Kentucky Antimicrobial Stewardship Innovation Consortium

Educational Pearl

Defining De-Escalation

Antimicrobial de-escalation is a primary antimicrobial tool to prevent the emergence of drug-resistant bacteria. What does antimicrobial de-escalation mean when treating patients empirically?

How do guidelines define antimicrobial de-escalation?

According to the European Society of Clinical Microbiology and Infectious Disease, antimicrobial de-escalation is:

- Replacing broad-spectrum antimicrobial agents to a narrower spectrum, or
- Stopping an antimicrobial agent in combination therapy

Antimicrobial de-escalation can be targeted based on culture and susceptibilities or empirically in some culture-negative cases. See the table below for general groupings of antibiotic spectrum based on activity against gram-negative bacteria. Discontinuation of all antimicrobial agents after ruling out infection is not antimicrobial de-escalation.[1] In patients who are clinically improving after 2-4 days of empiric therapy, it is appropriate to consider antimicrobial de-escalation.[2-3]

Narrow Spectrum	Medium Spectrum	Broad Spectrum
Penicillin	Amoxicillin-clavulanate/ ampicillin-sulbactam	3rd/4th generation cephalosporins
1st/2nd generation cephalosporins	Aminoglycosides	Piperacillin/tazobactam
Nitrofurantoin	Tetracyclines	Carbapenems
Clindamycin	Macrolides	Fluoroquinolones
Vancomycin	Trimethoprim/sulfamethoxazole	Aztreonam

Which patients qualify for antimicrobial de-escalation? What about critically ill or immunocompromised patients?

Antimicrobial de-escalation is appropriate in clinically improving patients – even for those who are in the intensive care unit (ICU) or neutropenic. [2-3] Studies have shown that de-escalation in these populations does not increase the risk of worse outcomes. Instead, many retrospective studies show that de-escalation is associated with a decreased risk of acute kidney injury, ICU admission, in-hospital mortality, as well as cost-saving opportunities.[4-5]

Key Takeaway: Antimicrobial de-escalation is appropriate to consider in any clinically improving patient after 2-4 days of empiric therapy and is associated with positive patient outcomes.

References:

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