StratisHealth Rural Quality Improvement Technical Assistance

Antibiotic Stewardship Implementation: Suggested Strategies from High Performing Critical Access Hospitals

September 2019

Note: The CDC released an updated version of the Core Elements in late 2019. The updates to the core elements reflect refinements based on lessons learned since the original release in 2014. The strategies and considerations for CAHs highlighted in this document continue to align with the revised core elements.
The resource links in this document are updated to reflect the most current information. (April 2020)

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Overview....2
Background....2
The Core Elements of Antibiotic Stewardship....2
The NHSN Annual Facility Survey....3
Method....3
Focus Group Findings....5
Leadership....5
Accountability....6
Drug Expertise....6
Action....7
Tracking....9
Reporting....9
Education....10
Other Focus Group Questions/Findings....10
Recurring Themes....11
Appendix A: Antibiotic Stewardship Focus Group Questions....13
Appendix B: Antibiotic Stewardship Focus Group Follow-Up Questions....14
References....15

Overview

This resource shares antibiotic stewardship best practices of high performing critical access hospitals (CAHs) identified through focus group discussions with 34 hospitals from across 25 states. The report includes:

- An overview of the core elements of hospital antibiotic stewardship
- Methodology for selection of high-performing CAHs and the focus group process
- Suggested strategies, barriers, considerations, and lessons learned through the focus groups, summarized by antibiotic stewardship core element
- Additional focus group findings regarding antibiotic stewardship beyond the core elements
- Recurring themes

Background

Improving antibiotic use in hospitals is imperative to improving patient outcomes, decreasing antibiotic resistance, and reducing health care costs. According to the Centers for Disease Control and Prevention (CDC), 20-50% of all antibiotics prescribed in US acute care hospitals are either unnecessary or inappropriate, leading to serious side effects such as adverse drug reactions and infections like *Clostridioides difficile* (CDI).[1] Overexposure to antibiotics also contributes to antibiotic resistance, making them less effective.

In 2014, recognizing the positive impact antibiotic stewardship programs can have on improving quality of care and patient safety, reducing rates of CDI and antibiotic resistance, and cost savings, the CDC released the Core Elements of Hospital Antibiotic Stewardship Programs guide. The resource identifies key structural and functional aspects of effective programs and elements designed to be flexible enough to be feasible in hospitals of any size. The CDC later released another resource, Implementation of Antibiotic Stewardship Core Elements at Small and Critical Access Hospitals, which guides hospitals looking to implement antibiotic stewardship, taking into account potential limitations regarding resources, infrastructure, and staffing to support a program.[2]

In summer 2016, the Centers for Medicare and Medicaid Services (CMS) released a proposed rule to update the Conditions of Participation (COPs) to which CAHs must adhere to participate in the Medicare and Medicaid programs. The proposed rule included a requirement for CAHs to implement an antibiotic stewardship program.[3] In alignment with this, the Federal Office of Rural Health Policy added antibiotic stewardship to the Medicare Beneficiary Quality Improvement Project (MBQIP) as a core measure under the Patient Safety/Inpatient domain, with the expectation that all CAHs have a fully implemented antibiotic stewardship program by August 31, 2022. To monitor progress, FORHP uses data from the CDC National Healthcare Safety Network (NHSN) Annual Facility Survey.

The Core Elements of Antibiotic Stewardship

The core elements of hospital antibiotic stewardship as defined by the CDC are:

- Leadership Commitment: dedicating necessary human, financial, and information technology resources.
- Accountability: Appointing a single leader responsible for program outcomes.
- Drug Expertise: Appointing a single pharmacist leader responsible for working to improve antibiotic use.
- Action: Implementing at least one recommended policy or intervention to improve antibiotic use.

- Tracking: Monitoring antibiotic prescribing and resistance patterns.
- Reporting: Regular reporting of information on antibiotic use and resistance to doctors, nurses, and relevant staff.
- Education: Educating clinicians about resistance and optimal prescribing.

For more information, see the CDC's Core Elements of Hospital Antibiotic Stewardship Programs guide.[4]

The NHSN Annual Facility Survey

To meet the requirements for reporting antibiotic stewardship for MBQIP, hospitals must complete the NHSN Annual Facility Survey. The survey becomes available early in the calendar year and is completed to represent the previous full calendar year. For example, in 2018, hospitals complete a survey for calendar year 2017.

The survey covers a breadth of topic areas, one of which is antibiotic stewardship. Depending on how hospitals answer the relevant questions, they are given credit for implementing elements of antibiotic stewardship. This resource reflects the questions about antibiotic stewardship that were asked on the 2017 survey (submitted in 2018) and breaks the questions down by core element.

Method

Hospital Selection

The goal of the focus groups was to gather promising strategies and lessons learned from high performing CAHs. A large contributing factor to the implementation of an antibiotic stewardship program in a CAH is whether the CAH is independent or part of a health system. Focus groups were stratified in this way to facilitate better discussion. NHSN Annual Facility Survey data from the 2017 survey (submitted in 2018) was stratified into CAHs that are independent and those that are part of a health system based on 2017 American Hospital Association data.

The NHSN Annual Facility Survey data submitted in 2018 was analyzed to identify high performing CAHs, based on the following criteria:

- First, CAHs had to have implemented all seven Core Elements
- Furthermore, independent CAHs had to have answered "Yes" to all three tracking questions and four or five action questions, and CAHs that are part of a health system had to have answered "Yes" to all three tracking questions and all five action questions

From the list of hospitals that met the qualifications above and ensuring geographic representation based on National Organization of State Offices of Rural Health region designations, random sampling was used to identify 30 CAHs that were part of a health system and 30 that were independent.[5] To ensure a breadth of feedback was gathered, efforts were made to remove duplicative hospital systems within a state, recognizing that sometimes naming conventions of hospitals don't lend themselves to understanding system affiliation. Alternative CAHs were identified using the same methodology.

Based on their knowledge of CAHs, state Flex programs were asked to confirm the high performing status of the hospitals randomly selected from their respective states. Invitations to participate were distributed to CAHs by the state Flex programs.

Focus Group Process

Hospitals were asked to self-identify their status as part of a health system or not during the sign-up process, which dictated the time slots they were able to choose from to participate in one of the focus groups. In the end, four focus groups were scheduled for two hours each. The focus groups were split so that two were comprised of participants at independent CAHs and two with participants from CAHs that were part of a health system. This was done to enhance the level of comfort and camaraderie of participants. Of the 34 total participating hospitals, 15 were independent, and 19 were part of a health system.

Focus group questions, included in Appendix A and detailed throughout the Focus Group Findings, were sent to participants beforehand so they would have an opportunity to review and prepare their responses. CAHs self-selected who would represent them in the focus group and many had more than one person participate. Participants included pharmacists, nurses, infection control preventionists, and quality leaders.

Focus groups were hosted using a webinar platform with interactive audio. Initial and wrap-up questions in the focus groups were conducted in a round-robin format to ensure everyone had a chance to share. Throughout the remainder of the focus groups, answers were solicited voluntarily, both through audio and chat. In addition to a facilitator, there was a support person; both tracked responses throughout and requested responses from CAHs that hadn't recently shared.

After the focus groups, all participants were asked to complete a brief follow-up questionnaire, included in Appendix B. The purpose of the questionnaire was to further clarify specific practices across CAHs to quantify how many had adopted specific practices or approaches. Twenty of the 34 participating CAHs completed the follow-up questionnaire.

The following CAHs participated in the Antibiotic Stewardship Focus Groups:

Independent CAHs
Bronson LakeView Hospital, Michigan
Central Montana Medical Center, Montana
Clara Barton Hospital, Kansas
Covington County Hospital, Mississippi
Gothenburg Health, Nebraska
Green County General Hospital, Indiana
Liberty Dayton Regional Medical Center, Texas
Mt. San Rafael Hospital, Colorado
Pointe Coupee General Hospital, Louisiana
Shenandoah Medical Center, Iowa
Sidney Health Center, Montana
Snoqualmie Valley Hospital, Washington
South Lyon Medical Center, Nevada
Summit Pacific Medical Center, Washington
Thayer County Health Services, Nebraska

System-Affiliated CAHs
Aspirus Iron River Hospital and Clinics, Michigan
Carilion Stonewall Jackson Hospital, Virginia
CHI St. Alexius Health – Turtle Lake, North Dakota
Clarke County Hospital, Iowa
Community Memorial Hospital, New York
Fairview Hospital, Massachusetts
Gundersen Moundview Hospital and Clinics, Wisconsin
Harrison Community Hospital, Ohio
Ka'u Hospital, Hawaii
Marshfield Medical Center - Ladysmith, Wisconsin
Mercy Hospital Lincoln, Missouri
Mercy Hospital Logan County, Oklahoma
Porter Medical Center – UVMHN, Vermont
Sanford Clear Lake Medical Center, South Dakota
Sanpete Valley Hospital, Utah
Ascension Seton Highland Lakes Hospital, Texas
Soldiers and Sailors Memorial Hospital, New York
St. Michael's Hospital Avera, South Dakota
UPMC Susquehanna Muncy, Pennsylvania

Focus Group Findings

The findings below are organized by the seven core elements of hospital antibiotic stewardship. For each, the following information is provided:

- The NHSN Annual Facility Survey questions referenced from the survey submitted in 2018, which reflected activities carried out in 2017
- Focus group questions that were geared towards learning more about this element
- Suggested strategies, barriers, considerations, and lessons learned from focus group participants, which are called out in boxes

A few focus groups questions were related to, but not specific to the core elements. Findings from these questions are woven through the core elements below.

- How (or to what extent) are you partnering or leveraging relationships with any larger hospitals or other external organizations/agencies in your antibiotic stewardship work?
- Which of the seven core elements of antibiotic stewardship was the easiest to attain?
- What were your biggest barriers to implementing antibiotic stewardship? How did you overcome them?
- What is one lesson you would share with other CAHs about your antibiotic stewardship efforts?

Finally, there were a few focus group questions that were not directly linked to the core elements. Those questions and findings are detailed at the end of this section.

Leadership

NHSN Annual Facility Survey Questions

An affirmative answer to either gives the hospital credit for this core element.

- Does your facility have a written statement of support from leadership that supports efforts to improve antibiotic use (antibiotic stewardship)?
- Does your facility provide any salary support for dedicated time for antibiotic stewardship leadership activities?

Related Focus Group Question

- How and when did you start your journey towards implementing antibiotic stewardship?

Leadership

- Among focus group participants, driving factors for implementing antibiotic stewardship and gaining leadership support included:
  - The 2016 Centers for Medicare & Medicaid Services (CMS) proposed rule that would make an active antibiotic stewardship program a requirement for all hospitals
  - Joint Commission standards requiring antibiotic stewardship (2016)
  - For those that are part of health systems, encouragement or required participation from the system level

Considerations:

- Nearly half of all focus group participants indicated salary support for dedicated antibiotic stewardship leadership activities on the NHSN Annual Facility Survey submitted in 2018 (compared to 26% nationally)

Accountability

NHSN Annual Facility Survey Question

An affirmative answer gives the hospital credit for this core element.

- Is there a leader responsible for stewardship activities at your facility? If yes, what is the position of this leader?

Accountability

• Focus group hospitals were split as to whether accountability was among the easiest or most difficult elements to implement.

Barriers:

• Finding the right person to serve as the lead
• Ensuring appropriate allocation of resources so the lead can properly oversee the work

Strategies: Although the leader responsible for antibiotic stewardship doesn't have to be a physician, finding a physician champion to partner with pharmacy in leading antibiotic stewardship is very helpful in securing further clinician buy-in to various aspects of the work.

Drug Expertise

NHSN Annual Facility Survey Question

An affirmative answer gives the hospital credit for this core element.

- Is there at least one pharmacist responsible for improving antibiotic use at your facility?

Related Focus Group Question

- How are you accessing pharmacy support for the program?

Drug Expertise

Considerations:

• 29 out of 34 participating hospitals had pharmacists on site
• Many pharmacists have Society of Infectious Disease Pharmacists (SIDP) certification

Strategies

• Some are leveraging relationships or systems-affiliations with larger facilities to consult with infectious disease physicians
• Even those that have pharmacists on site identified hurdles with afterhours pharmacy coverage. Some solutions included:
  ○ Tele-pharmacy, including use of video-phone or other web-based interactive platforms
  ○ Remote verification through contracted pharmacy services
  ○ Adopting a limited formulary to ensure timely access to antibiotics after hours, but restricting those that require pre-authorization

Action

NHSN Annual Facility Survey Questions
An affirmative answer to any one of these gives the hospital credit for this core element.

- Does your facility have facility-specific treatment recommendations, based on national guidelines and local susceptibility, to assist with antibiotic decision making for common clinical conditions?
- Does a physician or pharmacist review courses of therapy for specified antibiotic agents and communicate results with prescribers at your facility?
- Do any specific antibiotic agents need to be approved by a physician or pharmacists prior to dispensing at your facility?
- Does your facility have a policy that requires prescribers to document an indication for all antibiotics in the medical record during order entry?
- Is there a formal procedure for all clinicians to review the appropriateness of all antibiotics at or after 48 hours from the initial orders (e.g., antibiotic time out)?

Related Focus Group Questions:

- Which activities were the easiest to implement? Why?
- Which were the most difficult to implement? Why?

Because action is at the heart of any antibiotic stewardship program, the suggested strategies, barriers, considerations, and lessons learned for this core element are broken down into the five options aligning with the survey questions.

Facility-Specific Treatment Recommendations

Barriers:

- Determining who will be involved in making the decisions (all physicians, some physicians, pharmacist, etc.)
- Low patient volumes at many CAHs limit the frequency with which an antibiogram can be updated, if at all
- Some CAHs don't have the lab resources required to develop their own antibiogram

Strategies: Most focus group participants are using a facility-specific antibiogram updated at least annually, working with health system affiliates, nearby universities, or other partners to develop them.

Considerations:

- In addition to, or instead of, antibiograms, focus group participants indicated they are using empiric guidelines to define treatment recommendations.
- Once treatment recommendations have been decided upon, many are leveraging functionality within the electronic health record (EHR) to drive appropriate prescribing behavior, such as defaulting the recommended antibiotic based on the diagnosis or adding required clicks if a prescriber is trying to override the recommended treatment.
- Some focus group participants noted that their teams participate in daily interdisciplinary huddles, bringing together a variety of team members, including pharmacy and physicians, to discuss cases and appropriate treatment options in real time.

Prospective Audit and Feedback

Barriers:

- Determining who will conduct the audit, which requires allocation of resources
- Establishing clinician buy-in for the process

Strategies:

- Most focus group participants identified a pharmacist at the CAH or an infectious disease physician at the health system level as responsible for the audits.

Considerations: Determining what to share and when will depend on the culture of the team. Options shared by focus group participants include:

- Individualized data shared one-on-one with prescribers
- Aggregate data shared with the team of prescribers

Prior Authorization for Specific Antibiotic Agents

Barriers:

- Lack of 24-hour pharmacy coverage
- Establishing clinician buy-in for the process

Strategies:

- Most focus group participants have pharmacy on-site during the day with steps in place for immediate pharmacy consult for specific antibiotic agents
- After-hours coverage is most often provided through contract or a health system affiliate site, set up with the same protocols

Considerations: Other activities that support the goals of this action include:

- Adopting a limited formulary to ensure timely access to antibiotics after hours, but restrict those that require pre-authorization
- Developing EHR workflows to drive recommended treatment

Documentation of Indication for All Antibiotics

Barriers:

- Lack of EHR functionality to support the workflow
- Establishing clinician buy-in for the process

Strategies:

- Most focus group participants are leveraging their EHRs to assist with this, in many cases making it a requirement for ordering medications
- Others are using open notes to capture the information and conducting manual audits for compliance

Considerations: Some hospitals tie adherence to this requirement to clinician performance reviews.

Antibiotic Time-Out

Barriers:

- Lack of EHR functionality to support the workflow
- Ensuring consistent documentation of the process.

Action: Alternative or additional options for making it a standard part of workflow include:

- A daily report from pharmacy to nursing that reflects how long patients have been on antibiotics
- Reviewing appropriateness of antibiotics during daily rounds
- Pharmacy manually generating a note on the patient chart reminding the clinicians to complete at time-out

Considerations: Most focus group participants note that it usually takes more than 48 hours to get culture results, so time-outs are happening somewhere between the 72-96 hour time frame.

Tracking

NHSN Annual Facility Survey Questions

An affirmative answer to any one of these gives the hospital credit for this core element.

- (If facility has a policy requiring prescribers to document an indication for all antibiotics in the medical record or during order entry…) Has adherence to the policy been monitored?
- (If your facility has facility-specific treatment recommendations based on national guidelines and local susceptibility to assist with antibiotic selection for common clinical conditions…) Has adherence to the recommendations been monitored?
- Does your facility monitor antibiotic use (consumption) at the unit, service, and/or facility-wide?

Related Focus Group Question

- How do you use knowledge gained through protocol adherence monitoring to improve the program?

Tracking

Strategies: Focus group hospitals are using their EHR to capture data for tracking antibiotic stewardship

Considerations: Examples of metrics used by focus group participants include:

- Days of therapy/1000 patients
- Immune dosing
- Frequency of use for specific antibiotics
- Orders accepted/rejected during prior authorization process
- IV to PO conversion rates

Reporting

NHSN Annual Facility Survey Questions

An affirmative answer to either of these gives the hospital credit for this core element.

- Does a physician or pharmacist review courses of therapy for specified antibiotic agents and communicate results with prescribers at your facility?
- (If your facility monitors antibiotic use…) Are the facility- and/or unit- or service-specific reports on antibiotic use shared with prescribers?

Related Focus Group Question

- How often and through what means is antibiotic tracking data shared within the organization?

Reporting

Strategies:

- Most focus group participants indicated they are sharing tracking data at medical staff meetings.
- Many are using scorecards and dashboards to convey performance data.
- It is essential to leverage knowledge from tracking to drive improved workflows.

Education

NHSN Annual Facility Survey Question

An affirmative answer gives the hospital credit for this core element.

- Has your facility provided education to clinicians and other relevant staff on improving antibiotic use?

Related Focus Group Question

- How often and through what means are staff and clinicians educated on antibiotic use?

Education

Barriers: Many focus group participants identified education as the most difficult core element; it is easy to tick the box and meet the survey requirement, but it is difficult to make the education meaningful and establish clinician buy-in.

Strategies and Considerations: Strategies to address education include:

- Get Antibiotic Stewardship on meeting agendas, including those with medical staff and nursing
- Leverage, but don't rely on, the learning management system
- Include messages about antibiotic stewardship in staff newsletters
- Encourage participation in webinars (they are often free and may come with continuing education credits)
- Include baseline education as part of orientation and on-boarding for new staff and clinicians
- Identify physician and nursing champions to engage and encourage their colleagues
- Watch for opportunities to participate in learning action networks or other organized projects focused on antibiotic stewardship

Other Focus Group Questions/Findings

There were three additional questions asked of the focus group participants that didn't fit neatly into the seven core elements. Below are the questions and some of the key focus group findings.

- What efforts have there been to educate patients and families regarding appropriate antibiotic use?
    - Verbal education to patients covered by various members of the caregiving team (e.g., pharmacy, nursing, physicians). Some key times that were identified included at the start of treatment, during team rounding, and during discharge rounding.
    - Written education to patients prescribed an antibiotic, including free information guides from the CDC.
    - Posters through inpatient, outpatient, and clinic patient areas with information about antibiotic stewardship and resistance, including commitment posters that call out the commitment of providers at that facility to follow prescribing guidelines and why it is important.

  - Group education offerings such as health fairs, including at local schools, and participation in Antibiotic Stewardship Awareness Week that engage people throughout the facility, including patients and visitors.
  - Many focus group participants identified work going on at the clinic level to promote antibiotic stewardship, including treatment kits and prescriptions for viral infections that call for things like rest and fluids, cough drops, honey, etc.
- How are you working across settings of care (e.g., nursing homes, clinics, etc.) to address antibiotic stewardship at the community level?
  - In large part, this depended on the organization of the facility and whether it was directly affiliated or owned any additional settings of care such as a clinic or skilled nursing facility (SNF).
  - For those working with a SNF, some are sharing the antibiogram, and many are focusing on appropriate diagnosis and treatment for urinary tract infections.
  - In some communities, the same physician or group of physicians are working across all the settings, which offers an opportunity to develop consistent messaging for patients regarding appropriate antibiotic use.
- How do you go about setting goals and implementing change initiatives related to antibiotic stewardship?
  - Upon embarking on the journey of implementing antibiotic stewardship, many hospitals utilized the seven core elements from the CDC to lay out their goals, with some developing a performance improvement plan and identifying a team lead for each element.
  - Hospitals participating in a learning and action network or another such initiative, including any grant-funded projects, may have goals laid out for them.
  - Some health-system affiliated CAHs take their cue from the system, while others set goals at the individual hospital level.

Recurring Themes

While there are many similarities across high performing CAHs regarding approaches to implementing antibiotic stewardship, there are also many different approaches from which to choose. Much will depend on the culture and resources of the individual facility. A few recurring themes emerged across multiple core elements that are worth noting:

- **Engaging clinicians**
  A successful antibiotic stewardship program relies on the buy-in of prescribers. The best written policies and protocols are a waste if they aren't being followed. Facilities may face different challenges based on the culture of their organizations. Some suggestions to consider:
  - Find a physician champion to work on antibiotic stewardship and liaison with other prescribers
  - Invite nay-sayers to participate in the antibiotic stewardship committee, so they have ownership of the outcomes, and through their buy-in, they can become champions of the cause
  - Evaluate whether the prescribing team at the facility is encouraged by competition and if so, consider sharing individualized performance data (blinded or unblinded) with the team
  - Consider linking performance outcomes for antibiotic stewardship to clinician evaluations
- **Electronic health records (EHRs)**
  When possible, leverage the EHR to support antibiotic stewardship by driving workflows, informing clinical decision making, capturing required information from prescribers, and for data tracking.

Make the right thing to do the easy thing to do by reducing the number of clicks it takes to prescribe the recommended treatment and forcing specific data capture when possible and appropriate.

- **Sharing data**
  Much as protocols are worthless if they aren't being followed, data is useless if it isn't being used. Make antibiotic stewardship data as transparent and easily accessible as possible. Share it broadly and welcome feedback from frontline staff and prescribers who may have suggestions of how to improve processes to support the goals of the program.
- **Education**
  Education to care providers regarding antibiotic stewardship is not a one and done event. Leverage updated performance data and antibiograms to keep the topic a priority. Invite others beyond pharmacists to participate in webinars and other educational opportunities on the topic. And make sure antibiotic stewardship is on the agenda at medical staff, quality, nursing meetings, and the like.

Appendix A: Antibiotic Stewardship Focus Group Questions

- How and when did you start your journey towards implementing antibiotic stewardship?
- How (or to what extent) are you partnering or leveraging relationships with any larger hospitals or other external organizations/agencies in your antibiotic stewardship work?
- The list of activities below count towards the *Action* core element.
    - Facility-specific treatment recommendations for common clinical conditions
    - Physician or pharmacist review for specific antibiotic agents
    - Prior approval from physician or pharmacist before dispensing specified antibiotic agents
    - Requiring documentation of indication for all antibiotics
    - Antibiotic time out to review appropriateness of antibiotics

  Which of these were the easiest to implement and why?
  Which were the most difficult to implement and why?
- How are you accessing pharmacy support for the program?
- How often and through what means is antibiotic tracking data shared within the organization?
- How do you use knowledge gained through protocol adherence monitoring to improve the program?
- How often and through what means are staff and clinicians educated on antibiotic use?
- What efforts have there been to educate patients and families regarding appropriate antibiotic use?
- How are you working across settings of care (e.g., nursing homes, clinics, etc.) to address antibiotic stewardship at the community level?
- How do you go about setting goals and implementing change initiatives related to antibiotic stewardship?
- Overall, which of the seven core elements of antibiotic stewardship was the easiest to attain?
- What were your biggest barriers to implementing antibiotic stewardship? How did you overcome them?
- What is one lesson you would share with other CAHs about your antibiotic stewardship efforts?

Appendix B: Antibiotic Stewardship Focus Group Follow-Up Questions

- Does your CAH utilize an antibiogram? **[Yes/No]**
  - **If yes** - Is it specific to your facility? **[Yes/No]**
    - **If no** - Please describe the patient population included in the antibiogram **[Open text]**
  - **If yes** - Who develops the antibiogram? **[Open text]**
  - **If yes** – How frequently is the antibiogram updated? **[Open text]**
- Did the antibiotic stewardship standards set forth by the Joint Commission play a role in launching or enhancing your antibiotic stewardship program? Briefly explain. **[Open text]**
- Does your facility leverage your electronic health record to assist with [Select all that apply]?
  - Monitoring adherence to facility-specific treatment recommendations
  - Monitoring adherence to required documentation of indication for antibiotic prescribing
  - Monitoring antibiotic use at various levels (provider, unit, service, facility)
  - Requiring documentation of indication for antibiotic prescribing
  - Requiring time out to review appropriateness of antibiotics
  - Sharing results of physician or pharmacist review for specific antibiotic agents with prescriber
  - Other (please describe) **[Open text]**
- Does your facility utilize a limited formulary to support antibiotic stewardship activities? **[Yes/No]**
  - **If yes** – Please briefly describe the process for determining what is included in the formulary and who was involved in those decisions. **[Open text]**
  - **If yes** – Is pharmacy or physician review required prior to use of any of the antibiotics in the formulary? Briefly explain. **[Open text]**
- Does your facility have 24-hour pharmacy coverage on site? **[Yes/No]**
  - **If yes** – Is the pharmacy responsible for all antibiotic prescribing review? Briefly explain. **[Open text]**
  - **If no** – please briefly describe your process for prior approval before dispensing specific antibiotic agents after hours. **[Open text]**
- Do any pharmacists supporting your antibiotic stewardship program have Society of Infectious Diseases Pharmacists (SIDP) certification? Briefly explain. [Open text]
- Does your facility receive support with antibiotic stewardship from any of the following? [Select all that apply]
  - Hospital Improvement and Innovation Network
  - Quality Improvement Organization (QIN-QIO)
  - State Department of Health/Antibiotic Resistance Coordinator
  - State Flex Program
  - Other (please specify) **[Open text]**
- Is there anything else you would like us to know about antibiotic stewardship at your critical access hospital? **[Open text]**

References

All reference links accessed/current as of April 2020.

[1] https://www.cdc.gov/antibiotic-use/core-elements/hospital.html
[2] https://www.cdc.gov/antibiotic-use/healthcare/pdfs/core-elements-small-critical.pdf
[3] https://www.federalregister.gov/documents/2016/06/16/2016-13925/medicare-and-medicaid-programs-hospital-and-critical-access-hospital-cah-changes-to-promote#h-30
Note – this proposed rule was finalized in late September 2019:
https://www.federalregister.gov/documents/2019/09/30/2019-20736/medicare-and-medicaid-programs-regulatory-provisions-to-promote-program-efficiency-transparency-and
[4] https://www.cdc.gov/antibiotic-use/healthcare/pdfs/core-elements.pdf
[5] https://nosorh.org/wp-content/uploads/2016/07/NOSORH-Region-Map.pdf