

Antimicrobial Stewardship Program strategy criteria reference guide

Public Health Ontario (PHO) has compiled 32 antimicrobial stewardship strategies that can be used to streamline and improve antimicrobial use and educate health care professionals. Health care institutions can employ these strategies to help build, grow, and enhance their antimicrobial stewardship programs (ASP).

The strategies you choose to implement at your institution will depend on local culture, needs, prescribing issues, the institution's size and patient population, levels of expertise and available resources (including personnel and staffing). Each of these strategies has been assigned criteria to help you determine what is most suitable for your facility.

Priority Rating

The priority ratings are presented in three tiers, from A to C (A being the highest priority, and C being the lowest priority) to help institutions prioritize and select from the many possible interventions. The ratings were determined by PHO's ASP team, which consists of pharmacists and physicians. The team reviewed and rated the strategies independently. They then discussed individual ratings and reached a consensus.

Priority ratings were based on the following considerations:

- Importance of the strategy for streamlining antimicrobial use in an institution.
- Whether the strategy was identified in the literature and by national organizations as fundamental to an ASP.¹⁻⁷
- Availability of evidence associated with the strategy to support the achievement of positive outcomes (for example, improvement in antimicrobial use or patient outcomes).
- Whether the strategy is a suggested intervention by Accreditation Canada.⁸
- Whether the strategy can be applied broadly or adapted for hospitals of various sizes with various resources.^{6,7}

Difficulty Rating

Difficulty is rated from 1 to 3 (1 being the most straightforward to implement and 3 the most difficult). The difficulty ratings are based on ease of implementation and sustainability of the strategy. Strategies with higher difficulty ratings require more resources and/or expertise to implement and often require dedicated personnel for ongoing execution.

PHO's ASP team established the difficulty rating using a process similar to the one used for priority rating – independently rating the strategies, then developing consensus.

- **Level 1** includes strategies that require the least time and fewest resources to develop, introduce or perform.
- **Level 2** includes strategies that may involve a more coordinated, multidisciplinary effort to implement and evaluate, and/or they may require regular monitoring.
- **Level 3** includes strategies that are more labour- or resource-intensive to implement, require ongoing resources to perform or sustain, and/or require expertise that may not be available in all institutions.

The difficulty of implementing each strategy will vary by institution depending on resources, computer interfaces and system capabilities for generating reports and identifying patients for review, and relationships with other departments such as the microbiology laboratory. For example, the strategies “De-escalation and streamlining” and “Identification of inappropriate pathogen/antimicrobial combination (“bug-drug mismatch”)” may be easier to implement when computer capabilities and interdepartmental relationships already exist. Still, because such interventions require personnel to review orders and intervene on an ongoing basis, both strategies were given a difficulty level of 3.

PHO core strategy

Six of the 32 strategies have been designated “PHO Core Strategies”. The process and considerations in selecting the core strategies was similar to the priority ratings. The ‘Core’ designation identifies strategies that the PHO ASP team considers important foundations of an institutional ASP. They serve as a suggested starting point for institutions building their ASP; and are highly suggested strategies for all institutions.

It is important to note that PHO did not critically review all evidence and/or perform a systematic review to inform the priority level and core designation.

The priority rating and the PHO core strategy designation do *not* indicate that an institution is required to implement these strategies. Institutions are free to choose strategies that best fit with their needs and resources. Ratings are provided as a guide only, to help institutions prioritize stewardship activities.

Program stage

Antimicrobial stewardship program stages are represented by three categories: Early, Intermediate, and Advanced.

The program stage for each strategy was determined by ranking the strategies based on the difficulty and priority ratings, and whether or not it was a PHO Core strategy. They were then placed into one of the three stages (Early, Intermediate or Advanced) and reviewed and discussed by PHO's ASP team until a consensus was reached. Emphasis was given to the difficulty ratings to ensure ease of implementation for the ‘Early’ stage.

Evidence to support specific antimicrobial stewardship outcomes (5 categories)

PHO used systematic reviews^{1,9-21} to evaluate the evidence for outcomes related to the antimicrobial stewardship strategies. The outcomes have been divided into five categories:

1. Drug utilization outcomes (for example, reduction in antimicrobial consumption and/or expenditure)
2. Prescribing outcomes (for example, improved adherence to prescribing guidelines, improved 'appropriate' prescribing)
3. Clinical outcomes (for example, length of hospital stay, mortality)
4. Reduction of *Clostridium difficile* infection
5. Reduction in antimicrobial resistant organisms

A strategy may not have any outcomes listed if the intervention was not studied, it did not positively influence the outcome, or if particular studies of the intervention were not included in the systematic reviews based on criteria or publication date. Please refer to specific reviews for the inclusion criteria for individual studies.

Keep the following in mind when interpreting the evidence:

1. Systemic reviews identified that overall, the quality and strength of evidence is low (particularly for clinical outcomes).
2. The magnitude of the effect of a stewardship strategy on a given outcome varies amongst studies and in some cases results may be weak or conflicting.
3. Many studies assessed in the reviews involve interventions specific or limited to certain target antimicrobials, or certain types of infections. For example, the majority of the clinical outcome data for 'Parenteral to oral (IV to PO) conversion' and 'Disease specific treatment guidelines/pathways/algorithms and/or associated order forms' relates to respiratory tract infections.
4. Many studies in the reviews involved more than one stewardship intervention, making it difficult to attribute effects to specific interventions.
5. The majority of the studies involved single centres.
6. Heterogeneity was observed among the included studies in:
 - a) Study type
 - b) Population
 - c) Setting
 - d) Stewardship intervention
 - e) Duration of study
 - f) Outcomes assessed
 - g) Degree of bias
7. Outcomes may not be generalizable to all practice and resource settings.
8. There is little data on the sustainability of strategies.
9. There is limited data on the overall cost/benefit ratio of ASPs (for example, the cost to run a program vs. global hospital costs).
10. Overall, no harms related to stewardship interventions were observed in the studies.

References

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