

**VANDERBILT UNIVERSITY MEDICAL CENTER  
DIVISION OF TRAUMA, BURNS AND SURGICAL CRITICAL CARE**

**TRAUMA ANTIBIOTIC STEWARDSHIP PROGRAM:**

The Division of Trauma and Surgical Critical Care employs aggressive infection reduction and antibiotic stewardship practices. Such practices have resulted in a dramatic reduction in multidrug resistant pathogens, a significant increase in the percentage of pathogens that are pan-sensitive, and a significant reduction in broad spectrum antibiotic use per patient day<sup>1,2</sup>.

**Components of Antibiotic Stewardship Program:**

**Antibiotic prophylaxis protocols**

(< 24hrs - narrow spectrum Rx)

- Perioperative abdominal trauma
- Orthopedic fractures
- Craniofacial trauma

**Empiric antibiotic protocols**

- Empiric Rx directed by unit specific infection data
- Indication specific empiric antibiotic therapy
  - Pneumonia – early & late onset
  - Non-pneumonia – sepsis due to hospital-acquired infection from a non-pneumonia source (blood stream, surgical site, intra-abdominal, or unknown)\*
- De-escalation therapy
- Evidence based antibiotic treatment duration

**Guideline driven diagnosis of hospital infections**

- Quantitative BAL for diagnosis of VAP
  - Quantitative culture  $\geq 10^4$  CFU/mL
- Targeted empiric therapy – only when suspected source identified

**Quarterly antibiotic rotation** – class elimination and maintenance of antibiotic heterogeneity

\*Simple urinary tract infections are not included in this empiric protocol.

Overall approach: limit prophylactic exposure to appropriate indications with the narrowest appropriate spectrum and duration supported by literature, aggressively empirically cover likely pathogens for suspected infections, de-escalate therapy based on cultures, and limit therapy to evidence based durations. The Division maintains an antibiotic rotation program designed to eliminate an antibiotic class each quarter, while maintaining heterogenic use of other classes.

**Trauma Antibiotic Rotation Schedule:**

	Pneumonia (hospital day 1-3) <sup>a</sup>	Pneumonia (hospital day $\geq 4$ ) <sup>b</sup>	Non – pneumonia <sup>c</sup>	Excluded
1 <sup>st</sup> quarter	Ceftriaxone	Levofloxacin/Tobramycin	Cefepime / metronidazole	BLIC
2 <sup>nd</sup> quarter	Ceftriaxone	Meropenem	Piperacillin/tazobactam	FQ
3 <sup>rd</sup> quarter	Levofloxacin	Cefepime	Levofloxacin / metronidazole	CARB
4 <sup>th</sup> quarter	Levofloxacin	Piperacillin/tazobactam	Meropenem	3/4 CEPH

<sup>a</sup> Pneumonia occurring hospital days 1-3 are considered early-onset hospital acquired pneumonia, unless specific symptoms indicating community-acquired pneumonia (CAP) are present prior to admission. If CAP is suspected, consider adding azithromycin to ceftriaxone and ampicillin/sulbactam to levofloxacin, depending on the rotation quarter.

<sup>b</sup> Empiric coverage includes vancomycin until culture data is available for the pneumonia hospital day  $\geq 4$  and non-pneumonia protocols. Based on unit-specific data, empiric double coverage with tobramycin for late onset hospital acquired pneumonia (hospital day  $\geq 4$ ) will be used during the 1<sup>st</sup> quarter only (levofloxacin).

<sup>c</sup> Vancomycin included except in secondary peritonitis. Fluconazole included for high risk patients & tertiary peritonitis

**Administration:** The Antibiotic Stewardship Program is under the direction of Addison May and Susan Hamblin, PharmD.

#### References

1. Dortch MJ, Fleming SB, Kauffmann RM et al. Infection reduction strategies including antibiotic stewardship protocols in surgical and trauma intensive care units are associated with reduced resistant gram-negative healthcare-associated infections. *Surg Infect (Larchmt)* 2011; 12:15-25.
2. May AK, Fleming SB, Carpenter RO et al. Influence of broad-spectrum antibiotic prophylaxis on intracranial pressure monitor infections and subsequent infectious complications in head-injured patients. *Surg Infect (Larchmt)* 2006; 7:409-417.

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