Antibiotic choice should be guided by microbiological susceptibility data. However, unlike in the United States and some regions of Europe and South-East Asia, penicillin-resistant strains of Streptococcus pneumoniae (MIC >2 mg/L) are a rare cause of pneumonia in Australia. Furthermore, S. pneumoniae strains that display intermediate-resistance to penicillin (MIC 0.125 to <2 mg/L) respond appropriately to routine doses of penicillin.

For pneumococcal pneumonia due to all strains other than those demonstrated to be penicillin-resistant, use:
- benzylpenicillin 1.2 g (child: 30 mg/kg up to 1.2 g) IV, 6-hourly until significant improvement, then amoxycillin 1 g (child: 25 mg/kg up to 1 g) orally, 8-hourly for a total treatment duration of 7 days.

- For pneumonia due to S. pneumoniae strains that are resistant to penicillin (MIC >2 mg/L), seek advice from an infectious diseases physician or clinical microbiologist.

- In patients hypersensitive to penicillin (excluding immediate hypersensitivity), use:
  - ceftriaxone 1 g (child: 25 mg/kg up to 1 g) IV, daily until significant improvement, then cefuroxime 500 mg (child: 10 mg/kg up to 500 mg) orally, 12-hourly for a total treatment duration of 7 days.
  - OR, cefotaxime 1 g (child: 25 mg/kg up to 1 g) IV, 8-hourly until significant improvement, then cefuroxime 500 mg (child: 10 mg/kg up to 500 mg) orally, 12-hourly for a total treatment duration of 7 days.
  - In adult patients with immediate penicillin hypersensitivity, use:
    - moxifloxacin 400 mg orally or IV, daily for 7 days.
    - Alternatively, consider the use of vancomycin

- Staphylococcal pneumonia may occur as a primary diagnosis, or secondary to right-sided endocarditis, influenza or aspiration.

- It is commonly severe, especially in children, and may be either community- or hospital-acquired.

- An initial sputum Gram stain will usually show predominantly Gram-positive cocci in clusters.

- Recently, there has been an increase in the incidence of severe community-acquired pneumonia caused by community strains of MRSA, especially among some populations (eg inwithervenous drug users, Indigenous and Pacific Island children and adults).

- These strains are genetically different from routine hospital MRSA strains. Sometimes they are clinically more aggressive (related to the presence of virulence factor Panton-Valentine leucocidin [PVL]) and may be susceptible to some routine antibiotics such as clindamycin and trimethoprim sulfamethoxazole.

- Appropriate susceptibility testing of all Staphylococcus aureus aureus isolates is therefore crucial.

- Antibiotic therapy after these new community MRSA strains should be guided by microbiological susceptibility data and specialist advice may be necessary.

- In contrast, in many other clinical settings, the presence of S. aureus or MRSA in sputum culture may simply represent colonisation.

- For non-MRSA staphylococcal pneumonia, use:
  - dicloxacillin 2 g (child: 50 mg/kg up to 2 g) IV, 6-hourly OR
  - flucloxacillin 2 g (child: 50 mg/kg up to 2 g) IV, 6-hourly
  - OR, ceffazolin 2 g (child: 50 mg/kg up to 2 g) IV, 6-hourly

- For patients with immediate penicillin hypersensitivity and severely ill patients with suspected staphylococcal pneumonia, until antibiotic susceptibility data are available, use vancomycin 25 mg/kg up to 1 g (child <12 years: 30 mg/kg up to 1 g) IV, 12-hourly.

- For severely ill patients with suspected MRSA staphylococcal pneumonia, vancomycin should be given together with the beta-lactam regimen above until susceptibility data are known.

- Consultation should be sought on the timing and type of subsequent oral therapy, but generally 7 to 14 days is required for uncomplicated staphylococcal pneumonia.

- Although some recent studies have suggested that linezolid may be more effective than vancomycin in patients with MRSA pneumonia, each of these studies suffers from significant methodological flaws. Thus, vancomycin should remain the treatment of choice, except for pneumonia caused by vancomycin-intermediate strains of S. aureus (VISA or heteroVISA [hVISA]) when linezolid should be used.

- Pneumonia due to Legionella species may present with a variety of nonpulmonary symptoms such as mental confusion, diarrhoea and hyponatraemia, as well as severe respiratory distress.

- Diagnosis can be made by sputum or bronchoalveolar lavage (BAL) culture, serology, urinary antigen detection or polymerase chain reaction (PCR) of respiratory specimens.

- The new Legionella urinary antigen assay has aided early diagnosis in some cases since it can be performed early on routine urine specimens (either before or after commencing antibiotics) and appears to have acceptable sensitivity. However, this assay detects only Legionella pneumophila type 1 (the commonest cause of Legionella pneumonia), not other Legionella species.

- For patients with Legionella pneumonia, use:
  - azithromycin 500 mg IV or orally, daily OR
  - doxycycline 100 mg IV or orally, 12-hourly OR
  - or erythromycin 500 mg to 1 g IV (preferably through a central line), 6-hourly or erythromycin 500 mg orally, 6-hourly OR
  - or erythromycin (ethyl succinate formulation) 800 mg orally, 6-hourly

  - PLUS for very severe cases requiring ICU care, consider adding:
    - ciprofloxacin 400 mg IV, 12-hourly OR
    - or ofloxacin 750 mg orally, 12-hourly OR
    - rifampicin 600 mg IV or orally, daily

- Total IV therapy treatment duration for Legionella pneumonia is 7 to 14 days for immunocompetent patients, but 14 to 21 days for the immunocompromised.