**Trauma Center Practice Management Guideline**

*Iowa Methodist Medical Center — Des Moines*

**Critical Care Ventilator-Associated Pneumonia Clinical Pathway**
IMMC/ILH Adult Critical Care Areas

<table>
<thead>
<tr>
<th>ADULT Practice Management Guideline</th>
<th>Effective: 06/2014</th>
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<tr>
<td>Contact: Trauma Center Medical Director/ Trauma Nurse Practitioner</td>
<td>Last Reviewed: 06/2014</td>
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Clinical suspicion of VAP
New/progressive radiographic infiltrate plus 2 of 3 clinical features:
Temp >38°C, leukocytosis or leukopenia, and purulent sputum

- Chest X-ray
- Blood cultures x 2 from separate sites
Obtain LOWER RESPIRATORY TRACT sample for quantitative culture (ET tube cultures are not appropriate for diagnosis of VAP):
- Bronchoalveolar lavage and/or
- Protected specimen brush (bronchoscopically directed)

NOTE: If clinically unstable, start antibiotic(s) at optimal dose(s) even if cultures are not performed yet.

Begin Empiric Treatment**

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<tr>
<th>TRAUMA &lt; 7 days and no risk factors</th>
<th>MED/SURG &lt; 5 days and no risk factors</th>
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<td>(NOTE: See back of form for risk factors)</td>
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- ceftriaxone (Rocephin) 2 grams IV daily**

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<tr>
<th>TRAUMA ≥ 7 days or ≥ 1 risk factor</th>
<th>MED/SURG ≥ 5 days or ≥ 1 risk factor</th>
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- piperacillin/tazobactam (Zosyn) 3.375 grams IV q8h** – extended infusion over 4h (for patients with non-severe PCN allergy, start cefepime 2 grams IV q12h**)

AND
- vancomycin per pharmacy protocol**, goal trough = 15-20 mcg/mL
- [consider linezolid (Zyvox 600 mg IV q12h in patients with CrCl <30 mL/min]
- +/-
- tobramycin 7 mg/kg IV daily** OR
- levofloxacin 750 mg IV daily

REASSESS antibiotic therapy and patient clinical response at 48-72 hours
- De-escalate antibiotic therapy based on culture results & clinical response.
- Recommend duration of therapy = 7-10 days (may consider extending duration to 14 days for *Pseudomonas* or *Acinetobacter* infections.
- Refer to back of this form for further recommendations.

*Pharmacy to perform pharmacokinetic/pharmacodynamics (PK/PD) analysis and provide recommendations if indicated based on organism cultured.

**Pharmacy will adjust does if indicated based on renal function and will manage vancomycin and tobramycin per protocol, unless otherwise indicated.
**RISK FACTORS for Multidrug-resistant Pathogens:**
- Antimicrobial therapy in preceding 90 days
- Current hospitalization of 5 days or more (exception per this protocol is trauma patients)
- High frequency of antibiotic resistance in the community or in the specific hospital unit
- Presence of risk factors for HCAP:
  - Hospitalization for 2 days or more in the preceding 90 days
  - Residence in a nursing home or long-term care facility
  - Home infusion therapy
  - Chronic dialysis within 30 days
  - Home wound care
  - Family member with multidrug-resistant pathogen
- Immunosuppressive disease and/or therapy

**ANTIBIOTIC considerations:**
- Empiric regimens to include a different antibiotic class than the patient has already received.
- PENICILLIN ALLERGIC PATIENTS: Consider Aztreonam or Meropenem or contact the pharmacy for consultation for severe allergy; otherwise begin cefepime as indicated on protocol for non-severe reactions.
- De-escalation to occur in accordance with algorithm below, to more narrow spectrum antibiotic per microbiologic and/or PK/PD data, if available.
- Consider combination antibiotic therapy for SPACE bugs (Serratia, Pseudomonas, Acinetobacter, Citrobacter, Enterobacter species).
  - Combination should include a beta-lactam and either an aminoglycoside or quinolone.
  - Second agent (aminoglycoside or quinolone) can be stopped after 5-7 days.
- Consider adjunctive inhaled aminoglycoside for patients with inadequate response to systemic therapy.
- Choose carbapenem if ESBL (extended-spectrum beta-lactamase) (+) strain or Acinetobacter species is known or suspected.
- If Legionella pneumophila known or suspected, use a macrolide or quinolone instead of an aminoglycoside.
- DURATION OF THERAPY: Efforts should be made to shorten the duration of therapy to periods as short as 7 days provided that the etiologic pathogen is not *Pseudomonas* and that the patient has a good clinical response with resolution of clinical features of infection.
  - *Pseudomonas* and *Acinetobacter* infections should be treated for longer duration of 14 days.
- PK/PD analysis will be done for the following organisms: SPACE bugs and MRSA. Antibiotic recommendations will be provided by pharmacy based on results.

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**Days 2 and 3: Check cultures and assess clinical response: temperature, WBC, chest X-ray, oxygenation, purulent sputum, hemodynamic changes, and organ function.**

**Clinical Improvement at 48-72 hour**

**NO**
- Cultures -
  - Search for other pathogens, complications, other diagnoses or other sites of infection
- Cultures +
  - Adjust antibiotic therapy, search for other pathogens, complications, other diagnoses, or other sites of infection

**YES**
- Cultures -
  - Consider stopping antibiotics
- Cultures +
  - De-escalate antibiotics, if possible. Treat selected patients for 7-8 days and reassess