ICR-VAP-005

Critical care · pneumonia

Updated 21 Jun 2026

CRITICAL CARE ORDER SET

Ventilator-associated Pneumonia

Empiric ICU management of adult VAP. Treat as higher MDR risk — start broad with MRSA and antipseudomonal cover, layer a newer β-lactam / β-lactamase-inhibitor when resistant gram-negatives are likely, then de-escalate hard at 48–72 hours. Adapt every agent to your antibiogram and renal function.

PATIENT	MRN	WEIGHT (KG)	DATE / TIME
ALLERGIES	**DAY OF VENTILATION**	**ORDERING CLINICIAN**	**ATTENDING**

01 Core diagnostic orders

FIRST Draw cultures **before** antibiotics — but do not delay empiric therapy in septic shock. Antibiotics within 1 hour of recognition.

- [ ] Blood cultures ×2 (different sites) before antibiotics
- [ ] **Endotracheal aspirate** (± BAL / protected specimen brush per unit) for culture & Gram stain
- [ ] MRSA nasal PCR / screen (if available)
- [ ] CBC, CMP (creatinine, LFTs); lactate if sepsis suspected; ABG / VBG as indicated
- [ ] Chest x-ray (or CT chest if needed)

- [ ] Viral respiratory panel (COVID-19, influenza) as indicated

02 MDR risk screen

CHECK AND DOCUMENT

- [ ] IV antibiotics in the last `90 days`
- [ ] Prior MRSA colonization / infection
- [ ] Prior MDR GNR (ESBL, CRE, MDR *Pseudomonas*, *Acinetobacter*)
- [ ] Hospitalization ≥ `5 days` / prolonged ICU stay
- [ ] Structural lung disease (bronchiectasis, CF)
- [ ] Significant immunosuppression

RULE **Any** MDR factor present → treat as high-risk VAP with broad initial coverage (Section 3), then de-escalate.

03 Standard empiric regimen

USE WHEN High suspicion for VAP with **no prior cultures** suggesting highly resistant organisms. Combine one agent from each of the three blocks below.

3.1 · Antipseudomonal β-lactam

CHOOSE ONE

- [ ] Piperacillin–tazobactam `4.5 g IV q6h`
- [ ] Cefepime `2 g IV q8h`
- [ ] Ceftazidime `2 g IV q8h`
- [ ] Meropenem `1 g IV q8h` (if ESBL risk)
- [ ] Imipenem–cilastatin `500 mg IV q6h`
- [ ] Aztreonam `2 g IV q8h` (severe β-lactam allergy)

3.2 · MRSA agent

CHOOSE ONE

- [ ] **Vancomycin** — load `20–25 mg/kg IV` once, then `~15 mg/kg IV q8–12h` (AUC/trough-guided, renally adjusted)

OR

- [ ] **Linezolid** `600 mg IV q12h`

3.3 · Second antipseudomonal

CHOOSE ONE — DIFFERENT CLASS FROM 3.1

- [ ] Levofloxacin `750 mg IV q24h`
- [ ] Ciprofloxacin `400 mg IV q8h`
- [ ] Amikacin `15–20 mg/kg IV q24h` (pharmacy-dosed)
- [ ] Gentamicin / tobramycin `5–7 mg/kg IV q24h`

TYPICAL A common starting pattern is **piperacillin–tazobactam + vancomycin + levofloxacin** (or an aminoglycoside), with rapid de-escalation once cultures return. Reserve polymyxins (colistin / polymyxin B) for culture-proven extreme MDR.

04 Newer agents — where they fit

WHEN Use mainly with prior cultures or high suspicion for ESBL / carbapenemase-producers / MDR *Pseudomonas*, and with ID support. These **replace** the primary β-lactam in 3.1 — not added on top.

4.1 · ESBL / MDR *Pseudomonas* (not carbapenemase)

USE IN PLACE OF STANDARD B-LACTAM

- [ ] **Ceftolozane–tazobactam** (Zerbaxa) `3 g IV q8h` (2 g / 1 g, renally adjusted) — MDR *Pseudomonas*
- [ ] **Ceftazidime–avibactam** (Avycaz) `2.5 g IV q8h` (2 g / 0.5 g, renally adjusted) — ESBL / KPC

4.2 · Carbapenem-resistant organisms (CRE, MDR *Acinetobacter*)

ID-DRIVEN · SUBSTITUTE FOR PRIMARY B-LACTAM

- [ ] **Ceftazidime–avibactam** — KPC-producing CRE
- [ ] **Meropenem–vaborbactam** — KPC CRE (where available)
- [ ] **Imipenem–cilastatin–relebactam** — carbapenem-resistant *Pseudomonas* / Enterobacterales
- [ ] **Cefiderocol** — highly resistant gram-negatives (selected cases)

CONSULT If CRE or a carbapenemase-producer is suspected, **involve ID** and choose per local susceptibilities before committing to a newer agent.

05 Duration & de-escalation

DURATION Planned **7 days** if clinical response is adequate and no complications. Extend only for select pathogens / complications.

REASSESS AT 48–72 HOURS

- [ ] Narrow or stop MRSA coverage if cultures negative **and** MRSA screen negative
- [ ] Narrow to **one** active antipseudomonal agent once susceptibilities are back
- [ ] Stop aminoglycoside / polymyxin as soon as a safer active agent is confirmed
- [ ] Consider procalcitonin trend + clinical improvement to support stopping at 7 days

06 Monitoring & supportive care

MONITORING

- [ ] Daily CBC, BMP (Cr, electrolytes); vital signs, I/O, weight
- [ ] Vancomycin / aminoglycoside — pharmacy-dosed, drug levels per protocol
- [ ] Linezolid — platelet count twice weekly if treatment > 7–10 days or high risk

SUPPORTIVE / ADJUNCTIVE

- [ ] Oxygen to maintain SpO_2 goal (e.g., ≥ **92%**, individualized by ARDS / COPD status)
- [ ] Ventilator management per ARDS / ICU lung-protective protocol
- [ ] Acetaminophen `650–1000 mg PO/NG/IV q6h PRN` (max 3–4 g/day)
- [ ] DVT and stress-ulcer prophylaxis per ICU protocol
- [ ] Elevate head of bed, daily sedation/spontaneous-breathing trials, secretion management (VAP bundle)

Not a substitute for clinical judgement. Verify doses, allergies, renal function, and contraindications. Adapt all agents and thresholds to your institutional protocols, antibiogram, and the individual patient.

Spreading knowledge
Improving outcomes