship work, since logistic decisions and implementation activities often impact many roles within the outpatient setting.
    - A diverse set of skills and authority should be represented on your committee, including but not limited to multiple physician specialties, nursing, pharmacy, information technology, electronic health records experts, infection control, possible study design expertise (i.e., quality improvement), and risk-management.
- The IT team plays a significant role in implementing a successful tracking program for antibiotic prescribing and can inform the initiative of tracking and reporting capabilities for their facility.
- Demonstrate organizational commitment by establishing written policies on antibiotic stewardship.

## Core Element 2: Action



*Has your facility implemented at least one policy or practice to improve antibiotic prescribing?<sup>5</sup>*



**CDC Recommended Intervention**

### **Use evidence-based diagnostic criteria and treatment recommendations.**



**Resources & Examples**

- **Practice guidelines** for judicious use of antibiotics for common upper-respiratory infections, developed by the Washington State Department of Health (Acute Otitis Media; Bronchitis; Acute Uncomplicated Sinusitis in Adults and Children; Pharyngitis) <https://www.doh.wa.gov/YouandYourFamily/IllnessandDisease/HealthcareAssociatedInfections/EQulP/AmbulatoryCare>
- **Guidelines** on some common outpatient conditions, developed by the CDC (<https://www.cdc.gov/antibiotic-use/community/for-hcp/outpatient-hcp/index.html>)
- **Skin and Soft Tissue Treatment Algorithm**, developed by IDSA ([http://atlanticquality.org/download/outpatient-antibiotic-tewardship/508\\_IDSA-Skin-and-Soft-Tissue-Infection-Algorithm-7-18-17.pdf](http://atlanticquality.org/download/outpatient-antibiotic-tewardship/508_IDSA-Skin-and-Soft-Tissue-Infection-Algorithm-7-18-17.pdf))
- **Cellulitis Pocket Guide**, developed by Atlantic Quality QIN ([http://atlanticquality.org/download/outpatient-antibiotic-tewardship/508\\_AQIN3-TskC3-Cellulitis-PocketGuide\\_v5a-AQIN3.pdf](http://atlanticquality.org/download/outpatient-antibiotic-tewardship/508_AQIN3-TskC3-Cellulitis-PocketGuide_v5a-AQIN3.pdf))
- YouTube **video** to inform healthcare providers in all outpatient settings on the importance of using good judgment to prescribe antibiotics, developed by the CDC (55:08 minutes) (<https://www.youtube.com/watch?v=A0fe2pz-5vE>)



**Implementation Strategies Recommended by QIN-QIOs**

- Antibiotic stewardship teams and clinical experts review current clinical practice guidelines for common outpatient infectious diseases and implement these guidelines into their practice, taking local antibiotic resistance patterns into account (if available).
- Provide copies of updated/standardized guidelines and corresponding treatment recommendations to all prescribers.
- Start or join a local antibiotic stewardship task force, coalition, or committee where providers and stakeholders can collaborate to share and/or develop evidence-based tools for implementing policy treatment recommendations and policies.
  - Statewide and community-based initiatives increase buy-in and commitment to antibiotic stewardship practices.
  - o Work with the community-based initiative to develop a community antibiogram.

<sup>5</sup> Sanchez GV, Fleming-Dutra KE, Roberts RM, Hicks LA. Core Elements of Outpatient Antibiotic Stewardship. MMWR Recomm Rep 2016;65(No. RR-6):1–12.



## Core Element 2: Action



CDC Recommended  
Intervention

**Use delayed prescribing practices or watchful waiting, when appropriate.**



Resources  
&  
Examples

- **Prescription sheet** for providers to tell patients their diagnosis, suggested instructions, recommended over-the-counter medications, and plan for follow-up, developed by the CDC ([https://www.cdc.gov/antibiotic-use/community/pdfs/aaw/CDC-AU\\_RCx\\_Relief\\_for\\_Viral\\_Illness\\_sm\\_v8\\_508.pdf](https://www.cdc.gov/antibiotic-use/community/pdfs/aaw/CDC-AU_RCx_Relief_for_Viral_Illness_sm_v8_508.pdf))
- **Viral Prescription Pad** (prescription pad for use by providers in managing viral symptoms) scripts are printed in 5 1/2" x 8 1/2" pads of 50, developed by Great Plains QIN (<http://greatplainsqin.org/wp-content/uploads/2017/10/Rx-Pad-ABS.pdf>)



Implementation  
Strategies  
Recommended by  
QIN-QIOs

- ☐ Use prescription pads and symptom relief pads for viral diagnoses as treatment and patient education tools at the time of the visit.
- ☐ Incorporate documentation of delayed prescribing and watchful waiting practices into the Electronic Health Record (EHR).



## Core Element 2: Action



CDC Recommended  
Intervention

### Provide communications skills training for clinicians.



Resources  
&  
Examples

- **Training** in Motivational Interviewing (<https://www.umassmed.edu/cipc/motivational-interviewing/overview/>)
- Provider-facing **communication tip sheet**, developed by New England QIN ([http://www.healthcarefornewengland.org/wp-content/uploads/C3-10\\_TalkingPts\\_Final.pdf](http://www.healthcarefornewengland.org/wp-content/uploads/C3-10_TalkingPts_Final.pdf)).
- How to Prescribe Fewer Unnecessary Antibiotics: **Talking Points** That Work with Patients and Their Families (<http://www.aafp.org/afp/2016/0801/p200.html>)
- Dialogue Around Respiratory Illness Treatment (DART) **communication videos**, developed by Dr. Rita Mangione-Smith and team at Seattle Children's Hospital (<http://www.seattlechildrens.org/research/child-health-behavior-and-development/mangione-smith-lab/dart-learning-modules/>)
  - o Continuing education credits are available for these videos as part of CDC Training on Antibiotic Stewardship (<https://www.train.org/cdctrain/course/1075730>)



Implementation  
Strategies Recommended  
by QIN-QIOs

- ☐ Provide prescriber education on physician-patient communication skills and strategies for explaining why an antibiotic prescription is not being given or why it is being delayed.



CDC Recommended  
Intervention

### Require explicit written justification in the medical record for non-recommended antibiotic prescribing.



Resources  
&  
Examples

- This on-demand **video** highlights action to policy and procedure as a Core Element and provides examples of how an organization can demonstrate this Element is met, developed by Lake Superior QIN (8:48 minutes) (<https://www.youtube.com/watch?v=xM1ktHGMoEM&feature=youtu.be>)



Implementation  
Strategies Recommended  
by QIN-QIOs

- ☐ Build a mechanism in the EHR to require documentation when exceptions from the organization's antibiogram or deviations from prescribing guidelines occur.
- ☐ When an electronic health record isn't available, document exceptions to non-recommended prescribing in the medical record.
- ☐ When available and appropriate, use rapid diagnostic tests to inform prescribing.



## Core Element 2: Action



CDC Recommended  
Intervention

**Provide support for clinical decisions.**



Resources  
&  
Examples

- No QIN-generated resources identified



Implementation  
Strategies Recommended  
by QIN-QIOs

- ☐ Incorporate evidence-based guidelines into Electronic Health Record (EHR) order sets.
  - To encourage avoidance of antibiotics when not indicated
  - To guide targeted selection of antibiotics in situations requiring antibiotic treatment



CDC Recommended  
Intervention

**Use call centers, nurse hotlines, or pharmacist consultations as  
triage systems to prevent unnecessary visits.**



Resources  
&  
Examples

- No QIN-generated resources identified



Implementation  
Strategies Recommended  
by QIN-QIOs

- ☐ No QIN-generated strategies identified

## Core Element 3: Tracking and Reporting



*Does your facility monitor at least one aspect of antibiotic prescribing?<sup>6</sup>*



**CDC Recommended  
Intervention**

### **Self-evaluate antibiotic prescribing practices.**

(This intervention only applies to solo practitioners or practices with fewer than five clinicians, as long as all clinicians participate.)



**Resources  
&  
Examples**

- **Bronchitis self-audit tool** (this worksheet can help your providers quantify opportunities to improve antibiotic prescribing for this condition), developed by the QIN NCC in conjunction with CDC ([https://qioprogram.org/sites/default/files/editors/141/Bronchitis\\_Self-Audit\\_20170825\\_FNLv2\\_508.pdf](https://qioprogram.org/sites/default/files/editors/141/Bronchitis_Self-Audit_20170825_FNLv2_508.pdf))
- **Viral URI self-audit tool** (this worksheet can help your providers quantify opportunities to improve antibiotic prescribing for this condition), developed by the QIN NCC in conjunction with CDC ([https://qioprogram.org/sites/default/files/editors/141/Viral\\_URI\\_Self-Audit\\_20171024\\_FNLv3\\_508.pdf](https://qioprogram.org/sites/default/files/editors/141/Viral_URI_Self-Audit_20171024_FNLv3_508.pdf))



**Implementation  
Strategies Recommended  
by QIN-QIOs**

- Pull baseline data prior to initiating interventions and small tests of change so the impact can be assessed.
  - Pick a baseline from the same calendar period since priority diagnoses are often seasonal.

<sup>6</sup> Sanchez GV, Fleming-Dutra KE, Roberts RM, Hicks LA. Core Elements of Outpatient Antibiotic Stewardship. MMWR Recomm Rep 2016;65(No. RR-6):1–12.



## Core Element 3: Tracking and Reporting



CDC Recommended  
Intervention

**Participate in continuing medical education and quality improvement activities to track and improve antibiotic prescribing.** (This intervention only applies if all clinicians in the practice participate in the activity.)



Resources  
&  
Examples

- Antimicrobial Stewardship **tracking and audit tool** (Microsoft Excel) that aligns with 2018 QPP MIPS Measures, developed by Qualis Health ([http://medicare.qualishealth.org/sites/default/files/medicare.qualishealth.org/2018\\_04\\_03\\_AMS\\_MIPS\\_Tracking\\_Tool\\_1\\_0.xlsm](http://medicare.qualishealth.org/sites/default/files/medicare.qualishealth.org/2018_04_03_AMS_MIPS_Tracking_Tool_1_0.xlsm))
- Outpatient Antibiotic Stewardship **Clinical Quality Measure Guidebook**, developed by Telligen QIN (<https://telligenqinqio.com/resource/outpatient-antibiotic-stewardship-clinical-quality-measure-guidebook/>)



Implementation  
Strategies Recommended  
by QIN-QIOs

- Align internal antibiotic stewardship tracking practices with reporting requirements and payment models or health plan incentive programs for the antibiotic assessment. See resources section for crosswalks between antibiotic prescribing and quality payment programs.
  - This will consolidate resources and staff time and ease reporting since new EHR functionality does not need to be developed.
  - This can also provide financial incentives for implementing antibiotic stewardship, leading to increased organizational commitment.



## Core Element 3: Tracking and Reporting



CDC Recommended  
Intervention

**Track and report antibiotic prescribing for one or more high priority conditions.**



Resources  
&  
Examples

- Acute Uncomplicated **Bronchitis Record Review** (Adult) this record review tool was developed to assist in determining a bronchitis diagnosis. This evaluation should focus on ruling out the diagnosis of pneumonia, which is rare in healthy patients, in the absence of normal vital signs, developed by TMF QIN ([https://www.tmfqin.org/Portals/0/Resource%20Center/Antibiotic%20Stewardship/PI\\_Bronchitis\\_508.pdf](https://www.tmfqin.org/Portals/0/Resource%20Center/Antibiotic%20Stewardship/PI_Bronchitis_508.pdf))
- Antimicrobial Stewardship **tracking and audit tool** (Microsoft Excel) that assesses **upper-respiratory infection** prescribing that aligns with IDSA guidelines, developed by Qualis Health ([http://medicare.qualishealth.org/sites/default/files/medicare.qualishealth.org/20180404\\_AMSURI\\_Audit\\_Tool\\_1\\_0\\_Download.xlsx](http://medicare.qualishealth.org/sites/default/files/medicare.qualishealth.org/20180404_AMSURI_Audit_Tool_1_0_Download.xlsx))
- **Bronchitis tracking tool** for investigating appropriateness of prescribing, developed by Alliant Quality QIN ([http://www.alliantquality.org/sites/default/files/Bronchitis%20Tracking%20Tool%2011SOW-GMCFQIN-C310-18-04\\_0\\_0.pdf](http://www.alliantquality.org/sites/default/files/Bronchitis%20Tracking%20Tool%2011SOW-GMCFQIN-C310-18-04_0_0.pdf))
- **Sinusitis tracking tool** for investigating appropriateness of prescribing, developed by Alliant Quality QIN ([http://www.alliantquality.org/sites/default/files/Sinusitis%20Tracking%20Tool\\_11SOW-GMCFQIN-C310-18-02%20%282%29\\_0.pdf](http://www.alliantquality.org/sites/default/files/Sinusitis%20Tracking%20Tool_11SOW-GMCFQIN-C310-18-02%20%282%29_0.pdf))
- **Pharyngitis tracking tool**, for investigating appropriateness of prescribing, developed by Alliant Quality QIN ([http://www.alliantquality.org/sites/default/files/Pharyngitis%20Tracking%20Tool%2011SOW-GMCFQIN-C310-18-03\\_0.pdf](http://www.alliantquality.org/sites/default/files/Pharyngitis%20Tracking%20Tool%2011SOW-GMCFQIN-C310-18-03_0.pdf))



Implementation  
Strategies Recommended  
by QIN-QIOs

- ☐ Track antibiotics prescribed that potentially were not needed.
  - Bronchitis, acute sinusitis, other (or all) upper-respiratory conditions.
  - Many of these diagnoses are viral in origin. Tracking these conditions and those that result in an antibiotic prescription constitutes following one or more high priority diagnoses.
- ☐ Track drug class being prescribed for appropriateness based on diagnosis indication (e.g., targeting reducing the use of fluoroquinolones for uncomplicated UTI when another agent would be recommended first-line).





## Core Element 3: Tracking and Reporting



CDC Recommended Intervention

**Track and report the percentage of all visits leading to antibiotic prescriptions.**



Resources & Examples

- This **data collection tool** has been developed to assist in tracking appropriate antibiotic prescribing for a particular illness and reviewing tracked data graphically, over time, developed by TMF QIN (<https://www.tmfqin.org/Portals/0/Resource%20Center/Antibiotic%20Stewardship/Prescribing%20Practices%20Data%20Collection%20Tool-FINAL.xlsx>)



Implementation Strategies Recommended by QIN-QIOs

- ☐ Track overall prescribing rate and/or separate by antibiotic class.
- ☐ Review antibiotic drug class being prescribed for appropriateness based on diagnosis indication (e.g., use of fluoroquinolones in uncomplicated UTI).
- ☐ Track antibiotic adverse drug events (ADEs).
  - Tracking antibiotic adverse drug events (ADEs) raises awareness about the risks of antibiotic use to patient safety and motivates action and commitment to antibiotic stewardship programs.
- ☐ Use random sampling and manual chart abstraction to review prescribing rates and patterns for settings lacking IT capacity to pull relevant reports from EHRs.



CDC Recommended Intervention

**(If already tracking and reporting one of the above) Track and report, at the level of a healthcare system, complications of antibiotic use and antibiotic resistance trends among common outpatient bacterial pathogens.**



Resources & Examples

- No QIN-generated resources identified



Implementation Strategies Recommended by QIN-QIOs

- ☐ Develop or seek out prescribing measures where provider antibiotic prescribing rates can be compared with peers in the same facility, network, or region.
  - Comparing prescriber reports can help motivate behavior change at the provider level.
- ☐ Track antibiotic complications and resistance trends across network-affiliated settings.
- ☐ Aggregate antibiotic prescribing reports by diagnosis across healthcare systems and/or community coalitions.
  - This can be compared to nation, state, or other organizations working on antibiotic prescribing initiatives (CDC provides national prescribing rate reports).
- ☐ Work with local departments of health and other state professional entities to obtain state level comparative/benchmarking reports or county level antibiotic prescribing patterns outlined by high-priority conditions.
- ☐ Work with local departments of health and other state professional entities to determine community acquired *Clostridium difficile* infection (CDI) rates, as a supplemental measure of antibiotic prescribing change.
  - Identify areas based on drug and its level of risk for development of CDI to target interventions.
  - Prioritize limiting drugs that increase risk for CDI (i.e., fluoroquinolones).



## Core Element 3: Tracking and Reporting



CDC Recommended  
Intervention

**Assess and share performance on quality measures and established reduction goals addressing appropriate antibiotic prescribing from healthcare plans and payers.**



Resources  
&  
Examples

- No QIN-generated resources identified



Implementation  
Strategies Recommended  
by QIN-QIOs

- Conduct random audits to assess whether appropriate diagnostic criteria are being met and whether the prescribed antibiotic was appropriate (correct agent, dose, and duration). Use chart audit tools to make these determinations.
- Review data quarterly or bi-annually to identify trends and patterns to inform implementation effectiveness and/or the level of provider engagement.
- Create case review tools that can be used to track prescribing rates for conditions in which antibiotics are not necessary, and provide them to recruited clinical settings to encourage and ease tracking.
- Develop provider scorecards and other quality improvement (QI) tools to assess antibiotic stewardship program successes and illuminate opportunities for improvement.

## Core Element 4: Education and Expertise



*Does your facility provide resources to clinicians and patients on evidence-based antibiotic prescribing?<sup>7</sup>*



CDC Recommended Intervention

**Use effective communications strategies to educate patients about when antibiotics are and are not needed.**



Resources & Examples

- **Viral prescription pad** sample (prescription pad for use by providers in managing viral symptoms) scripts are printed in 5 ½" x 8 ½" pads of 50, developed by Great Plains QIN (<http://greatplainsqin.org/wp-content/uploads/2017/10/Rx-Pad-ABS.pdf>)
- **Symptom relief for viral illnesses** (prescription sheet for providers to tell patients their diagnosis, suggested instructions, recommended over-the-counter medications, and plan for follow-up), developed by CDC ([https://www.cdc.gov/antibiotic-use/community/pdfs/aaw/CDC-AU\\_RCx\\_Relief\\_for\\_Viral\\_Illness\\_sm\\_v8\\_508.pdf](https://www.cdc.gov/antibiotic-use/community/pdfs/aaw/CDC-AU_RCx_Relief_for_Viral_Illness_sm_v8_508.pdf))
- **Video: Educating Patients** about Antibiotic Use, developed by New York State Department of Health (7:40 minutes) (<https://www.youtube.com/watch?v=YHYmb2OKoMU>)
- **Video on shared decision-making** for acute respiratory illness, developed by the Veterans Affairs (13:33 minutes) (<https://www.youtube.com/watch?v=Qa-B0zXsmBk&feature=youtu.be>)
- **Dialogue Around Respiratory Illness Treatment (DART) communication videos**, developed by Dr. Rita Mangione-Smith and team at Seattle Children's Hospital (<http://www.seattlechildrens.org/research/child-health-behavior-and-development/mangione-smith-lab/dart-learning-modules/>)



Implementation Strategies Recommended by QIN-QIOs

- Integrate prescription pad for viral diagnosis into clinician processes.
  - Viral prescription pads will indicate diagnosis, the reason antibiotic is not being prescribed, and general instructions for symptom relief, specific medicines, and follow up instructions (see resources section for sample prescription pads).
- Convene a patient and family advisory council to inform development and refinement of patient education resources, workflow, and implementation processes.
- Educate clinicians on communication strategies to manage patient expectations and avoid unnecessary antibiotic prescribing.
- Educate yourself and staff on motivational interviewing techniques to work through possible conflict and uncertainty.

<sup>7</sup> Sanchez GV, Fleming-Dutra KE, Roberts RM, Hicks LA. Core Elements of Antibiotic Stewardship. MMWR Recomm Rep 2016;65 (No. RR-6):1-12



## Core Element 4: Education and Expertise



CDC Recommended  
Intervention

### Educate about the potential harms of antibiotic treatment.



Resources  
&  
Examples

- **Tri-fold pamphlet** explaining the basics of when antibiotics are and are not needed, what the side effects are, and basic infection prevention strategies translated into Spanish, developed by New England QIN ([http://www.healthcarefornewengland.org/wp-content/uploads/AU-trifold-8.5x11\\_v18Spanish.pdf](http://www.healthcarefornewengland.org/wp-content/uploads/AU-trifold-8.5x11_v18Spanish.pdf))
- Patient Education **Waiting Room Video** (this interactive video in quiz format teaches patients important information about antibiotics. When they are not needed, antibiotics won't help you, and the side effects could still hurt you. Learn what antibiotics treat and what they do not treat.) ([https://qioprogram.org/sites/default/files/editors/141/AS\\_Presentation\\_Video\\_Music\\_20180207.mp4](https://qioprogram.org/sites/default/files/editors/141/AS_Presentation_Video_Music_20180207.mp4))
- Antibiotics in our Time: A Global Challenge (this is a YouTube **video** showing the antibiotic resistance crisis and why antibiotic stewardship is so crucial in order to save our antibiotics for future generations), developed by HQI QIN (<https://www.youtube.com/watch?v=klfKPYM452s>)
- Antibiotics: The Right Tool for the Right Problem (three-minute **video** for patient/family audience on ABC's for antibiotics: Ask, Bacteria not virus, Comply with directions), developed by QualityInsights QIN (<https://www.youtube.com/watch?v=iLitefsTHTA&feature=youtu.be>)



Implementation  
Strategies  
Recommended by  
QIN-QIOs

- ☐ Develop a dedicated webpage on the organization's website for patients and family resources.
  - Patients informed about the harms of inappropriate antibiotic treatment may reduce requests for prescriptions, while maintaining patient satisfaction with the care received.
- ☐ Publicly display commitment posters in exam rooms and waiting rooms to generate conversations between patients and providers.
  - Consider combining a commitment poster with patient education information.
- ☐ Use patient portal platforms and electronically generate post visit information from EMR/EHR systems to educate patients on antibiotic treatment and associated risk.



## Core Element 4: Education and Expertise



CDC Recommended  
Intervention

### Provide patient education materials.



Resources  
&  
Examples

- Patient education **handout** describing basic strategies for patients to deal with their viral illness, also available in Spanish, developed by New England QIN ([http://www.healthcarefornewengland.org/wp-content/uploads/C3-10\\_SymptomRelief\\_Final.pdf](http://www.healthcarefornewengland.org/wp-content/uploads/C3-10_SymptomRelief_Final.pdf))
- Viruses or Bacteria: What's got you sick? (a **one-page flyer** educating patients on the causative agent of their sickness and if antibiotics will be helpful or not), developed by CDC (<https://www.cdc.gov/antibiotic-use/community/pdfs/Viruses-or-Bacteria-Factsheet-Eng.pdf>)
- ABC's of Antibiotics **Poster**, developed by APIC (<http://professionals.site.apic.org/infographic/abcs-of-antibiotics/>)
- Antibiotics: Do You Really Need Them? (a **two-page patient education document**), developed by QualityInsights QINs (<https://www.qualityinsights-qin.org/CMSPages/GetFile.aspx?guid=a38eb7e6-5c02-4d69-bde1-f3040d8c6b4c>)
- How to Feel Better **patient teaching sheet** that can be used to address signs and symptoms of viral infection with both over-the-counter medication as well as non-medication methods, developed by Lake Superior QIN ([https://www.lsqin.org/wp-content/uploads/2018/01/C.3.10\\_Feel\\_better\\_flyer\\_112017.pdf](https://www.lsqin.org/wp-content/uploads/2018/01/C.3.10_Feel_better_flyer_112017.pdf))
- When should I use an antibiotic? **Waiting room videos** on antibiotics (available in English, Spanish, and Creole (coming soon)), developed by Health Services Advisory Group (<https://www.youtube.com/playlist?list=PLfm1t1zOVVIMvxtMUCx0z-pBwB8Qe1ap9>)



Implementation  
Strategies  
Recommended by  
QIN-QIOs

- ☐ Provide educational materials and resources to patients. Look for resources from national campaigns, state, and local health departments and other antibiotic stewardship initiatives that can be utilized in the provider setting at the time of visit and post visit.
  - Topics to cover can include antibiotic therapy, disease specific information, symptom relief, harms of inappropriate antibiotic use including adverse drug events (ADEs), resistance and the public health threat, and *Clostridium difficile* infection (CDI).
- ☐ Use patient waiting time to educate. Slide decks and waiting room videos can be played on a loop for patients to review.
- ☐ Share information with patients through pamphlets, posters, letters, emails, advertising, signage, and face-to-face discussion.



## Core Element 4: Education and Expertise



CDC Recommended  
Intervention

**Provide face-to-face educational training (academic detailing).**



Resources  
&  
Examples

- **Fluoroquinolone Fact Sheet** (provider education on adverse events and FDA warning), developed by Atlantic Quality QIN (<http://atlanticquality.org/initiatives/antibiotic-stewardship/edu-expertise/>)
- Antibiotic stewardship: The Family Practitioner's role **article** ([http://www.mdedge.com/sites/default/files/JFP06512876\\_0.PDF](http://www.mdedge.com/sites/default/files/JFP06512876_0.PDF))
- YouTube **video** to inform healthcare providers in all outpatient settings on the importance of using good judgment to prescribe antibiotics, developed by CDC (<https://www.youtube.com/watch?v=A0fe2pz-5vE>)
- Elsevier's Office of Continuing Medical Education, **online CME course** "Addressing the Urgent Threat: Strategies for Combating Hard-To-Treat Bacterial Infections" (<http://learn.elseviercme.com/715e?kbmRecipientKyCd=K65071749&keyCode=981554>)



Implementation  
Strategies  
Recommended by  
QIN-QIOs

- Provide clinician-patient communication training on effective ways of explaining delayed prescribing (watchful waiting) and why an antibiotic is being prescribed or not prescribed for specific diagnoses (see resources section for a CDC training course including strategies).
  - This will help alleviate provider concerns about not prescribing antibiotics having a negative impact on patient satisfaction.
- Review electronic staff education modules to ensure antibiotic education incorporates the risks as well as benefits of antibiotics.
- Educate all staff on antibiotic stewardship.
  - Provide educational outreach during the launch or initiative roll out so the staff is up to speed and familiar with the steps being taken to implement practice level change.
  - Educating all staff on antibiotic stewardship will help achieve consistent messaging to patients.



## Core Element 4: Education and Expertise



CDC Recommended  
Intervention

**Provide continuing education activities for clinicians.**



Resources  
&  
Examples

- **CDC Training** on Antibiotic Stewardship (fulfills Improvement Activities Patient Safety and Practice Assessment as part of MIPS program); CE credits offered (<https://www.train.org/cdctrain/course/1075730>)
- Stanford University **online CME course** “To Prescribe or not to Prescribe? Antibiotics and Outpatient Infections” (<https://vptl.stanford.edu/prescribe-or-not-prescribe-antibiotics-and-outpatient-infections>)



Implementation  
Strategies  
Recommended by  
QIN-QIOs

- Capitalize on continuing medical education (CME) credit opportunities and on-demand education modules for prescriber education.



## Core Element 4: Education and Expertise



CDC Recommended  
Intervention

**Ensure timely access to persons with expertise.**



Resources  
&  
Examples

- No QIN-generated resources identified



Implementation  
Strategies  
Recommended by  
QIN-QIOs

- ☐ Collaborate on the development of educational materials and tools with other organizations committed to antibiotic stewardship including State Departments of Health, medical associations, boards, academic institutions, and statewide initiatives.
  - This partnership will allow for the sharing of best practices, resources, and expertise and the discussion of effective strategies and solutions to implementation challenges.
  - Co-developed patient education posters are one example of a resource that could be developed collaboratively and will strengthen the commitment for antibiotic stewardship.
- ☐ Access educational sessions and webinars provided by state and local agencies (e.g., Departments of Health) or other health collaborative organizations and partnerships (e.g., Project ECHO).
- ☐ Use collaborations with larger health systems to facilitate timely access to experts in antibiotic stewardship and infectious disease (ID), if available.
- ☐ Partner with and invite infectious disease (ID) physicians and ID pharmacists to practices to conduct training sessions for medical staff.
- ☐ Attend professional meetings to receive face-to-face education.
- ☐ Participate in virtual education opportunities conducted by subject matter experts.
- ☐ Schedule network calls between other providers from similar settings to share effective strategies and barriers to antibiotic stewardship.



## Potential Barriers & Suggested Solutions

Each core element for outpatient settings presents different challenges. Additionally, barriers vary by type of setting (e.g., emergency department, primary care practice, pharmacy) and/or provider/prescriber.

The QIN-QIOs' experience suggests three specific categories of prominent barriers faced in outpatient settings: (1) leadership engagement and staffing; (2) patient expectations; and (3) capacity, resources, and infrastructure. The table below provides common mitigating strategies for each barrier. Many of the implementation strategies included in this Field Guide may also address these challenges.

BARRIERS	SUGGESTED SOLUTIONS
<b>Challenges related to leadership engagement and staffing</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Partner with State Departments of Health, medical associations, boards, academic institutions, and statewide initiatives to raise awareness that antibiotic resistance is a pressing public health concern.</li> <li><input type="checkbox"/> Share national campaign materials (e.g., CDC, Choosing Wisely, etc.) to increase engagement and buy-in.</li> <li><input type="checkbox"/> Share data showing CDI rates and the risks associated with the use of certain antibiotics.</li> <li><input type="checkbox"/> Calculate rates of inappropriate prescribing (e.g., rates of antibiotic use for URI) by facility and share facility specific and facility comparison data with leaders.</li> <li><input type="checkbox"/> Emphasize patient safety and the importance of appropriate prescribing to limit adverse drug events.</li> <li><input type="checkbox"/> To minimize the impact of staff turnover, assign the antibiotic stewardship role in job descriptions. This will set the expectation for new hires to be qualified for the antibiotic stewardship responsibilities and ensure training on antibiotic stewardship role is conducted upon hire.</li> <li><input type="checkbox"/> Align stewardship strategies and activities with payment programs and quality improvement processes.</li> <li><input type="checkbox"/> Use antibiotic prescribing data from peer organizations and prescribers for peer comparisons.</li> </ul>
<b>Challenges related to patient expectations for antibiotics</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Promote use of prescription pads with alternatives to antibiotics (symptom relief interventions) to educate patients as to why an antibiotic is not being prescribed and increase satisfaction by providing alternative solutions for symptom relief.</li> <li><input type="checkbox"/> Learn motivational interviewing techniques to enhance communication with the patient.</li> <li><input type="checkbox"/> Train providers on communication techniques that can increase patient satisfaction in visits for which antibiotics are not prescribed.</li> <li><input type="checkbox"/> Display posters, flyers, and videos in the waiting room to educate patients on antibiotics prior to their scheduled appointment. Aim for messages to be delivered multiple times in different formats.</li> </ul>
<b>Challenges related to capacity, resources, and infrastructure</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Use chart audits and provide feedback from these audits to clinicians when prescribing data cannot be obtained from the electronic health record.</li> <li><input type="checkbox"/> Network with other settings (similar to your own) to share processes for retrieving data, to discuss diagnostic codes, and share examples of specific measures to track.</li> <li><input type="checkbox"/> Examine any standing order protocols that lead to over diagnosis (i.e., urinalysis for certain visits).</li> </ul>



## Conclusions

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Although antibiotic prescribing has improved since 2011, children under two and adults over the age of 65 still receive the most antibiotic prescriptions.<sup>8</sup> A draft proposal on the HAI Action Plan calls for federal agencies to work together on antibiotic stewardship efforts. Included in phase four is a goal to reduce inappropriate antibiotic use in outpatient settings by 20% by the year 2020.

CDC used evidence-based guidance and expert opinion to create the Core Elements of Antibiotic Stewardship in Outpatient Settings. Over the past year, QIN-QIOs have been in the field, working with thousands of outpatient settings to adopt these guiding elements. This Field Guide offers knowledge, strategies, tools, and resources for you to test and implement within your organization.

Several key findings have emerged as a result of the QIN-QIO work on antibiotic stewardship. First, is the importance of partnering with other organizations working on antibiotic stewardship initiatives to achieve commitment and to enable access to resources to support implementation. Resources include patient and provider education, data that supports the prioritization of antibiotic stewardship objectives and additional tools to help monitor and measure the impact of implementation. By engaging local partners, outpatient settings can create action on policy that will ultimately better support antibiotic stewardship across communities, statewide, and even at the national level. Outpatient settings can work with other providers to develop initiatives and monitor progress through sharing local data. The impact of antibiotic stewardship initiatives will be greater as more providers and partners are involved across a community.

At the setting level, maximizing stakeholder involvement in conceptualizing and implementing antibiotic stewardship is critical. Clinical and administrative staff at all levels should be involved in planning meetings in order to secure buy-in from those who will be putting new processes in place, and to ensure barriers are identified promptly so that workflows can be adjusted as necessary. In particular, involvement of those with expertise in information technology and setting-specific capabilities is necessary to ensure that changes to processes are made with EHR and other IT functionality in mind, and to optimize availability of data for ongoing monitoring.

Finally, antibiotic stewardship is essentially a behavior change intervention. An approach that provides education and resources to providers and to patients and their families is necessary to alter often long-held perceptions related to antibiotic use. Educating patients on the wide use of antibiotics and providing clinicians access to education and expertise will help realize changes needed to slow the growth of antibiotic resistance and advance patient safety goals, while patients remain at the center of care.

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<sup>8</sup> Centers for Disease Control and Prevention. 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>. Accessed June 15, 2018

## Appendix A: Overarching Resources

Resource Description	Link
<b>Selected Resources from CDC</b>	
Checklist for Clinicians: Core Elements of Outpatient Antibiotic Stewardship: Clinicians can use this checklist to ensure they are successfully implementing the Core Elements of Outpatient Antibiotic Stewardship: commitment, action, tracking and reporting, and, lastly, education and expertise.	<a href="https://www.cdc.gov/antibiotic-use/community/pdfs/16_268900-A_CoreElementsOutpatient_check_1_508.pdf">https://www.cdc.gov/antibiotic-use/community/pdfs/16_268900-A_CoreElementsOutpatient_check_1_508.pdf</a>
Checklist for Outpatient Care Facilities: Core Elements of Outpatient Antibiotic Stewardship: Outpatient care facilities can use this checklist to ensure they are successfully implementing the Core Elements of Outpatient Antibiotic Stewardship.	<a href="https://www.cdc.gov/antibiotic-use/community/pdfs/16_268900-A_CoreElementsOutpatient_check_2_508.pdf">https://www.cdc.gov/antibiotic-use/community/pdfs/16_268900-A_CoreElementsOutpatient_check_2_508.pdf</a>
Speakers discuss efforts to measure and improve antibiotic prescribing through stewardship. Video includes lessons learned from improving antibiotic use in pediatrics, and what providers and health systems can do to improve use in adults.	<a href="https://www.cdc.gov/grand-rounds/pp/2018/20180515-antibiotics-aware.html">https://www.cdc.gov/grand-rounds/pp/2018/20180515-antibiotics-aware.html</a>
Antibiotic Prescribing and Use in Doctor's Offices - Systematic Reviews of Outpatient Antibiotic Stewardship: These systematic reviews from the Centers for Disease Control and Prevention (CDC) provide evidentiary support of interventions and outcomes used to improve outpatient antibiotic prescriptions.	<a href="https://www.cdc.gov/antibiotic-use/community/improving-prescribing/evidence/systematic-reviews.html">https://www.cdc.gov/antibiotic-use/community/improving-prescribing/evidence/systematic-reviews.html</a>
Summary of recommendations for appropriate antibiotic prescribing, including clinical practice guidelines.	<a href="https://www.cdc.gov/antibiotic-use/community/for-hcp/outpatient-hcp/index.html">https://www.cdc.gov/antibiotic-use/community/for-hcp/outpatient-hcp/index.html</a>
<b>Selected Resources from QIN-QIOs</b>	
Outpatient Antibiotic Stewardship Playbook: The Telligen Outpatient Antibiotic Stewardship Playbook is designed to provide concrete strategies and suggestions for organizations committed to implementing successful antibiotic stewardship programs in outpatient settings. Use this Playbook as a practical guide to options and resources that clinicians in outpatient settings can use to create, implement, or strengthen antibiotic stewardship programs. Choose options that fit your local context, resources, and needs. It's not a list of "must dos" to be completed.	<a href="https://telligenqinqio.com/resource/outpatient-antibiotic-stewardship-playbook/">https://telligenqinqio.com/resource/outpatient-antibiotic-stewardship-playbook/</a>
Outpatient Antibiotic Stewardship Gap Analysis Tool: The Outpatient Antibiotic Stewardship Gap Analysis Tool compares your current antibiotic stewardship practices with identified best practices. This assessment will help you identify your organization's short- and long-term goals for antibiotic stewardship.	<a href="https://telligenqinqio.com/resource/outpatient-antibiotic-stewardship-gap-analysis-tool/">https://telligenqinqio.com/resource/outpatient-antibiotic-stewardship-gap-analysis-tool/</a>

Resource Description	Link
Steps to Combat Antimicrobial Resistance in Outpatient Settings: This two-page checklist style document was developed from a CDC online resource. The document lists steps and suggested interventions.	<a href="https://www.qualityinsights-qin.org/CMSPages/GetFile.aspx?guid=22a460bb-c206-41cf-b119-9a8e13ba4d18">https://www.qualityinsights-qin.org/CMSPages/GetFile.aspx?guid=22a460bb-c206-41cf-b119-9a8e13ba4d18</a>
Qualis Health QIN Antimicrobial Resources Page	<a href="http://medicare.qualishealth.org/projects/AMS-in-Outpatient-Settings/Selected-Resources">http://medicare.qualishealth.org/projects/AMS-in-Outpatient-Settings/Selected-Resources</a>
Antibiotic Stewardship Improvement Guide: This document provides electronic hyperlinks to resources and tools as sorted by Core Elements. Includes information for all healthcare settings, developed by Lake Superior QIN.	<a href="http://bit.ly/1P9yTdj">http://bit.ly/1P9yTdj</a>
This YouTube video from the Centers for Disease Control and Prevention (CDC) provides more information on the Core Elements of Antibiotic Stewardship in Outpatient Settings and includes a 15-minute Q&A between the presenter and webinar participants.	<a href="https://www.youtube.com/watch?v=aQhENZiISr0">https://www.youtube.com/watch?v=aQhENZiISr0</a>
Toolkit provides tools and resources to help implement the Core Elements in your facility, developed by HQI QIN.	<a href="http://www.hqi.solutions/wp-content/uploads/2017/11/Antibiotic-Stewardship-Toolkit_Final-1.pdf">http://www.hqi.solutions/wp-content/uploads/2017/11/Antibiotic-Stewardship-Toolkit_Final-1.pdf</a>
<b>Pharmacy Specific Resources</b>	
Community Pharmacy Antibiotic Stewardship Toolkit, developed by Lake Superior QIN.	<a href="http://bit.ly/2FuKdmg">http://bit.ly/2FuKdmg</a>
CDC Core Elements checklist designed for use by the community pharmacy setting.	<a href="http://healthinsight.org/files/Outpatient%20Antibiotic%20Stewardship/CDC_Core_Checklist_Community_Pharmacy_2018-04-19-form.pdf">http://healthinsight.org/files/Outpatient%20Antibiotic%20Stewardship/CDC_Core_Checklist_Community_Pharmacy_2018-04-19-form.pdf</a>
<b>Emergency Department and Urgent Care Specific Resources</b>	
MITIGATE Antimicrobial Stewardship Toolkit: This guide outlines how facilities can implement individualized, effective, and practical antimicrobial stewardship programs in acute care (emergency department and urgent care) settings.	<a href="https://qioprogram.org/antibiotic-stewardship-resources/">https://qioprogram.org/antibiotic-stewardship-resources/</a>
<b>Additional Selected Resources</b>	
Antibiotic Use in Outpatient Settings resource, developed by Pew Charitable Trusts	<a href="http://www.pewtrusts.org/en/research-and-analysis/reports/2016/05/antibiotic-use-in-outpatient-settings">http://www.pewtrusts.org/en/research-and-analysis/reports/2016/05/antibiotic-use-in-outpatient-settings</a>
The Center for Disease Research and Policy (CIDRAP) from the University of Minnesota is a premier source of information for news and resources. CIDRAP has a webpage dedicated to the Antibiotic Stewardship Program, including clinical tools. Other AS resources includes a YouTube Channel and weekly newsletter.	<a href="http://www.cidrap.umn.edu/asp/clinicaltools">http://www.cidrap.umn.edu/asp/clinicaltools</a>

Resource Description	Link
Association for Professionals in Infection Control and Epidemiology (APIC) resources on antimicrobial stewardship for healthcare professionals and consumers	<a href="https://apic.org/Resources/Topic-specific-infection-prevention/Antimicrobial-stewardship">https://apic.org/Resources/Topic-specific-infection-prevention/Antimicrobial-stewardship</a>
World Health Organization (WHO) Antimicrobial Resistance resources	<a href="http://www.who.int/antimicrobial-resistance/en/">http://www.who.int/antimicrobial-resistance/en/</a>
The Society for Healthcare Epidemiology of America (SHEA) is on the forefront in education, research, and guidelines on antimicrobial stewardship.	<a href="https://www.shea-online.org/index.php/practice-resources/priority-topics/antimicrobial-stewardship">https://www.shea-online.org/index.php/practice-resources/priority-topics/antimicrobial-stewardship</a>
Jumpstart Stewardship: Implementing Antibiotic Stewardship in Ambulatory Settings: A comprehensive workbook of AMS tools, developed by Washington State Department of Health, Qualis Health, and other AMS partners.	<a href="https://www.doh.wa.gov/Portals/1/Documents/5000/JumpStartStewardshipAmbulatorySettings.pdf">https://www.doh.wa.gov/Portals/1/Documents/5000/JumpStartStewardshipAmbulatorySettings.pdf</a>



## Appendix B: List of Acronyms

ACRONYM	MEANING
ADE	Adverse Drug Events
AS	Antibiotic Stewardship
CAH	Critical Access Hospitals
CDC	Centers for Disease Control and Prevention
CDI	Clostridium Difficile Infection
CDS	Clinical Decision Support
CME	Continuing Medical Education
CMS	Centers for Medicare and Medicaid Services
ECHO	Extension for Community Healthcare Outcomes
ED	Emergency Department
EHR	Electronic Health Record
EMR	Electronic Medical Record
FQHC	Federally Qualified Health Center
ID	Infectious Disease
IDSA	Infectious Diseases Society of America
IT	Information Technology
PDSA	Plan, Do, Study, Act
QI	Quality Improvement
QIN NCC	Quality Innovation Network National Coordinating Center
QIN-QIO	Quality Innovation Network - Quality Improvement Organization
URI	Upper Respiratory Infection
UTI	Urinary Tract Infection