

Pneumonia in the Adult

Nurses have an important role in the management of the patient being treated for pneumonia in both the inpatient and outpatient settings. This guide provides basic information on the different classifications of pneumonia in adults.

DEFINITIONS	
Pneumonia	An acute infection of the lower respiratory tract due to microorganism invasion of the pulmonary parenchyma.
Community-acquired pneumonia (CAP)	<p>An acute infection of the pulmonary parenchyma in a patient who has acquired the infection in the community, outside of a hospital or healthcare facility.</p> <p><i>[Note: Healthcare-associated pneumonia (HCAP) refers to pneumonia acquired in healthcare facilities such as nursing homes, hemodialysis centers and outpatient clinics or during hospitalization during the past three months. These patients were thought to be at increased risk of multidrug-resistant (MDR) pathogens. Patients previously designated as HCAP will be included in the next update of the CAP guidelines, and should be treated in a similar fashion as those with CAP.]</i></p>
Hospital-acquired pneumonia (HAP)	<ul style="list-style-type: none"> • Pneumonia that occurs 48 hours or more after hospital admission. • May be caused by healthcare devices or environment. • Can be transmitted between staff and patients.
Ventilator-associated pneumonia (VAP)	<ul style="list-style-type: none"> • Pneumonia that develops 48 to 72 hours after endotracheal intubation. • May be caused by aspiration of oropharyngeal pathogens or leakage

	of bacteria around cuff of endotracheal tube.
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ASSESSMENT AND DIAGNOSIS	
Clinical features	<p><i>General</i></p> <ul style="list-style-type: none"> • Cough, fever, pleuritic chest pain, dyspnea, tachypnea, hypoxia, sputum production, leukocytosis/leukopenia; rarely: hemoptysis. • Crackles, rhonchi, tubular breath sounds, diminished breath sounds or dullness to percussion. <p><i>CAP</i></p> <ul style="list-style-type: none"> • Typical: Sudden-onset fever, productive cough, shortness of breath, signs of pulmonary consolidation (dullness, increased fremitus, bronchial breath sounds, crackles), and occasionally, pleuritic chest pain. • Atypical: Gradual onset, dry cough, shortness of breath, crackles, general myalgias, fatigue. <p><i>HAP</i></p> <ul style="list-style-type: none"> • New or progressive pulmonary infiltrate on chest imaging and two of the three following clinical features: fever greater than 38°C, leukocytosis or leukopenia, or purulent secretions. <p><i>VAP</i></p> <ul style="list-style-type: none"> • New or progressive pulmonary infiltrate on chest imaging and one or more of the following findings: fever, purulent tracheobronchial secretions, leukocytosis, tachypnea, decreased tidal volume, increased minute ventilation, and decreased oxygenation. Signs and symptoms may develop gradually or suddenly.
Radiographic features	Infiltrate on x-ray or CT scan of the chest/thorax may include lobar consolidation, interstitial infiltrates, and/or cavitation (Bartlett, 2017).

Diagnostic criteria	<ul style="list-style-type: none"> • Clinical symptoms plus radiological evidence of infiltrate on chest imaging. • Pathogen identification by microbiologic evaluation of lower respiratory secretions supports diagnosis.
Microbiologic evaluation	<ul style="list-style-type: none"> • Sample sources: expectorated sputum, induced sputum, tracheal secretions, alveolar lavage, or pleural fluid. • Collection: Obtain specimen prior to antibiotic initiation, rinse mouth prior to expectoration, ensure no food intake one to two hours prior to expectoration, and transport specimen promptly to lab.

Care Essentials for Patients with Pneumonia

- Perform a detailed history to identify patients at risk for multi-drug resistant (MDR) pathogens. Risk factors for MDR include (Kalil et al., 2016):
 - Prior intravenous antibiotic use within 90 days.
 - Five or more days of hospitalization prior to the occurrence of diagnosis.
 - Septic shock at time of diagnosis.
 - Acute renal replacement therapy prior to VAP onset.
- If patient is admitted to the hospital, first dose of antibiotic should be administered in emergency department.
- In hospitalized patient:
 - Closely monitor vital signs.
 - Observe for progression of symptoms, such as hypoxemia, tachypnea, tachycardia, and fever.

- Use general infection control strategies, including strict handwashing and use of alcohol-based hand sanitizers.
- Follow policies to reduce or alter antibiotic prescribing practices.
- If the patient is intubated, use ventilator bundle strategies to prevent VAP:
 - Elevate the head of bed 30 to 45 degrees per policy, unless contraindicated.
 - Perform oral hygiene with 2% oral chlorhexidine solution.
 - Assess daily for weaning readiness and extubation.
 - Use sedation reduction strategies, as ordered.
 - Maintain cuff pressures of 20 to 25 mmHG.
 - Ensure aspiration precautions; enteral feedings preferred over parenteral.
 - Administer stress bleeding and deep vein thrombosis prophylaxis, as ordered.
- Administer antibiotics and supplemental oxygen, as prescribed.
 - For patients with HAP or VAP, a 7-day course of antibiotics is recommended; this antibiotic therapy should be de-escalated (narrow the antibiotic regimen and change from combination therapy to monotherapy).
 - For patients with CAP, treat for a minimum of five days; however longer treatment may be necessary.
 - Before stopping therapy, the patient should be afebrile for 48 to 72 hours, breathing without supplemental oxygen (unless required for preexisting disease), and have no more than one clinical instability factor (defined as HR > 100 beats/min, RR > 24 breaths/min, and SBP ≤ 90 mmHg).
 - Procalcitonin, along with clinical criteria, may be used to guide discontinuation of antibiotic therapy; procalcitonin levels have been shown to correlate with bacterial infection.
- Monitor for drug reactions.
- Perform respiratory/pulmonary hygiene.
- Observe isolation precautions, as indicated.
- Assist with early mobility.
- Encourage smoking cessation or refer, when applicable.
- Provide nutritional support.
- Immunize prior to discharge from hospital and educate patient on immunization recommendations, including annual influenza vaccine and pneumococcal vaccine according to age and previous immunization status.

References:

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