

Investigation and Management of Ventilator-Associated Pneumonia

Ventilator-associated pneumonia (arising >48h after mechanical ventilation) suspected based on at least 2 of:

- fever ($T \geq 38^\circ\text{C}$) or hypothermia ($T < 36^\circ\text{C}$)
- purulent secretions
- worsening gas exchange
- leukocytosis or leukopenia

1. RT to obtain sputum sample for Microbiology
2. Obtain CXR
3. Calculate CPIS

CPIS ≤ 6

CPIS > 6

Is patient immunocompromised?

No

Yes

Consider:

- empiric antimicrobial therapy as soon as possible*
- bronchoscopy with BAL
- Infectious Diseases consult

1. Obtain quantitative specimen (either bronchoscopy with BAL OR bronchoscopy with PSB OR blind PSB OR mini-BAL)
2. Start empiric antimicrobial therapy as soon as possible*

Tailor antimicrobial therapy based on quantitative culture results

No significant growth

Significant growth

Discontinue antimicrobials

Treat with an effective antimicrobial for **7 days** (except for *S. aureus* with bacteremia, when a minimum of 14 days is recommended)

*Empiric Antimicrobial Therapy

- Empirical antimicrobial therapy should be based on a patient's recent microbiology, in addition to recent antimicrobial therapy and local susceptibility trends. However:
 - For most patients: **piperacillin-tazobactam**
 - For patients with severe penicillin allergy: **meropenem**
 - Add an aminoglycoside (i.e. **gentamicin or tobramycin**) if patient in septic shock
 - Consider adding **TMP-SMX** in TGH ICU for *S. maltophilia*, *E. cloacae* coverage
- If patient has severe sepsis/septic shock, antimicrobials should be given immediately in addition to aggressive fluid resuscitation, etc.
- If patient is known to be colonized with MRSA or MRSA is strongly suspected, then **vancomycin** or **TMP-SMX** should be added pending further microbiology results.
- If patient is known to be colonized with ESBL, then use **meropenem** not piperacillin-tazobactam
- There is no role for empiric coverage of Legionella or other atypical bacteria for VAP