Nosocomial pneumonia (NP) or hospital-acquired pneumonia (HAP) is defined as pneumonia occurring in the oropharynx or upper gastrointestinal tract of the patient.

1. Specific high-risk populations:
   - (i) patients with COPD,
   - (ii) patients with ARDS,
   - (iii) serum albumin level less than 2.2 g/dL,
   - (iv) patients undergoing mechanical ventilation for more than 3 days,
   - (v) those with coma or impaired consciousness,
   - (vi) burns, or trauma,
   - (vii) those with severe underlying medical conditions as evaluated by a high APACHE II or APACHE III score or presence of organ failure.

2. Specific treatment modalities or therapeutic intervention:
   - (i) use of H2 blockers or antacids,
   - (ii) previous antibiotics,
   - (iii) use of drugs that are markers for severe underlying disease such as dopamine, dobutamine, or paralytic agents or continuous sedation.

- Risk factors for infection with Legionella species include diabetes, immunosuppression, high-dose corticosteroid therapy, malignancy, end-stage renal failure, history of smoking, excessive alcohol use or a known local prevalence of hospital-acquired disease.

Treatment algorithm:

1. Mild disease
   - For patients with mild disease, use:
     - amoxycillin+clavulanate 875+125 mg (child: 22.5+3.2 mg/kg up to 875+125 mg) orally, 12-hourly for 7 days.
   - If patient is unable to take oral therapy, use:
     - benzylpenicillin 1.2 g (child: 30 mg/kg up to 1.2 g) IV, 6-hourly PLUS gentamicin 4 to 6 mg/kg (child <10 years: 7.5 mg/kg; >10 years: 6 mg/kg) IV, daily
   - Switch to amoxycillin+clavulanate (as above) when patient is able to tolerate oral therapy.

2. Moderate to severe disease
   - For patients with moderate to severe disease, use:
     - ceftriaxone 1 g (child: 25 mg/kg up to 1 g) IV, 12-hourly OR
     - ceftazidime 1 g (child: 25 mg/kg up to 1 g) IV, 8-hourly OR
     - ticarcillin+clavulanate 3+0.1 g (child: 50+1.7 mg/kg up to 3+0.1 g) IV, 6-hourly OR
     - THE COMBINATION OF benzylpenicillin 1.2 g (child: 30 mg/kg up to 1.2 g) IV, 6-hourly PLUS gentamicin 4 to 6 mg/kg (child <10 years: 7.5 mg/kg; >10 years: 6 mg/kg) IV, daily
   - Switch to oral therapy as for patients with mild disease after there has been significant improvement.
   - In adult patients with immediate penicillin hypersensitivity as a single drug, use:
     - moxifloxafoxin 400 mg orally, daily for 7 days.

- In most patients receiving mechanical ventilation, fever and pulmonary infiltrates are not due to infection and a specific diagnosis should be sought using appropriate diagnostic techniques.
- Quantitative microbiological culture of appropriately obtained lower respiratory tract specimens before commencing therapy, or when antibiotic therapy has remained unchanged for 72 hours, may improve diagnostic accuracy.
- There is little published evidence to guide treatment options.
- The following regimens are likely to be equivalent but site-specific protocols based on local endemic multidrug-resistant (MDR) organisms should be developed.
- In addition, local protocols for de-escalation or cessation of therapy if cultures are negative on day 3 are encouraged.
- There is evidence that the response to appropriate antimicrobial therapy for ventilator-associated pneumonia (VAP) occurs within the first 6 days and that prolonged therapy results in colonisation and reinfection with resistant organisms.
- Treatment for 8 days is recommended except for Pseudomonas aeruginosa, Acinetobacter species or Stenotrophomonas maltophilia when treatment may be needed for up to 15 days.

- In patients hospitalised in high-risk wards (eg ICU, high-dependency units, known specific resistance problem) for 5 days or longer, use:
  - cefepime 2 g (child: 50 mg/kg up to 2 g) IV, 12-hourly OR
  - piperacillin-tazobactam 4+0.5 g (child: 100+12.5 mg/kg up to 4+0.5 g) IV, 8-hourly OR
  - ticarcillin+clavulanate 3+0.1 g (child: 50+1.7 mg/kg up to 3+0.1 g) IV, 6-hourly OR
  - If Gram-negative cocci are seen on Gram stain and/or the hospital has a high prevalence of MRSA, add vancomycin to the above regimen and discontinue if cultures are negative after 48 hours:
    - Vancomycin 25 mg/kg up to 1 g (child: 15 years: 30 mg/kg up to 1 g) IV, 12-hourly (monitor blood levels).

- Combination therapy using an aminoglycoside has shown a strong trend to reduced mortality for HAP due to MDR organisms in critically ill patients. In patients with severe pneumonia, consider adding gentamicin to the above regimen:
  - gentamicin 4 to 6 mg/kg (child <10 years: 7.5 mg/kg; >10 years: 6 mg/kg) IV, daily.

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