

DIANE'S NGN NCLEX 2026 • VISUAL STUDY LIBRARY

Pneumonia

Acute infection of the lung parenchyma producing alveolar consolidation, impaired gas exchange, and — in the older adult — confusion that is often the *only* presenting clue.

SYSTEM • RESPIRATORY

CLUSTER • INFECTIOUS DISEASE

PRIORITY • AIRWAY / GAS EXCHANGE

NGN 2026 • CLINICAL JUDGMENT

SOURCE DISCLOSURE

This topic is not present in Diane's uploaded reference notes. Content compiled from external NCLEX-aligned references: Saunders Comprehensive Review for the NCLEX-RN 2026, ATI RN Adult Medical-Surgical Nursing,

Lippincott Illustrated Reviews: Pharmacology, CDC pneumococcal & influenza vaccine guidance (2025–2026), and IDSA/ATS Community-Acquired Pneumonia clinical guidelines.

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DEFINITION • OVERVIEW

What Pneumonia Is & Why It Matters

- ▶ **Inflammation & infection of lung parenchyma** (alveoli, alveolar ducts, bronchioles) caused by bacteria, viruses, fungi, or aspirated material.
- ▶ **Alveoli fill with exudate** (pus, fluid, cellular debris) → consolidation → **V/Q mismatch** → hypoxemia.
- ▶ **Leading infectious cause of death** in the U.S.; highest mortality in adults ≥65, immunocompromised, and clients with chronic lung disease.

CLASSIFICATIONS YOU MUST DISTINGUISH

CAP Community-acquired — onset outside or within 48 h of admission.

HAP Hospital-acquired — onset ≥48 h after admission; higher resistance risk.

VAP Ventilator-associated — onset ≥48 h after intubation.

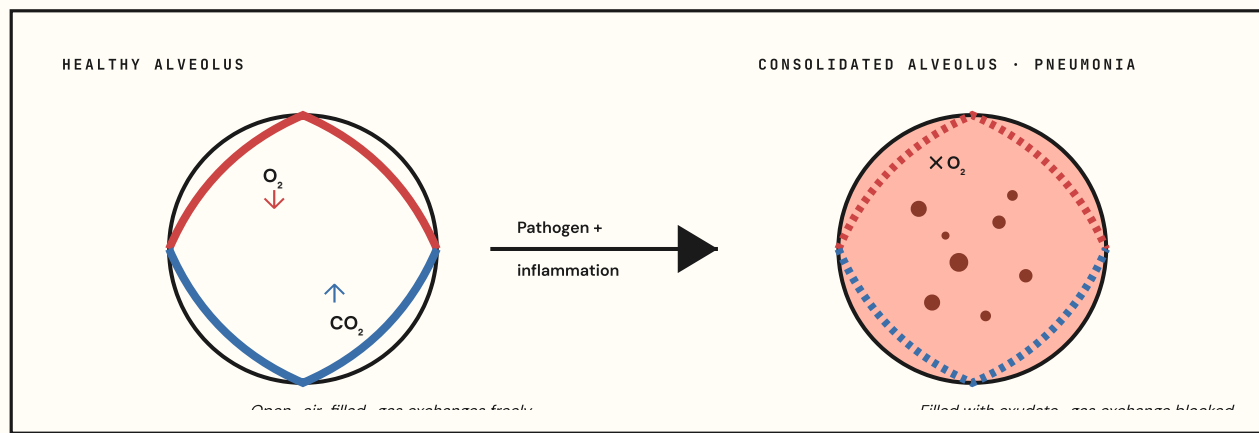
HCAP Healthcare-associated — dialysis, LTC, recent hospitalization.

Aspirational Stomach/oropharyngeal contents → right lower lobe most common.

Atypical Mycoplasma, Legionella, Chlamydophila — "walking pneumonia."

PATHOPHYSIOLOGY

2 How a Healthy Alveolus Becomes a Consolidated One



STEP 1 Pathogen enters lower airway (inhalation, aspiration, hematogenous)

STEP 2 Host defenses overwhelmed → inflammatory cascade

STEP 3 Capillary leak → exudate (WBCs, fibrin, fluid) floods alveoli

STEP 4 Consolidation → V/Q mismatch → shunt → hypoxemia

STEP 5 ↑ Work of breathing, sepsis risk, possible ARDS

WHY ELDERLY CLIENTS CONFUSE SO QUICKLY

Hypoxemia + dehydration + inflammatory mediators cross a less-resilient brain — **new-onset confusion may be the only sign of pneumonia in adults ≥65**. Fever and cough are frequently *absent*.

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SIGNS & SYMPTOMS

Early Findings vs. Late / Red-Flag Findings

Early • Typical

- Fever, chills, diaphoresis
- Productive cough (sputum color varies — see below)
- Pleuritic chest pain (sharp, worse with inspiration)
- Tachypnea (RR > 20), tachycardia
- Crackles / rales over affected lobe
- Bronchial breath sounds over consolidation
- Dullness on percussion
- ↑ Tactile fremitus, egophony ("E → A")
- Fatigue, myalgia, headache
- ↑ WBC with left shift; ↑ procalcitonin

Late • Severe • Red Flags 🚨

- SpO₂ < 90% on room air; cyanosis (lips, nail beds)
- RR > 30 / use of accessory muscles / nasal flaring
- New-onset **confusion or lethargy** (esp. ≥65 y/o)
- Hypotension (SBP < 90) — septic shock
- Hemoptysis
- Inability to speak full sentences
- Respiratory failure → impending intubation
- Decreased urine output (< 30 mL/hr)
- Worsening ABG: ↓ PaO₂, ↑ PaCO₂, respiratory acidosis
- Pleural effusion / empyema on imaging

SPUTUM COLOR → LIKELY PATHOGEN CLUE



Rust-colored
Strep. pneumoniae



Green / foul
Pseudomonas, anaerobes



Yellow-tan
S. aureus, H. influenzae



Pink, frothy
Suspect pulmonary edema — not pneumonia

🚨 CALL THE PROVIDER IMMEDIATELY FOR

RR > 30 · SpO₂ < 90% despite O₂ · new confusion · SBP < 90 · hemoptysis · accessory-muscle use that wasn't there an hour ago. These are **NGN "recognize cues / take action"** prompts.

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PRIORITY NURSING INTERVENTIONS

ABCs + Safety + Sepsis-Aware Care

A

Airway

- Position **High-Fowler's** (or semi-Fowler's if hypotensive)
- Suction PRN — do not over-suction
- If unilateral pneumonia: **"good lung down"** for perfusion
- Encourage cough & deep breathing q1-2h
- Maintain humidified airway

B

Breathing / Gas Exchange

- O₂ titrate to **SpO₂ ≥ 92%** (≥ 88-92% if COPD — risk of CO₂ retention)
- Incentive spirometer q1-2h while awake
- Monitor ABG, capnography, work of breathing
- Chest physiotherapy / postural drainage as ordered
- Bronchodilators & mucolytics on schedule

C

Circulation / Sepsis

- Vitals q2-4h; trend toward sepsis (HR ↑, BP ↓, RR ↑, temp)
- Blood cultures × 2 + sputum culture **BEFORE first antibiotic**
- Antibiotics within **4 hours** of admission (within 1 h if sepsis)
- Strict I&O; IV fluids unless contraindicated (HF)
- Lactate; monitor for septic shock

SAFETY & COMFORT BUNDLE

- ▶ Cluster care to allow rest periods — exertion ↑ O₂ demand
- ▶ Small, frequent, high-calorie / high-protein meals
- ▶ Hydration 2-3 L/day (unless HF/renal) — thins secretions
- ▶ DVT prophylaxis: SCDs ± LMWH (immobile + inflammation)
- ▶ Oral care q4h — reduces VAP / HAP risk
- ▶ Fall precautions if confused or hypoxic

NGN PRIORITIZATION PEARLS

- ▶ **First action** for SpO₂ 86% → reposition + apply O₂ *before* calling provider.
- ▶ **Sputum/blood cultures BEFORE antibiotics** — once dosed, results are unreliable.
- ▶ If client also has COPD, do **NOT** flood with high-flow O₂ — start low, titrate up.
- ▶ Aspiration pneumonia → keep **NPO until swallow eval**; HOB ≥ 30° always.

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PHARMACOLOGY

Drugs You'll See on the Exam

DRUG / CLASS	MECHANISM	KEY SIDE EFFECTS	NURSING CONSIDERATIONS
Azithromycin <i>Macrolide</i>	Inhibits bacterial protein synthesis (50S ribosome). First-line for CAP outpatient.	QT prolongation, GI upset, hepatotoxicity, ototoxicity (high dose).	Baseline ECG if cardiac history. Avoid with other QT-prolonging drugs. Take with food if GI upset.
Levofloxacin <i>Fluoroquinolone</i>	Inhibits DNA gyrase & topoisomerase IV. Used when atypical coverage needed.	Tendon rupture (Achilles) , photosensitivity, QT prolongation, C. difficile, ↓ glucose in diabetics.	Avoid in < 18 y/o & pregnancy. Separate from antacids/dairy by 2 h. Stop & report tendon pain.
Ceftriaxone <i>3rd-gen Cephalosporin</i>	Disrupts cell-wall synthesis. Inpatient CAP combined with macrolide.	Diarrhea, rash, C. difficile, cross-sensitivity in PCN-allergic clients.	Ask about PCN allergy. Monitor for superinfection. IV: dilute properly; not with calcium in neonates.
Piperacillin-tazobactam <i>Extended PCN</i>	Broad-spectrum; covers Pseudomonas (HAP/VAP).	Diarrhea, rash, ↓ K ⁺ , nephrotoxicity (esp. with vancomycin).	Monitor renal function, K ⁺ . Slow IV infusion. Watch for allergic reaction.
Vancomycin <i>Glycopeptide</i>	Inhibits cell-wall synthesis; covers MRSA in HAP/VAP.	Red man syndrome (rapid infusion), nephro/ototoxicity.	Infuse over ≥ 60 min. Trough levels 15–20 mcg/mL. Monitor BUN/Cr & hearing.
Oseltamivir <i>Antiviral</i>	Neuraminidase inhibitor — used for influenza pneumonia within 48 h of onset.	N/V, headache, neuropsych changes (esp. adolescents).	Start within 48 h of symptoms. Take with food. Not a substitute for vaccination.
Albuterol <i>Short-acting β₂ agonist</i>	Bronchodilation — relieves wheezing/bronchospasm.	Tachycardia, tremor, nervousness, ↓ K ⁺ .	Give before chest physiotherapy. Hold & reassess if HR > 20 above baseline.
Guaifenesin / Acetylcysteine <i>Mucolytic / Expectorant</i>	Thins & loosens secretions.	N/V, bronchospasm (acetylcysteine — rotten-egg odor).	Encourage fluids 2–3 L/day. Have suction ready with acetylcysteine.
Acetaminophen <i>Antipyretic / Analgesic</i>	Reduces fever & pleuritic pain.	Hepatotoxicity if > 4 g/day (3 g if liver disease/ETOH).	Check all combo meds for hidden APAP. Monitor LFTs.

DRUG / CLASS	MECHANISM	KEY SIDE EFFECTS	NURSING CONSIDERATIONS
PCV20 / PPSV23 <i>Pneumococcal vaccines</i>	Active immunization against <i>S. pneumoniae</i> .	Local soreness, low-grade fever.	Recommend ≥ 65 y/o & high-risk adults; can be given with annual flu vaccine in opposite arm.

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NCLEX TEST TRAPS

What Students Miss • Wrong vs. Right

✗ TRAP ANSWER Give the first antibiotic, then send the sputum culture once the lab opens.

✓ CORRECT ACTION Obtain sputum & blood cultures **BEFORE** the first antibiotic dose — antibiotics destroy the diagnostic yield.

✗ TRAP ANSWER Apply 6 L/min O₂ via nasal cannula to a COPD client with pneumonia and SpO₂ 88%.

✓ CORRECT ACTION Start low (1–2 L/min) and **titrate to SpO₂ 88–92%** — high-flow O₂ can suppress the hypoxic drive and cause CO₂ retention.

✗ TRAP ANSWER An 82-year-old has new confusion but no fever or cough — probably dementia progression, recheck in the morning.

✓ CORRECT ACTION Treat new-onset confusion in the older adult as **pneumonia (or sepsis) until proven otherwise** — fever and cough are often absent.

✗ TRAP ANSWER Position the client with right-lower-lobe pneumonia with the right side down — gravity helps drain it.

✓ CORRECT ACTION Position with the **good (left) lung DOWN**. The dependent lung gets best perfusion; you want perfusion at the alveoli that can actually exchange gas.

✗ TRAP ANSWER The client feels better on day 4 of a 7-day antibiotic course — okay to stop early to avoid resistance.

✓ CORRECT ACTION **Complete the full prescribed course**. Stopping early breeds resistance and causes relapse.

✗ TRAP ANSWER Premedicate the dyspneic, anxious pneumonia client with a generous dose of opioid sedative for comfort.

✓ CORRECT ACTION Use sedatives **cautiously** — they suppress respiratory drive and cough. Treat hypoxia first; anxiety often resolves with O₂.

✗ TRAP ANSWER For aspiration pneumonia, resume PO diet on the day after admission to keep up nutrition.

✓ CORRECT ACTION Keep **NPO until a swallow evaluation** clears the client. HOB ≥ 30° at all times — including during tube feeds.

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PATIENT & FAMILY EDUCATION

What They Take Home Matters Most

Medication & Recovery

- ✓ Finish **every dose** of the antibiotic, even if you feel well
- ✓ Take antibiotics at evenly spaced intervals
- ✓ Report rash, severe diarrhea, tendon pain, jaundice
- ✓ Fatigue may last 4–6 weeks — pace yourself
- ✓ Return to the clinic for follow-up chest X-ray in 6–8 weeks
- ✓ Seek care for fever > 101°F, worsening cough, or new SOB

Prevention

- ✓ Annual **influenza vaccine** (every fall)
- ✓ **Pneumococcal vaccine** (PCV20 once, or PCV15 + PPSV23) at ≥65 y/o or earlier with chronic conditions
- ✓ COVID-19 vaccination per current CDC schedule
- ✓ Hand hygiene; avoid close contact during outbreaks
- ✓ **Smoking cessation** — single biggest preventable risk
- ✓ Manage chronic conditions (diabetes, HF, COPD)

Daily Lung Habits

- ✓ Use incentive spirometer 10 breaths q1–2h while awake
- ✓ Cough & deep-breathe; reposition q2h
- ✓ Drink 2–3 L water/day unless restricted
- ✓ Eat small, frequent, protein-rich meals
- ✓ Rest between activities; gradually rebuild stamina
- ✓ Avoid crowds & sick contacts during recovery

When to Call 911

- ✓ Severe shortness of breath at rest
- ✓ Blue lips or fingertips
- ✓ Chest pain that doesn't ease with rest
- ✓ Confusion, drowsiness, won't wake up
- ✓ Coughing up blood
- ✓ Fever > 102°F that won't come down

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MEMORY BOOSTERS

Mnemonics & Pattern Recognition

"PNEUMONIA" — symptom recognition

P

Productive cough — sputum may be rust, green, yellow

N

Neuro changes — confusion (esp. older adult — often the only sign)

E

Elevated temp, HR, RR, WBC

U

Unilateral crackles & bronchial breath sounds on auscultation

M

Malaise, myalgia, headache

O

O₂ sat low, dyspnea, pleuritic pain

N

Nutrition & fluids — small frequent meals, 2–3 L/day

I

Incentive spirometer + cough/deep-breathe

A

Antibiotics within 4 h — cultures **FIRST**

"GOOD LUNG DOWN"

For **unilateral** pneumonia, position with the **healthy lung dependent**. Gravity perfuses the dependent lung — putting the working alveoli where the blood goes maximizes V/Q match.

"CURB-65" SEVERITY SCORE

Confusion · **Urea** > 19 · **RR** ≥ 30 · **BP** < 90/60 · **age** ≥ 65. Each = 1 point. Score ≥ 2 → consider admission; ≥ 3 → ICU evaluation. NGN loves this for prioritization items.

"CULTURES, THEN CEFTING"

Mantra to remember: **cultures BEFORE cephalosporins** (or any antibiotic). If you give the antibiotic first, the culture won't grow the bug.

SPUTUM COLOR → BUG

Rust = Strep pRneumoniae · **Green** / foul = Pseudomonas / anaerobes · **Yellow** = Staph / Haemophilus · **Pink frothy** ≠ pneumonia — that's pulmonary edema.

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NGN • NCJMM CLINICAL JUDGMENT

Six-Step Walk-Through

SCENARIO

An 82-year-old female arrives at the ED from a long-term care facility. Per staff, she has been "more confused" for 2 days and "won't eat." Vitals: T 100.4°F (38.0°C), HR 112, RR 28, BP 98/58, SpO₂ 89% on room air. She is oriented to person only. Lung auscultation reveals coarse crackles in the right lower lobe and dullness to percussion on the right. Cough is non-productive. Skin is warm and dry. PMH: HTN, mild dementia, COPD (on home O₂ 2 L/min).

STEP 1

Recognize Cues

Relevant: new confusion, RR 28, SpO₂ 89%, HR 112, T 100.4°F, BP 98/58, RLL crackles + dullness, age 82, COPD on home O₂.

Irrelevant: baseline mild dementia, dry skin, dietary preferences.

STEP 2

Analyze Cues

Cluster matches **pneumonia + possible sepsis**: respiratory (RR, SpO₂, focal crackles, dullness) + systemic (fever, tachycardia, hypotension) + neuro (confusion — likely *only* presenting sign in elderly).

STEP 3

Prioritize Hypotheses

- #1 Pneumonia + early sepsis** (most urgent).
- #2 COPD exacerbation.
- #3 UTI-driven delirium.
- #4 Dehydration alone.

Pneumonia/sepsis tops the list — highest mortality, time-sensitive.

STEP 4

Generate Solutions

HOB up · titrate O₂ to SpO₂ 88–92% (COPD) · IV access × 2 · **cultures (blood × 2 + sputum)** **BEFORE** antibiotics · broad-spectrum antibiotic within 1 h · lactate, CBC, BMP, CXR, ABG · cautious IV fluids · fall & aspiration precautions · monitor MAP.

STEP 5

Take Action

1. Reposition + apply O₂ (titrate cautiously — COPD).
2. Place client on continuous SpO₂/cardiac monitor.
3. Establish 2 IVs.
4. Draw cultures & labs.
5. Hang first antibiotic.
6. Begin 30 mL/kg fluid bolus per sepsis protocol if MAP < 65 — assess crackles before & during.
7. Reassess q15 min.

STEP 6

Evaluate Outcomes

Improving: SpO₂ ≥ 92%, RR < 24, HR < 100, MAP ≥ 65, mental status returning to baseline, lactate trending down.

Worsening / escalate: SpO₂ < 88% on O₂, RR > 30, MAP < 65 after fluids, lactate ↑, ↓ LOC → call rapid response, prepare for possible intubation/ICU.