# Antimicrobial Stewardship Program (ASP) Guide for Resource-Limited Settings

Antibiotic stewardship programs aim to improve antibiotic use, improve patient outcomes, reduce costs and combat antibiotic resistance. Implementing programs in resource-limited settings is challenging for a variety of reasons, including that most guidance focuses on high-resource settings.

## Background/Rationale

- Antimicrobial stewardship (also known as antibiotic stewardship) refers to programs and activities that promote the appropriate selection and use of antibiotics.
- Stewardship activities include limiting the use of antibiotics when they are not needed and minimizing the frequency, duration and number of antibiotics prescribed.
    - Diagnostic stewardship ensures that patients get the right test at the right time. It should ensure that tests happen when needed, that specimens are collected properly and that results are given to providers in a timely manner to guide patient treatment.
- Stewardship can improve the outcomes for individuals who need antibiotics and prevent the unintended consequences of antibiotic use such as side effects, the development of antibiotic-resistant bacteria and the replacement of normal bacteria with those that cause infections, such as *C. difficile*.

Right Drug ➤ Right Dose ➤ Right Route ➤ Right Duration

## Establishing a Stewardship Program

### Form an Antimicrobial Stewardship Committee
The stewardship committee should aim to bring together the relevant stakeholders, including any personnel with infectious disease or pharmacy background/expertise. The committee is important to obtain buy-in from prescribers and staff to ensure a successful program.

Representation on this committee is fundamental to the success of the ASP. Nurses and infection control personnel are important to include since they can provide valuable linkages to other related initiatives in a facility, such as multi-drug-resistant organism or healthcare-associated infection surveillance.

### Start with a Single Priority Area of the ASP
The priority area would ideally be identified by reviewing existing data on antibiotic use or by conducting a focused needs assessment or situational analysis of antibiotic use at the facility. In the absence of data, the stewardship committee can be used to establish the priority.

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Establishing the priority should take into account existing resources, such as laboratory and pharmacy capacity. Priorities may also be focused within a specific unit or area where antibiotic use is known to be high and do not need to be facility-wide. Initial priorities might also be facility-wide but narrowly defined in terms of their scope – such as reviewing the need for antibiotics after 48 hours, especially when cultures are negative.

Examples of priorities could be:
- Reducing inappropriate use of colistin, carbapenem or 3rd generation cephalosporin antibiotics
- Improving adherence to guidelines for empiric treatment for community-acquired pneumonia or sepsis

## Ensure Appropriate Policies or Guidelines are in Place, Especially for the Priority Area
To improve antibiotic use, there should be some clinical guidance, or standard, to strive toward. In the absence of such guidance, it becomes difficult to hold prescribers accountable and encourage changes in practice. Facilities may use or adapt national, regional or local guidance if available, making modifications to meet the needs of their facility (e.g., drug availability, acuity of patients/residents/participants). Facilities may choose to start with a brief targeted document for the priority area, based on a simple adaptation of national guidelines to fit their facility.

## Educate Staff
Once a priority area is chosen and policies and guidelines are in place, frontline staff may require additional education around these guidelines. Staff education may be general or targeted, depending on the priority area chosen.

## Implement Stewardship Activities Targeted at the Priority
The designated stewardship team should choose 1-3 activities targeted at the priority area, which will comprise the core of the ASP. Starting with fewer activities and doing them well is preferable to implementing more activities, which can be difficult to execute simultaneously. Consideration should be given to what is achievable in a facility given existing strengths and resource limitations, and which activities will have the desired impact on the priority area.

## Monitoring and Evaluating Processes
A reasonable place to start is with tracking process measures. For instance, if a facility seeks to improve appropriate 3rd generation cephalosporin usage through chart audits and feedback to providers, they may want to track measures such as 'number of charts reviewed' or 'providers contacted' at some frequency (e.g., weekly). This would enable them to monitor program implementation and catch challenges or issues early in the process.

## Monitoring and Evaluating Impact

Monitoring the impact of an ASP can be extremely useful in demonstrating the effectiveness and value of a program. These are considered core elements of stewardship. A first step for facilities interested in pursuing this type of advanced monitoring and evaluation would be to set priority targets for an ASP, and monitor progress towards meeting them. An example would be tracking a particular antibiotic's usage and establishing a target (e.g., 50% reduction in carbapenem use).

Often such antibiotic use indicators are easier to implement and more likely to demonstrate successes in the short term as opposed to clinical outcomes (e.g., 50% reduction in carbapenem-resistant Enterobacteriaceae infections).

Measuring impact and outcome measures will generally require more time and effort than process measures and often requires the ability to collect real-time data on activities for feedback and action. Stewardship activities can and should still be implemented in the absence of a formal impact or outcome monitoring and evaluation schema.

Common methods to measure impact include:
- Total antibiotic use (measured as days of therapy or defined daily dose)
- Appropriateness of antibiotic selection, dose and duration (e.g., % of prescriptions that adhere to local guidelines for a given condition)
- Cost (e.g., a cost-effectiveness analysis of the program)
- Antimicrobial resistance
- Clinical outcomes (e.g., rates of *Clostridioides difficile* or methicillin-resistant Staphylococcus aureus infections)

## Tools

### Antibiotic Time Out Tool

Clinicians and teams can use the Antibiotic Time Out Tool to assess antibiotic use utilizing the *Four Moments* Framework for individuals receiving antibiotics.

#### Four Moments of Antibiotic Decision Making

| | Question | Recommendation |
|---|---|---|
| 1 | Does the individual have an infection that requires antibiotics? | Before initiating antibiotics, it is important to pause and review all relevant clinical and laboratory data and then weigh the potential benefit versus harm of initiating antibiotic therapy. |
| 2 | Have appropriate cultures been collected before starting antibiotics? | Cultures obtained before antibiotic initiation are the most useful for antibiotic selection. If an organism was recovered, use the narrowest spectrum agent expected to be effective. |
| 3 | Once antibiotics have been initiated, when can they be stopped? When can the therapy be changed from IV to oral therapy? | The need for continued antibiotic therapy should be assessed daily and can occur as early as after the first day of therapy. If there is no evidence of a bacterial infection, stop antibiotics. If clinical improvement is observed and oral antibiotic therapy can be tolerated and is appropriate for the type of infection diagnosed, transition from intravenous to oral therapy. |
| 4 | What duration of antibiotic therapy is needed for the individual's diagnosis? | Always use the shortest effective antibiotic duration for the infectious process being treated. Document the planned duration and stop date in the medical record. |

#### Stewardship Activities Checklist

| SECTION 1.  KNOWLEDGE AND COMPETENCY | | Yes | No | N/A |
|---|---|---|---|---|
| Q1 | Do nursing personnel receive periodic training or education about appropriate antibiotic use? | | | |
| Q2 | Are medical personnel given resources to help guide decisions when a patient/resident has an infection or needs an antibiotic? | | | |
| Q3 | Do patients/residents and family receive education about appropriate antibiotic use? | | | |
| SECTION 2.  INFECTION PREVENTION POLICIES AND INFRASTRUCTURE | | Yes | No | N/A |
| Q1 | Does your facility have a pharmacist or physician who provides guidance or expertise on antibiotic use? | | | |
| Q2 | Does your facility use standardized order forms for antibiotic prescriptions including documentation of indication and anticipated duration of therapy? | | | |
| SECTION 3.  MONITORING PRACTICES | | Yes | No | N/A |
| Q1 | Does the pharmacy service provide a monthly report of antibiotic use (e.g., new orders, number of days of antibiotic treatment) for the facility? | | | |
| Q2 | Does your facility have a process to perform a follow-up assessment 3 days after a new antibiotic start to determine whether the antibiotic is still indicated and appropriate? | | | |
| Q3 | Does your facility provide feedback on antibiotic prescribing practices to medical personnel? | | | |
| Q4 | Does the laboratory provide your facility with a report of antibiotic resistance in bacteria identified from cultures sent from your facility (e.g., antibiogram)? | | | |

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## Resources

- [Assessment of Current CDI Prevention Activities – Antibiotic Stewardship | QIO Program](#)
- [The Role of the Bedside Nurse in Antibiotic Stewardship Interventions | AHRQ](#)
- [The Challenges and Innovations in Antimicrobial Stewardship | LearningCE (SHEA Online Education Center)](#)
- [Create a Culture of Safety Around Antibiotic Prescribing | AHRQ](#)
- [Mindfulness: Engaging Frontline Providers in Antimicrobial Stewardship | AHRQ](#)
- [Antibiotic Stewardship Program Resources for Nursing Homes | CMS](#)
- [Antibiotic Stewardship | CDC](#)
- [Core Elements of Antibiotic Stewardship | CDC](#)
- [Core Elements of Human Antibiotic Stewardship Programs in Resource-Limited Settings | CDC](#)
- [Toolkit Implementation Guide for Acute Care Antibiotic Stewardship Programs | AHRQ](#)
- [Making Effective Behavior Changes Around Antibiotic Prescribing | AHRQ](#)
- [Learn Best Practices for the Diagnosis and Treatment of Infectious Syndromes | AHRQ](#)
- [Antimicrobial Stewardship Program Pocket Card | HQIN](#)
- [Do One Thing Differently – Targeting Antimicrobial Stewardship: IV to PO Protocol | HQIN](#)
- [ICAR Tool for General Infection and Control Across Settings - Module 10. Antibiotic Stewardship Facilitator Guide | CDC](#)