

Acute Care Antibiotic Stewardship Program Resource List

Hospital-based antimicrobial stewardship programs (ASPs) can reduce antibiotic resistance by using a defined, common approach towards judicious antibiotic use. Using antibiotics judiciously (i.e., using the right antibiotic, at the right dose, and for the right duration) improves clinical outcomes and reduces adverse events and resistance. Based on strong supportive evidence, Centers for Disease Control and Prevention (CDC) recommends that all acute care hospitals implement an ASP.

There is no lack of resources for implementing and sustaining acute care antibiotic stewardship programs. There are valuable toolkits, checklists, and templates to guide the health care professional or team. In fact, with so many available materials, it can be challenging for facilities to narrow the list to those which will be most useful. The list below includes some of the most current and useful tools available. A brief summary accompanies each resource so that facility staff can quickly consider its practical value in light of their own needs.

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ASP Standards and Frameworks

Approved: New Antimicrobial Stewardship Standard

(https://www.jointcommission.org/assets/1/6/New_Antimicrobial_Stewardship_Standard.pdf)

- New Medication Management Standard that addresses ASPs.
- The Joint Commission; 2017

The Core Elements of Hospital Antibiotic Stewardship Programs: Checklist

(<https://www.cdc.gov/antibiotic-use/healthcare/pdfs/checklist.pdf>)

- Checklist of the CDC Core Elements. Serves as a gap analysis tool.
- CDC; 2017

The Core Elements of Hospital Antibiotic Stewardship Programs (<https://www.cdc.gov/antibiotic-use/healthcare/pdfs/core-elements.pdf>)

- Summary of elements necessary to build a successful ASP.
- CDC; 2014

ASP Toolkits

Antimicrobial Stewardship: Implementation Tools & Resources

(<http://shea-online.org/index.php/practice-resources/priority-topics/antimicrobial-stewardship/implementation-tools-resources>)

- ASP implementation tools and resources with a focus on ready-to-use materials and forms.
- The Society for Healthcare Epidemiology of America; 2018

Implementation of Antibiotic Stewardship Core Elements at Small and Critical Access Hospitals (<https://www.cdc.gov/antibiotic-use/healthcare/pdfs/core-elements-small-critical.pdf>)

- Practical strategies for ASP implementation in small and critical access hospitals. Strategies organized by CDC AS Core Element.
- CDC, The American Hospital Association, The Federal Office of Rural Health Policy, Pew Charitable Trusts; 2017

Preventing Unnecessary Harm from Antibiotics Change Package (<http://www.hret-hiin.org/Resources/asp/17/antibiotic-stewardship-program-change-package.pdf>)

- Includes a menu of strategies, change concepts, and specific actionable items to implement based on need or for purposes of improving patient quality of life and care.
- Health Research & Educational Trust; 2017

Jump Start Stewardship: Implementing Antimicrobial Stewardship in a Small, Rural Hospital

(<https://www.doh.wa.gov/Portals/1/Documents/5600/JumpstartStewardshipWorkbook.pdf>)

- Comprehensive workbook used to support a professional training day. Includes guidance, tools, and worksheets to facilitate development of a concrete framework and strategic plan for implementing a feasible, small-scale ASP.
- The EQuIP Program: Qualis Health, Washington State Department of Health, Washington State Hospital Association, local chapters of the Association for Professionals in Infection Control; 2016

National Quality Partners Playbook: Antibiotic Stewardship in Acute Care

(https://www.qualityforum.org/Publications/2016/05/National_Quality_Partners_Playbook_Antibiotic_Stewardship_in_Acute_Care.aspx)

- Implementation examples, potential barriers and solutions, and tools and resources for each CDC AS Core Element. Includes appendix that is a comprehensive list of resource URLs organized by Core Element.
- National Quality Forum; 2016

Appropriate Use of Medical Resources: Antimicrobial Stewardship Toolkit

(<http://www.ahaphysicianforum.org/resources/appropriate-use/antimicrobial/ASP-Toolkit-v3.pdf>)

- Links to resources organized by audience: 1) Hospital and Health System Resources, 2) Clinical Resources, and 3) Patient Resources.
- American Hospital Association – Physician Leadership Forum; 2014

Antimicrobial Stewardship Toolkit: Best Practices from the GNYHA/UHF Antimicrobial Stewardship Collaborative (<https://uhfnyc.org/assets/1042>)

- Concrete tools, sample ASP models, and implementation examples from facilities participating in a New York state ASP collaborative.
- Greater New York Hospital Associations, United Hospital Fund; 2011

ASP Implementation Examples

Antibiotic Prescribing and Use in Hospitals and Long-Term Care: Stewardship Program

Examples (<https://www.cdc.gov/antibiotic-use/healthcare/programs.html>)

- U.S. hospital ASP examples and success stories by state.
- CDC; 2017

A Path to Better Antibiotic Stewardship in Inpatient Settings

(<http://www.pewtrusts.org/~media/assets/2016/04/apathtobetterantibioticstewardshipininpatientsettings.pdf>)

- Ten examples and accompanying case studies of ASP implementation.
- Pew Charitable Trusts; 2016

Hospital Antimicrobial Stewardship Program Implementation Toolkit

(https://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/ASP_ToolkitAC_examples.aspx)

- Example ASP implementation documents from California facilities organized by CDC Core Element.
- California Department of Public Health; 2015

Role of ASP Team Members

Physicians and Other Prescribers

Infectious Diseases Physicians: Leading the Way in Antimicrobial Stewardship

(<https://academic.oup.com/cid/article/66/7/995/4851152>)

- White paper intended for health care policymakers, executives, quality and patient safety leaders, and third-party payers. ID physicians possess the clinical knowledge and leadership qualities required to lead a successful ASP.
- *Clinical Infectious Diseases*, 66(7); 2018

An Infectious Diseases Physician-Led Antimicrobial Stewardship Program at a Small Community Hospital Associated with Improved Susceptibility Patterns and Cost-Savings After the First Year (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4473105/>)

- Description of an effective, physician-led ASP established in a small, 70-bed, community hospital. The physician leader (PL) established the ASP, visited weekly, reviewed all prescribed antibiotics, provided face-to-face recommendations to providers, designed order sets, and served on relevant committees. The PL was available by pager most days and made recommendations but no formal consults. The PL provided annual education.
- *Open Forum Infectious Diseases*, 2(2); 2015

Nurses

Exploring the nurses' role in antibiotic stewardship: A multisite qualitative study of nurses and infection preventionists (<https://www.ncbi.nlm.nih.gov/pubmed/29395509>)

- A qualitative study that explores the attitudes of nurses and infection preventionists toward nurse-driven antibiotic stewardship practices.
- *American Journal of Infection Control*, 46(5); 2018

Antibiotic stewardship: The role of clinical nurses and nurse educators

(<https://www.sciencedirect.com/science/article/pii/S0260691717302514>)

- An overview of nurses' roles in antibiotic stewardship, including practical examples demonstrating areas where nurses would contribute.
- *Nurse Education Today*, Volume 60; 2018

Redefining the Antibiotic Stewardship Team: Recommendations from the American Nurses Association/Centers for Disease Control and Prevention Workgroup on the Role of Registered Nurses in Hospital Antibiotic Stewardship Practices (<https://www.cdc.gov/antibiotic-use/healthcare/pdfs/ANA-CDC-whitepaper.pdf>)

- ANA and CDC White Paper that details the integral role(s) nurses play in ASPs and calls for more training and education for nurses.
- American Nurses Association (ANA), CDC; 2017

Pharmacists

Role of the Pharmacist in Antimicrobial Stewardship

(<http://www.rimed.org/rimedicaljournal/2018/06/2018-06-26-antimicrobial-fortin.pdf>)

- Highlights how pharmacists are able to enhance each element of antimicrobial stewardship.
- *Rhode Island Medical Journal*, 101(5); 2018

Pharmacist-driven antimicrobial stewardship program in an institution without infectious diseases physician support. (<https://www.ncbi.nlm.nih.gov/pubmed/25736941>)

- Pharmacist-led ASP achieved substantial reductions in antimicrobial utilization and associated expenditures.
- *American Journal of Health System Pharmacy*, 72(6); 2015

The Pharmacist' Role in Antimicrobial Resistance (https://www.pharmacists.ca/cpha-ca/assets/File/education-practice-resources/Translator%20Fall_V9_Issue3_2015.pdf)

- Summaries of four pharmacy practice articles describing the role of pharmacists in ASP.
- *The Translator* (Canadian Pharmacists Association), 9(3); 2015

ASHP Statement on the Pharmacist's Role in Antimicrobial Stewardship and Infection Prevention and Control (<https://www.ashp.org/-/media/assets/policy-guidelines/docs/statements/pharmacists-role-antimicrobial-stewardship.ashx?la=en&hash=9B62450AC29F545BB1FEF7301A89E7F0A703AC12>)

- Medication Therapy and Patient Care: Specific Practice Areas—*Statements*
- The American Society of Health-System Pharmacists; 2010

Infection Preventionists

The Infection Preventionist’s Role in Antimicrobial Stewardship Programs

(<https://www.infectioncontroltoday.com/stewardship/infection-preventionists-role-antimicrobial-stewardship-programs>)

- An overview on the infection preventionist’s role in ASP.
- *Infection Control Today*; 2017

Antimicrobial stewardship: A collaborative partnership between infection preventionists and health care epidemiologists.

(https://apic.org/Resource/TinyMceFileManager/Practice_Guidance/APIC_SHEA_Antimicrobial_Stewardship_Position_Statement.pdf)

- Position paper that highlights the critical importance of health care epidemiologists and infection preventionists in effective ASPs.
- *American Journal of Infection Control*, Volume 40; 2012

Education and Training Opportunities

CDC’s Antibiotic Stewardship Training Series (https://www.train.org/cdctrain/training_plan/3697)

- Interactive web-based activity designed to help clinicians optimize antibiotic use to combat antibiotic resistance and improve health care quality and patient safety.
- CDC; 2018

Antimicrobial Stewardship: A competency-based approach (<https://openwho.org/courses/AMR-competency>)

- Through case based examples, the course will highlight how antimicrobial stewardship principles can be applied to common clinical scenarios.
- World Health Organization (WHO); 2018

Optimizing Antimicrobial Therapy with Timeouts

(<https://med.stanford.edu/cme/courses/online/optimizing-antimicrobial-therapy.html>)

- Provides a practical approach to performing “Antibiotic Timeouts” in the inpatient setting.
- Stanford Center for Continuing Medical Education; 2017 (reviewed)

Quality and Patient Safety: Antibiotic Stewardship (<https://www.mnhospitals.org/quality-patient-safety/quality-patient-safety-initiatives/antibiotic-stewardship>)

- Minnesota Hospital Association’s (MHA) Antibiotic Stewardship webpage with link to their 2017 monthly webinar series on a variety of antibiotic stewardship topics.
- Minnesota Hospital Association; 2017

Recent Publications

Enumerating the economic cost of antimicrobial resistance per antibiotic consumed to inform the evaluation of interventions affecting their use

(https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6085682/pdf/13756_2018_Article_384.pdf)

- Describes estimates of economic evaluations that inform policy recommendations regarding interventions that affect antimicrobial use.
- *Antimicrobial Resistance & Infection Control*, 7:98; 2018

Driving sustainable change in antimicrobial prescribing practice: how can social and behavioural sciences help? (<https://www.ncbi.nlm.nih.gov/pubmed/30020464>)

- Behavioural and social sciences offer a range of theories, frameworks, methods, and evidence-based principles that can help inform the design of behaviour change interventions that are context-specific and thus more likely to be effective.
- *Journal of Antimicrobial Chemotherapy*, 73(10); 2018

The Standardized Antimicrobial Administration Ratio: A New Metric for Measuring and Comparing Antibiotic Use (<https://www.ncbi.nlm.nih.gov/pubmed/29409000>)

- The CDC's National Healthcare Safety Network (NHSN) includes a functionality enabling hospital tracking of antibiotic use levels, the Antibiotic Use Option. This paper describes the development of a NHSN metric designed to compare antibiotic use data from a single hospital with that expected from other hospitals nationwide.
- *Clinical Infectious Diseases*, 67(2); 2018

Assessing the impact of antibiotic stewardship program elements on antibiotic use across acute-care hospitals: an observational study (<https://www.ncbi.nlm.nih.gov/pubmed/29893654>)

- Key structural and strategic aspects of ASPs associated with differences in risk-adjusted antibiotic utilization across facilities.
- *Infection Control and Hospital Epidemiology*, 39(8); 2018

'Careful goodbye at the door': is there role for antimicrobial stewardship interventions for antimicrobial therapy prescribed on hospital discharge?

(<https://bmcinfectdis.biomedcentral.com/track/pdf/10.1186/s12879-018-3147-0>)

- A large discrepancy exists between antimicrobial regimens prescribed on hospital discharge and those recommended in consensus guidelines, particularly concerning duration of treatment.
- *BioMed Central Infectious Diseases*, 18:225; 2018

Towards a More "Human" Stewardship: The Sociology of Antimicrobial Prescribing

(https://www.khconline.org/files/Summit_on_Quality/2018/Keynote-Szymczak.pdf)

- Summary of the sociological factors that impact antimicrobial stewardship effectiveness.
- Keynote presentation from the 10th Annual Summit on Quality, Wichita, KS; 2018

Essential Resources and Strategies for Antibiotic Stewardship Programs in the Acute Care Setting (<https://academic.oup.com/cid/article/67/8/1168/4953703>)

- Diverse ASPs showed an independent relationship between physician and pharmacist full-time equivalent and self-reported effectiveness of ASPs.
- *Clinical Infectious Diseases*, 67(8); 2018

Effective Antimicrobial Stewardship Strategies for Cost-effective Utilization of Telavancin for the Treatment of Patients With Hospital-acquired Bacterial Pneumonia Caused by *Staphylococcus aureus* ([https://www.clinicaltherapeutics.com/article/S0149-2918\(18\)30012-2/fulltext](https://www.clinicaltherapeutics.com/article/S0149-2918(18)30012-2/fulltext))

- Modern ASP should focus on total cost of care, not simply drug acquisition costs, to take full advantage of potential clinical and economic benefits of novel antimicrobial agents.
- *Clinical Therapeutics*, 40(3); 2018

Cost-effectiveness analysis of implementing an antimicrobial stewardship program in critical care units

(<https://www.tandfonline.com/doi/abs/10.1080/13696998.2017.1311903?journalCode=ijme20>)

- Implementing an ASP focusing on critical care patients is a long-term cost-effective tool.
- *Journal of Medical Economics*, 20(6); 2017

What Is the More Effective Antibiotic Stewardship Intervention: Preprescription Authorization or Postprescription Review With Feedback?

(<https://www.ncbi.nlm.nih.gov/pubmed/27927861>)

- Comparison of days of antibiotic therapy (DOT) using preprescription authorization (PPA) vs postprescription review with feedback (PPRF) strategies. PPRF may have more of an impact on decreasing antibiotic DOTs compared with PPA.
- *Clinical Infectious Diseases*, 64(5); 2017

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