

Surgical Intensive Care Unit Antibiotic Stewardship Guideline

Purpose: To promote appropriate use of antimicrobials and decrease microbial resistance in the surgical intensive care unit (SICU)

Antibiotic Stewardship Program Components

1. Antibiotic Prophylaxis
 - All antibiotic prophylaxis will be discontinued \leq 24 hours post operatively
 - Use narrowest spectrum antibiotics based on type of surgery
2. Empiric Antibiotic Protocols
 - Indication specific empiric antibiotic therapy
 - Empiric antibiotics driven by unit data and hospital antibiogram
 - Evidence-based antibiotic treatment durations
3. Narrowing of Antimicrobial therapy
 - De-escalate therapy as soon as possible based on culture results

Staphylococcus Nasal Colonization Testing

All patients suspected of having an intraabdominal infection should have the “PCR staph nasal colonization” nasal swab completed upon admission to the SICU. If a patient has already completed the nursing intranasal decolonization, the staphylococcus PCR will not be accurate and does not need to be collected. If the staphylococcus PCR nasal swab does not detect methicillin-resistant staphylococcus aureus, vancomycin can be discontinued unless there is another indication for vancomycin.

Empiric Antimicrobial Guideline

Empiric antimicrobials should be ordered through the adult inpatient sepsis order panel. Dosing guidance for the antimicrobials can be found in appendix A of this document.

| 1. Assess for Multidrug-Resistant Organisms (MDRO) | | |
|--|---|---|
| MDRO Risk Factors Immunocompromised Solid organ transplant Recent culture with MRDO Extensive healthcare exposure or broad-spectrum antibiotic exposure in the past 90 days | MRSA Risk Factors Immunocompromised Nasal colonization positive Previous culture with MRSA Extensive healthcare exposure in the past 90 days | Fungal Risk Factors Upper GI or proximal small bowel perforation Recurrent bowel perforations Surgically treated pancreatitis Immunocompromised Candida growth on culture or known colonization |

2. Determine Source of Infection & Choose Antimicrobial(s)

| | | |
|-------------------------|----------------------|---|
| Abdominal | High Risk MDRO | <ul style="list-style-type: none"> January-June: Piperacillin-tazobactam ± fluconazole July-December: Cefepime* AND metronidazole AND vancomycin ± fluconazole Severe penicillin allergy**, <i>E. cloacae</i>, or ESBL isolated: Meropenem ± fluconazole |
| | Low Risk MDRO | <ul style="list-style-type: none"> Ceftriaxone AND metronidazole Levofloxacin AND metronidazole |
| Bacteremia | N/A | <ul style="list-style-type: none"> January-June: Piperacillin-tazobactam AND vancomycin ± fluconazole July-December: Cefepime AND metronidazole AND vancomycin ± fluconazole Severe penicillin allergy**: Meropenem AND clindamycin AND vancomycin |
| Pneumonia | High Risk MDRO | <ul style="list-style-type: none"> January-June: Cefepime AND vancomycin July-December: Piperacillin-tazobactam AND vancomycin Severe penicillin allergy**, <i>E. cloacae</i>, or ESBL isolated: Meropenem ± fluconazole |
| | Low Risk MDRO or CAP | <ul style="list-style-type: none"> Ceftriaxone AND Azithromycin Levofloxacin |
| Urinary | High Risk MDRO | <ul style="list-style-type: none"> Piperacillin-tazobactam |
| | Low Risk MDRO | <ul style="list-style-type: none"> Ceftriaxone |
| Necrotizing Soft Tissue | N/A | <ul style="list-style-type: none"> Piperacillin-tazobactam AND clindamycin AND vancomycin Severe penicillin allergy**: Meropenem AND clindamycin AND vancomycin |

*Cefepime does not cover *enterococcus*. When using cefepime for an intraabdominal infection, vancomycin should be added for *enterococcus* coverage.

**Severe penicillin allergy = anaphylaxis, face and or throat swelling, shortness of breath, and hives

Treatment Duration

Intraabdominal infections

- 96 hours from source control

Pneumonia

- Community-acquired (CAP): 5-7 days
- Hospital-acquired (HAP): 7 days

Bacteremia

- Duration is highly dependent on the source of infection and isolated bacteria
- Infectious diseases must be consulted for all *staphylococcus aureus* and yeast isolated in blood cultures

Urinary infections

- Pyelonephritis: 10-14 days
- Catheter-associated: 7 days
 - May consider 10-14 days for patients who have a delayed response to treatment
 - May consider 5 days if using levofloxacin and the patient is not severely ill

Necrotizing soft tissue infections

- Fournier’s gangrene: reference Fournier’s Gangrene Guidelines on MDSCC website (https://www.vumc.org/trauma-and-scc/sites/default/files/public_files/Manual/Fournier%27s%20Gangrene%20Guidelines.pdf)
- Necrotizing fasciitis: Antibiotics should be continued for a minimum of 7 days. Patients should have source control, hemodynamic stability, and improving signs of infection before discontinuation of antibiotics.

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Appendix A: Antimicrobial Dosing

| | Creatinine Clearance (ml/min) | | | | | |
|---|--|-------------|---------------------------------|-----------------------|----------------------|--------------------------------|
| | > 60 | 59-50 | 49-30 | 29-10 | <10 or HD | CRRT |
| Cefepime | 2000mg Q8h | 2000mg Q12h | | 2000mg Q24h | 1000mg Q24h | 2000mg Q12h |
| Ceftriaxone | Pneumonia: 2g Q24h; UTI: 1g Q24h | | | | | |
| Clindamycin | 900mg Q8h | | | | | |
| Fluconazole | 800mg x 1 dose then 400mg Q24h | | 400mg x 1 dose, then 200mg Q24h | | | 800mg x 1 dose then 400mg Q24h |
| Levofloxacin | 750mg Q24h | | 750mg Q48h | 750mg x 1, 500mg q48h | 750mg x1, 500mg q48h | 500mg Q24h |
| Meropenem | 1000mg Q8h | | | 1000mg Q12h | 1000mg Q24h | 1000mg Q8h |
| Metronidazole | 500mg Q8h | | | | | |
| Piperacillin-Tazobactam | 3.375mg Q8h | | | 3.375mg Q12h | | 3.375mg Q8h |
| Vancomycin | Use dosing panel in Epic for first dose and consult pharmacy | | | | | |
| Dosing recommendations are for severe, life-threatening infections. Please refer to infection site specific dosing recommendations in Lexicomp for more detailed information. | | | | | | |