Antimicrobial Stewardship Strategy: De-escalation and streamlining

Changing broad-spectrum or multiple antimicrobials to narrow or target therapy, or discontinuing antimicrobials based on culture and susceptibility results.

@istock.com/georgemuresan

Priority Level: **B**

Difficulty Level: **3**

Program Stage:

- Early
- Intermediate
- ✓ Advanced

Antimicrobial Stewardship Outcomes:

- Drug utilization outcomes
- Prescribing outcomes
- Clinical outcomes

For more information on these criteria and how they were developed, please see the Antimicrobial Stewardship Strategy Criteria Reference Guide.

Description

This is an overview and not intended to be an all-inclusive summary. As a general principle, patients must be monitored by the health care team after changes to therapy resulting from recommendations made by the antimicrobial stewardship team.

Although it is often necessary to initiate a broad-spectrum antimicrobial regimen in patients with severe sepsis, continuing an overly broad regimen contributes to antimicrobial resistance and does not improve patient outcomes.

The terms *de-escalation* and *streamlining,* describe the practice of using culture results as a basis for switching from broad-spectrum or multiple antimicrobials to more narrow-spectrum or targeted therapy. It may also include changing administration from the intravenous to the oral route, or discontinuing antimicrobials if infection has been ruled out.

De-escalation and streamlining may also include narrowing the antimicrobial selection when cultures are negative. For example, if a patient is receiving antimicrobial therapy for *Pseudomonas aeruginosa* and it is not identified in cultures, de-escalation to an agent without activity against *Pseudomonas aeruginosa* is usually appropriate. Also, if a patient is empirically started on vancomycin specifically for methicillin-resistant *Staphylococcus aureus* and it has not been cultured, it would be reasonable to discontinue (or substitute) the vancomycin.

Other examples include changing ceftriaxone to penicillin for a susceptible *Streptococcus pneumoniae* isolate, vancomycin to cloxacillin for methicillin-susceptible *Staphylococcus aureus*, or ciprofloxacin to ampicillin for cystitis caused by a susceptible *Escherichia coli*.

De-escalation and stopping dual coverage (e.g., changing from combination therapy to monotherapy) based on microbial susceptibilities is supported by most guidelines and for most conditions.

De-escalation and streamlining are an important part of audit and feedback, but can also be implemented as a separate stewardship intervention by systematically reviewing culture results and patients' indications for therapy. References below support the safety of this approach.

Advantages

- Can decrease antimicrobial exposure and costs.[1]
- Uses reports that are already generated by the microbiology laboratory.
- Allows for discontinuation of potentially toxic antimicrobials (e.g., vancomycin, aminoglycosides) and use of agents with a better safety profile.

Disadvantages

- Recommendations to de-escalate treatment may not be accepted because of physicians' reluctance to change therapy if the patient is improving, regardless of culture results.
- The ability to assess a patient's therapy for de-escalation and streamlining depends on appropriate initial cultures being performed.

Requirements

- Staff resources to review microbiology reports and make recommendations.
- Timely access to microbiology reports.

Associated Metrics

- Measures of drug utilization (defined daily dose, days of therapy) and/or cost of antimicrobials (especially broad-spectrum agents).
- Acceptance rate of recommendations.
- Time to targeted therapy.

References

1. Dellit TH, Owens RC, McGowan JE Jr, Gerding DN, Weinstein RA, Burke JP, et al. Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America guidelines for developing an institutional program to enhance antimicrobial stewardship. Clin Infect Dis. 2007;44(2):159–77. Available from: http://cid.oxfordjournals.org/content/44/2/159.long

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.

- Masterton RG. Antibiotic de-escalation. Crit Care Clin. 2011;27:149–62.
- Tamma PD, Cosgrove SE, Maragakis LL. Combination therapy for treatment of infections with gram-negative bacteria. Clin Microbiol Rev. 2012 Jul;25(3):450–70. Available from: http://cmr.asm.org/content/25/3/450.long

  Reviews the theory and evidence behind combination antimicrobial therapy for Gram-negative infections. Concluded that combination treatment is indicated empirically, but de-escalation to monotherapy can offer the same or better outcomes in most situations.

- Garnacho-Montero J, Escoresca-Ortega A, Fernández-Delgado E. Antibiotic de-escalation in the ICU: how is it best done? Curr Opin Infect Dis. 2015;28(2):193–8.

  Reviews how de-escalation has been used in an intensive care unit without adversely affecting mortality.

Links with Other Strategies

- Improved diagnostics
- Intravenous to oral conversion
- Promotion of timely and appropriate microbiologic sampling
- Prospective audit withintervention and feedback
- Scheduled antimicrobial reassessments (“antibiotic time outs”)
- Targeted review of patients with bacteremia/fungemia

Disclaimer

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For further information

Antimicrobial Stewardship Program, Infection Prevention and Control, Public Health Ontario.

Email: asp@oahpp.ca

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