



Core Elements of Antibiotic Stewardship for Health Departments

Long-term Care

Dental Care

Outpatient Care

Health Department

Acute Care

Emergency Department

Urgent Care



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Centers for Disease Control and Prevention
Mandy K. Cohen, MD, MPH, Director

National Center for Emerging and Zoonotic Infectious Diseases
Daniel B. Jernigan, MD, MPH, Director

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Introduction

Ensuring appropriate use of antibiotics is one of CDC's core strategies to combat the urgent threat of antimicrobial resistance and to provide the best, safe care. Antibiotic stewardship can optimize the treatment of infections and ensure equitable access to high quality health care. **State and local health department antibiotic stewardship programs** (SLHD-ASPs) play an important role in guiding antibiotic stewardship efforts in various healthcare settings and in promoting appropriate antibiotic use for all patients in their communities.

The Centers for Disease Control and Prevention (CDC) released the [Core Elements of Antibiotic Stewardship](#) for healthcare settings outlining structural and procedural components that are associated with successful antibiotic stewardship programs. This document adapts the *Core Elements* framework to outline the structure of a SLHD-ASP and provides recommended stewardship implementation activities based on experiences of successful SLHD-ASPs (Figure 1). State and local health departments vary by their capacity, resources, and governance.¹ SLHD-ASPs need to select and adapt stewardship strategies to best meet local healthcare needs. Smaller local health departments, U.S. territories, and Affiliated Pacific Islands can select specific implementation strategies based on their priorities and available resources.²

SLHD-ASP's unique positions allow them to guide and support stewardship activities and collaboratives with a variety of partners including integrated health systems, payers, professional organizations, academic partners, quality improvement organizations, licensing and regulatory agencies, and others. SLHD-ASPs can work together as part of regional and national collaboratives to engage with different healthcare settings including acute care (e.g., hospitals, critical access hospitals, long-term acute care hospitals), outpatient care (e.g., ambulatory care, urgent care, dialysis, dental), and long-term care settings (e.g., nursing homes, skilled-nursing, ventilator skilled-nursing and assisted living facilities).^{3, 4}

Core Elements of Antibiotic Stewardship for Health Departments



Figure 1: The Core Elements of Antibiotic Stewardship for Health Departments



Leadership Commitment

Engaging with senior health department leadership to establish antibiotic stewardship as a priority and to secure dedicated human and financial resources is critical for ensuring adequate support, funding, and visibility of the SLHD-ASP.⁵ A lack of necessary resources is commonly cited as the top barrier for SLHD-ASP's ability to engage in stewardship activities. Leadership commitment enables the creation of effective and sustainable SLHD-ASPs.

Health department leadership can demonstrate commitment by implementing the following strategies:

- Identify a senior leader within the health department who can serve as a “champion” to advocate for and promote antibiotic stewardship priorities.

- Issue a formal statement of support for antibiotic stewardship and include in the health department or program annual report.
- Have regular meetings with leaders of the SLHD-ASP to assess the resources and support needed to accomplish the program's goals.
- Create a reporting structure for the SLHD-ASP to ensure that information on stewardship activities and outcomes is shared with relevant partners and organizations.
- Integrate the SLHD-ASP with other health department program activities including healthcare-associated infection (HAI) prevention and outbreak investigation.
- Consider engaging with leadership in other state or local agencies on antibiotic stewardship efforts (e.g., agriculture, environmental agencies) to support One Health collaboratives.
- Support SLHD-ASPs in engaging healthcare leadership in multi-facility quality improvement collaborative efforts to improve antibiotic use.
- Ensure appropriate staffing and resource allocation to effectively manage and sustain the SLHD-ASP.
- Support training and education for SLHD-ASP program leaders and staff.



Accountability

The SLHD-ASP must have designated leadership who are accountable for the development, implementation, evaluation, and reporting of stewardship activities. SLHD-ASPs must also include various team members with key cross-cutting expertise and dedicated time to support stewardship activities.

The following implementation strategies are important for ensuring antibiotic stewardship program accountability:

- Have a designated antibiotic stewardship leader or co-leaders (such as physician and pharmacist) who are accountable for the management and outcomes of antibiotic stewardship activities and for reporting to senior health department leadership.
- Appoint additional individuals supporting SLHD-ASP activities in part-time or full-time capacity.
- Ensure that the SLHD-ASP includes individuals with skills and experience in infectious diseases, clinical stewardship implementation, microbiology, epidemiology, data analysis, information technology, health communication, education, evaluation, project support and grant management.
- Outline stewardship-related duties in job descriptions and annual performance reviews for the SLHD-ASP leaders and key support staff.



Stewardship Expertise

Antibiotic stewardship leader/co-leaders should have expertise and experience implementing stewardship activities. This is especially important when supporting healthcare settings with limited access to stewardship expertise.

The following are important strategies for ensuring stewardship expertise:

- Appoint stewardship leader/co-leaders with training and experience in infectious diseases and/or antibiotic stewardship such as a physician and a pharmacist.
- Offer SLHD-ASP staff access to stewardship training courses and/or certificate programs to help develop and maintain stewardship expertise.
- Provide stewardship leader/co-leaders access to local or remote stewardship experts to ensure support can be provided across healthcare settings.
- Establish an external multidisciplinary advisory group that can support the stewardship leader/co-leaders on identifying and implementing the most effective stewardship strategies⁶ in different healthcare settings.



Action

Evidence-based antibiotic stewardship interventions can improve patient outcomes.⁷⁻⁹ SLHD-ASPs can facilitate the implementation of antibiotic stewardship interventions¹⁰⁻¹² specific to different healthcare settings by:

- ▶ Developing a strategic plan
- ▶ Providing direct technical assistance
- ▶ Forming and fostering stewardship collaboratives
- ▶ Supporting the development and implementation of guidance and policies

Collaboratives should leverage data on stewardship activities and antibiotic use to identify facilities and settings who need stewardship support the most, especially prioritizing settings with limited access to stewardship expertise such as long-term care or outpatient settings and critical access hospitals. New stewardship activities or collaboratives should be initiated in a stepwise fashion to build relationships and assess outcomes to inform future activities. Smaller local health departments can engage with their respective state activities or select their own actions based on available resources and local needs.

Consider the following antibiotic stewardship implementation strategies:

Develop a Strategic Plan

- Create an annual strategic plan outlining short and long-term goals and activities. Consider a variety of activities that require different levels of effort and engagement to maximize the impact of existing resources while prioritizing settings with limited access to stewardship expertise.
- Develop a contact list of strategic internal and external partners who can be engaged in different antibiotic stewardship activities. Examples of partners include

hospital and long-term care associations, health systems, quality improvement organizations and networks, licensing boards (e.g., medical, pharmacy, dental), local chapters of professional associations (e.g., medical, pharmacy, nursing, dental, and infection prevention), payers, local health departments, dialysis networks, and academic institutions with clinical and public health training programs.

Provide Direct Technical Assistance

- Provide technical assistance to antibiotic stewards, healthcare professionals, facilities, or health systems that need additional support to improve stewardship implementation. Examples include facilities identified through tracking data on *Core Elements* uptake or in the setting of an outbreak response.
- Support healthcare facilities with enrollment in the National Healthcare Safety Network (NHSN) and submission of validated data to the Antimicrobial Use and Resistance Module.¹³
- Engage with other SLHD-ASPs implementing similar stewardship actions to share experiences and lessons learned.

Form and Foster Collaboratives

- Form stewardship collaboratives with academic institutions, healthcare facilities and other partners in different healthcare settings.¹⁴ The objectives of stewardship collaboratives can include the implementation and evaluation of local-level interventions informed by antibiotic use data. SLHD-ASPs can play an important role in interfacility coordination.
- Include local health departments in existing state initiatives and regional collaboratives.
- Support collaboratives to provide practice level and/or prescriber-level feedback with peer comparisons in different healthcare settings. Leverage antibiotic use data to calculate an established antibiotic use metric (e.g., HEDIS measure)¹⁵ or stratified by practice setting, prescriber specialty, drug or class of interest, or condition-specific guideline concordance.
- Engage with healthcare payers, including the state Medicaid agency. Medicaid agencies have access to and capacity to analyze provider-level outpatient antibiotic prescribing data for audit and feedback interventions. Medicaid agencies can also apply their value-based reimbursement programs to outpatient antibiotic use through adopting quality measures on antibiotic prescribing.
- Explore collaboration with other health department activities to support stewardship (e.g., HAI surveillance, outbreak response, prescriber-level feedback interventions combined with other agents such as opioids or antipsychotics,¹⁶ state survey or agency for long-term care facilities, infectious disease groups, rural health program, and/or communication).
- Leverage existing collaboratives or activities to inform stewardship activities or disseminate stewardship resources (e.g., Emerging Infections Program, a recent local or regional outbreak involving an antimicrobial-resistant pathogen, ongoing collaboratives involving HAI prevention or sepsis).
- Engage with healthcare systems that have a system-level centralized stewardship program to expand Core Element implementation to their outpatient clinics.

Support the Development and Implementation of Guidance and Policies

- Utilize existing national or state policies and support the development of new programs and/or policies that encourage stewardship implementation and tracking of antibiotic use to strengthen stewardship practice.
- Support One Health collaboratives to reduce the impact of antimicrobial resistance on human, animal, and environmental health. One Health collaboratives can facilitate communication and encourage identification of antibiotic stewardship best practices across settings and among multiple disciplines.¹⁷



Tracking

Measurement is critical to identify opportunities for improving prescribing practices and to assess the impact of stewardship interventions. SLHD-ASPs should monitor stewardship activities and antibiotic use data across the spectrum of health care.

- ▶ Tracking **stewardship activities** by assessing the uptake of the *Core Elements* can help identify facilities and settings that need the most support.^{18–20}
- ▶ Tracking **antibiotic use** across different healthcare settings will identify where stewardship interventions are most needed and monitor their effectiveness. For settings with limited access to antibiotic use data, SLHD-ASP can leverage stewardship collaboratives to track data at the local level, specifically emphasizing electronic tracking to minimize burden, ensure sustainability, and allow for data validation.

SLHD-ASP programs can choose different data sources to track stewardship activities and antibiotic use:

Tracking data on stewardship activities and *Core Elements* uptake

- Track the uptake of the *Core Elements* (including [Priorities for Hospital Core Element Implementation](#)) through NHSN group function and [compare to national or regional distributions](#) available on the [Antimicrobial Resistance & Patient Safety Portal \(ARPSP\)](#).

Antimicrobial Resistance & Patient Safety Portal

BE ANTIBIOTICS AWARE
SMART USE, BEST CARE

Explore and Visualize Data on Antibiotic Use and Stewardship

For more information, visit www.cdc.gov/antibiotic-use or call 1-800-CDC-INFO.

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- Engage with healthcare facilities and health systems to track and validate nationally reported *Core Elements* data.
- Review completed [Infection Control Assessment Tools](#) and other surveys²¹ to identify healthcare facilities that need stewardship technical assistance.
- Engage with state survey or agencies and review [Centers for Medicare and Medicaid Services \(CMS\) long-term care stewardship citations](#) to help long-term care facilities address gaps in their stewardship programs.
- Conduct a survey of outpatient facilities²² to assess engagement in antibiotic stewardship and uptake of the *Core Elements*.
- Evaluate stewardship programs through setting-specific assessment tools based on the implementation of activities outlined in the *Core Elements* to inform facility certificates (e.g., honor roll).

Tracking antibiotic use data

- Analyze data sources to track antibiotic use across different healthcare settings directly or through a stewardship collaborative. Antibiotic use data can be stratified by practice setting, prescriber specialty, drug or class of interest, or appropriateness of prescribing.^{15, 23} [Antibiotic use data](#) can be compared to national or regional distributions available on the ARPSP. Examples of data sources by setting include:
 - » Inpatient data sources (e.g., NHSN Antimicrobial Use and Resistance Module Standardized Antimicrobial Administration Ratio (SAAR) risk-adjusted summary measure through NHSN group function)¹³
 - » Outpatient data sources (e.g., Medicaid,^{24, 25} [All-Payer Claims Databases](#), [CMS Part D Public Use Files](#), electronic health records, proprietary data)
 - » Long-term care data sources (e.g., long-term care pharmacy transactions, electronic health record antibiotic orders/administrations)
- Assess data sources for availability of health equity-related variables that may identify disparities in antibiotic prescribing. When feasible, incorporate health equity-related variables in surveillance and data analyses at the patient, facility, and community levels.



Reporting

The SLHD-ASP should provide regular updates and summary data on stewardship activities and antibiotic use to health department leadership, local partners, stewardship collaboratives, healthcare professionals, and the public.

- ▶ Data on **stewardship activities** can be used to provide stewardship-specific feedback or certificates to healthcare facilities.
- ▶ **Antibiotic use** data can be used to provide prescriber-level feedback with peer comparisons, either directly by the SLHD-ASP or within a stewardship collaborative.

Specific examples of reporting strategies leveraging different data sources include:

- Include [data on stewardship activities and antibiotic use](#) available on the ARPSP compared to national or regional distributions in the health department annual report to leadership and partners.
- Create facility certificates (e.g., honor roll) to acknowledge success in the implementation of stewardship activities outlined in the *Core Elements* assessment tools for all settings, including [Priorities for Hospital Core Element Implementation](#).
- Share antibiotic use data tracked within stewardship collaboratives with healthcare professionals in different healthcare settings, either directly or through electronic dashboards.
- Leverage publicly available or proprietary antibiotic use data to provide prescriber-level feedback with peer comparison interventions in outpatient settings.
- Share information on health disparities related to antibiotic use identified.



Education

Providing antibiotic stewardship education to healthcare professionals and the public is a key component of comprehensive efforts to improve antibiotic use. Existing and new relationships with key community partners are important to disseminate antibiotic use education. Multifaceted educational interventions can be most effective in improving antibiotic use²⁶ and are an important part of any stewardship collaborative.

SLHD-ASPs can consider various educational strategies:

- Provide setting-specific antibiotic stewardship educational workshops (e.g., communication skills training, antibiotic use tracking, improving diagnosis and treatment of infections and [sepsis](#)). The [CDC Training on Antibiotic Stewardship](#) can be used to provide clinicians with foundational stewardship education and supplement SLHD educational workshops.



UPDATED CDC Training on Antibiotic Stewardship

To access the training and free continuing education credits, visit www.train.org/cdctrain/training_plan/3697.

- Consider focusing on outreach to healthcare professionals in rural settings where there may be limited educational resources available.
- Engage with local professional organizations to provide stewardship education.²⁷
- Offer student work study program, practicum projects, or clinical trainee rotations on public health antibiotic stewardship.
- Disseminate [healthcare professional resources](#), [Continuing Education \(CE\) and informational resources](#), and treatment guidelines as part of stewardship collaboratives.
- Develop a public communication strategy including engaging with local news channels and social media postings.
- Work with community partners, including patient advocate organizations, to disseminate public health communication and educational resources that are tailored to the community's specific needs and priorities that factor in health equity.²⁸
- Participate in [U.S. Antibiotic Awareness Week activities and events and disseminate *Be Antibiotics Aware* resources](#).
- Consider engagement with a variety of local non-healthcare-based partners to amplify messaging on improving antibiotic use (e.g., schools, public libraries, community events, and local media).

Conclusion

Public health engagement in implementation of sustainable antibiotic stewardship activities is critical to support national and local efforts to improve antibiotic use and combat antimicrobial resistance. Antibiotic stewardship is integral to healthcare quality improvement and ensures that patients receive the best treatment for infections while minimizing the risk of adverse events. SLHD-ASPs play an important role in providing access to stewardship expertise and supporting stewardship collaboratives in their jurisdictions.^{3, 4} The implementation of the *Core Elements of Antibiotic Stewardship* should be a dynamic process. Ensuring **Leadership** support, **Accountability** and **Expertise** is central to developing an effective SLHD-ASP. **Tracking** of stewardship activities and antibiotic use data and **Reporting** these data to relevant partners can inform stewardship **Education & Actions** (Figure 2). Continuous evaluation is important to assess progress and identify new stewardship activities. The expansion of SLHD-ASP will allow the identification of priority implementation strategies to inform future stewardship initiatives.



Figure 2: Core Elements of Antibiotic Stewardship

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