HAP & VAP

Hospital- & ventilator-associated pneumonia

MANAGE
then narrow

MANAGEMENT PATHWAY

resuscitate → cover → source → review → de-escalate

1. **Resuscitate (sepsis bundle)**
2. **Cultures: resp + blood**
3. **Empiric antibiotics NOW**
4. **Drain empyema / abscess**
5. **Review at 48-72 h**
6. **De-escalate · stop day 7**

DEFINE

HAP pneumonia ≥ 48 h after admission. **VAP** ≥ 48 h after intubation. (HCAP retired.)

Always cover S. aureus + Pseudomonas + other Gram-negatives.

DIAGNOSE

New / progressive infiltrate PLUS ≥ 2 of: fever · leukocytosis / leukopenia · purulent secretions · worsening oxygenation.

Send a LOWER-respiratory culture before antibiotics. Do not rely on CPIS.

EMPIRIC THERAPY

one antipseudomonal β-lactam; add cover only for risk

Component	Agent & dose	When
Antipseudomonal β-lactam	Pip-tazo 4.5 g q6h OR cefepime 2 g q8h OR meropenem 1 g q8h	ALWAYS (single agent if low-risk)
+ MRSA cover	Vancomycin (25-30 mg/kg load → AUC 400-600) OR linezolid 600 mg q12h	Prior IV abx 90 d · MRSA > 20% / unknown · high mortality
+ 2nd antipseudomonal	Aminoglycoside (gentamicin 5-7 mg/kg) OR antipseudomonal FQ	Resistance risk · septic shock · structural lung disease

MONITOR RESPONSE

- Track fever, WCC, oxygenation (P/F), secretion volume
- Follow cultures; de-escalate to the narrowest agent
- Procalcitonin trend can support stopping
- Steady but slow improvement - do NOT reflexively broaden

NOT IMPROVING BY DAY 3?

- **Wrong bug -** resistant / MRSA / Pseudomonas - recheck cultures, broaden
- **Complication -** empyema, abscess, cavitation → CT + drainage
- **Wrong diagnosis -** ARDS, aspiration, PE, oedema, malignancy
- **Undrained source -** empyema or device - control it

DURATION

- **7 days -** for most HAP / VAP incl. Pseudomonas - not 14
- **Longer -** empyema, abscess, extrapulmonary spread
- **De-escalate -** narrow on culture at 48-72 h; treat disease not colonisation

VAP PREVENTION BUNDLE

- Head up 30-45°; subglottic-suction ETT; daily SAT + SBT
- Prefer NIV / HFNO; avoid unnecessary (re)intubation
- Oral care; cuff 20-30 cmH_2O; minimise circuit changes; VTE + PUD prophylaxis

ORGANISM-DIRECTED (once cultures back): MRSA → vancomycin or linezolid · Pseudomonas → antipseudomonal β-lactam (2nd agent only if resistant) · ESBL → meropenem · Acinetobacter → sulbactam ± polymyxin · Stenotrophomonas → co-trimoxazole. Narrow to ONE agent.

PEARLS & PITFALLS

- Send a lower-respiratory culture before antibiotics - it is what lets you de-escalate safely.
- Not improving by day 3? Think resistant bug, empyema / abscess, or the wrong diagnosis.
- 7 days treats most VAP, including Pseudomonas - longer courses breed resistance without benefit.
- Only add MRSA and double-Pseudomonas cover for genuine risk; a positive aspirate alone is colonisation.

References: IDSA/ATS HAP-VAP Guideline 2016 · Surviving Sepsis Campaign 2021 · follow the local antibiogram.

Educational aid; verify doses against local protocol and patient factors.