Antimicrobial Stewardship Strategy: Prospective audit with intervention and feedback

**Description**

Prospective audit with intervention and feedback involves the assessment of antimicrobial therapy by trained individuals (usually physicians and/or pharmacists), who make recommendations to the prescribing service in real time when therapy is considered suboptimal.

Audits are often performed by trained pharmacists (infectious disease training is preferred but not essential\(^1,2\)), ideally with physicians who have infectious disease expertise available for consultation on more complex cases.

It is important for pharmacists to have physician support, particularly at the beginning of a program and if the prescribers are unfamiliar with the antimicrobial stewardship pharmacist. This will help improve recommendation uptake by prescribers and increase pharmacist credibility. Physician support can include:

- Introduction of the antimicrobial stewardship program pharmacist to prescribers.
- Being readily available to the pharmacist for consultation and to meet with prescribers when required.
- Reinforcing pharmacists’ recommendations.

The frequency of reviews will depend on staffing levels and can range from daily to weekly.

*For more information on these criteria and how they were developed, please see the [Antimicrobial Stewardship Strategy Criteria Reference Guide](#).*
Program design can vary with respect to who performs the audits/provides feedback, when it is done, how often it is done, and for which patients it is performed. Options for patient selection can be based on one or more of the following criteria:

- Certain infectious conditions.
- Patient location or ward (e.g., intensive care unit) or admitting service (e.g., medicine, surgery, critical care).
- Specific antimicrobial agents (e.g., broad-spectrum, restricted, potentially toxic, high-use or documented or possible misuse, and/or costly antimicrobials. Common examples include vancomycin, carbapenems, linezolid, and piperacillin/tazobactam).
- Duration of therapy; common options include new antimicrobial prescriptions, specific days of therapy (e.g., day 3 or 7) or longer durations (e.g., day 7 or 10).
- Patients at high risk of complications (e.g., for *Clostridium difficile* infection).

Strategies for communication with prescribers can vary: ad hoc face-to-face or phone conversations, regularly scheduled stewardship rounds, and/or notes or consults in the chart.

There is variation in institutions’ practice related to the documentation and permanency of recommendations made by the stewardship team in charts; no standard exists.

**Advantages**

- One of the two core stewardship strategies recommended in the Infectious Diseases Society of America/Society for Healthcare Epidemiology of America guidelines.\(^3\)
- Has been shown to decrease unnecessary or inappropriate use of antimicrobials.
- Can be initiated as part of a physician’s or pharmacist’s current scope of practice without creating new protocols or guidelines.
- May be more acceptable to prescribers than restriction-based strategies, because it does not impede initiation of therapy and prescribers can choose whether or not to implement recommendations.
- May take place throughout the course of the patient’s therapy and thus may impact many aspects of optimizing antimicrobial therapy such as duration, intravenous to oral conversion, de-escalation/streamlining, etc.
- Feedback component provides education to prescribers.
- Implementation is flexible, and the approach can be adapted to an institution’s resources and antimicrobial issues.

**Disadvantages**

- Resource-intensive: staffing and time for review and communication of recommendations.
- Suggestions may not be accepted, which may reduce impact.
- Acceptance of suggestions may be affected by who gives the recommendation (e.g., higher likelihood of acceptance from a physician vs. a pharmacist and/or if the individual known to the prescriber).
- Uptake of recommendations may be slow until prescribers become familiar with and confident in stewardship personnel.
Physician staff may be reluctant to advise on other physicians’ patients or on patients they have not personally assessed.

Prescribers may be concerned about liability related to acceptance or non-acceptance of recommendations made by stewardship personnel.

Requirements

- Dedicated staff to perform audit and feedback.
- Information technology resources (ideally automated) to identify the target population for review.
- Information management resources to efficiently document in a readily retrievable format for continuous assessment/follow-up.

Associated Metrics

- Measures of drug utilization (defined daily dose, days of therapy) and/or cost of all or targeted antimicrobials, duration of intravenous antimicrobials.
- Types of recommendations made by the antimicrobial stewardship program (e.g., changing dose or duration, de-escalation/streamlining, discontinuation).
- Acceptance rate of recommendations.

References


Additional Useful References

Select articles to provide supplemental information and insight into the strategy described and/or examples of how the strategy was applied; not a comprehensive reference list. URLs are provided when materials are freely available on the Internet.

  
  *Detailed review of prospective audit and feedback programs.*

  *Assessed the impact of audit and feedback performed by a stewardship pharmacist on quality indicators of antimicrobial use.*

  *Targeted patients receiving anti-pseudomonal beta-lactams, fluoroquinolones, vancomycin, linezolid and aminoglycosides.*


  *Contains sample flowsheet that may be used to guide prospective audit and feedback.*

### Samples/Examples

- **Example 1:** Markham Stouffville Hospital Corporation - Antimicrobial Stewardship Team Suggestions Template
- **Example 2:** Royal Victoria Regional Health Centre - Patient Care System ASP Documentation Template
- **Example 3:** Royal Victoria Regional Health Centre - Antimicrobial Stewardship Team Chart Suggestion Stamp
- **Example 4:** The Scarborough Hospital - ICNet System Sample Report of Patients Ordered Antimicrobials for a Selected Unit
- **Example 5:** The Scarborough Hospital - ICNet System Sample Automated Alerts
- **Example 6:** ASPIRES, Quality and Patient Safety, Vancouver Coastal Health – Target Drug Report
- **Example 7:** Peterborough Regional Health Centre - ASP Intervention Documentation Record

*These documents have been generously shared by various health care institutions to help others develop and build their antimicrobial stewardship programs. We recommend crediting an institution when adopting a specific tool/form/pathway in its original form.*

*Examples that contain clinical or therapeutic recommendations may not necessarily be consistent with published guidelines, or be appropriate or directly applicable to other institutions. All examples should be considered in the context of the institution’s population, setting and local antibiogram.*

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Links with Other Strategies

- Checklists
- De-escalation and streamlining
- Disease-specific treatment guidelines, pathways, algorithms and/or associated order forms
- Dose optimization
- Intravenous to oral conversion
- Prescriber education
- Scheduled antimicrobial reassessments (“antibiotic time outs”)
- Therapeutic drug monitoring (with feedback)

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Citation


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For further information


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Public Health Ontario acknowledges the financial support of the Ontario Government.
Example 1: Markham Stouffville Hospital Corporation - Antimicrobial Stewardship Team Suggestions Template

<table>
<thead>
<tr>
<th>MARKHAM STOUFFVILLE HOSPITAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Markham Site □ Uxbridge Site</td>
</tr>
</tbody>
</table>

Antimicrobial Stewardship Team Suggestions

| Allergies: |
| NKA |
| Case reviewed on: | Presumptive diagnosis: |

Based on information available in Meditech PCI and the patient’s paper chart, we suggest the following modifications to your patient’s antimicrobial therapy:

<table>
<thead>
<tr>
<th>Agree</th>
<th>No</th>
<th>Comments/Changes</th>
</tr>
</thead>
</table>

These changes are recommended based on:

| □ Culture/sensitivity Data: |
| □ Cost effective/narrower spectrum antimicrobial regimen |
| □ Side effects/adverse reactions/drug interactions |
| □ Guidelines/best practices |
| □ Other: |

| Specific diagnosis |
| Adequate treatment duration |
| Excellent PO bioavailability |
| Optimize dosage regimen |

Current and Past Antimicrobial Therapy

<table>
<thead>
<tr>
<th>Drug Regimen</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
</table>

Completed by: | Date/Time: | Physician signature: | Date: |

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Example 2: Royal Victoria Regional Health Centre - Patient Care System ASP Documentation Template

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Example 3: Royal Victoria Regional Health Centre - Antimicrobial Stewardship Team Chart Suggestion Stamp

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Example 4: The Scarborough Hospital - ICNet System Sample Report of Patients Ordered Antimicrobials for a Selected Unit

Sample report of patients currently on an antimicrobial for a selected unit.

![Antimicrobial Use Report](image)

| Patient | Age | Medication                  | Prescription start date | Prescription end date | Days on prescription | Ordering physician | MRP | MRP Specialty | Unit       | Inpatient | Last MRP | Last Room | Last Bed | 95% |
|---------|-----|-----------------------------|-------------------------|-----------------------|----------------------|---------------------|-----------------|-----|--------------|------------|-----------|----------|-----------|---------|-----|
| 01      |     | CefTRIAXone 2500 MG VIAL (Fortar) | 25-Oct-2015 14:00      | 28-Oct-2015 14:01    | 0                    |                     |                 |    |              |            |           |          |           |         |     |
| 02      |     | CefTRIAXone 1000 MG VIAL (Bisoptin) | 23-Oct-2015 22:00      | 28-Oct-2015 22:00    | 2                    |                     |                 |    |              |            |           |          |           |         |     |
| 03      |     | MerbINDAZOLE 1500 MG/150 ML. (Dipes) | 23-Oct-2015 22:00      | 30-Oct-2015 14:00    | 3                    |                     |                 |    |              |            |           |          |           |         |     |
| 04      |     | EtaPasen 1 g inj             | 22-Oct-2015 18:00      | 26-Oct-2015 23:00    | 3                    |                     |                 |    |              |            |           |          |           |         |     |
| 05      |     | CEPUROXIME AEXTN. 500 MG TAB (Cefoxin) | 24-Oct-2015 09:00      | 28-Oct-2015 21:01    | 2                    |                     |                 |    |              |            |           |          |           |         |     |
| 06      |     | AZITHROMYCIN 250 MG TAB (Zithromax) | 25-Oct-2015 12:00      | 28-Oct-2015 12:01    | 1                    |                     |                 |    |              |            |           |          |           |         |     |

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Example 5: The Scarborough Hospital - ICNet System Sample Automated Alerts

Sample Automated Email Alerts for +ve cultures or drug levels that exceed a predefined level

Other alerts (browser view)

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Example 6: ASPIRES, Quality and Patient Safety, Vancouver Coastal Health – Target Drug Report

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### Example 7: Peterborough Regional Health Centre - ASP Intervention Documentation Record

[Table]

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