

RESPIRATORY ▶ CHRONIC DISEASE CLUSTER ▶ NGN NCLEX 2026

Chronic Obstructive *Pulmonary* Disease

Progressive, irreversible airflow limitation from emphysema, chronic bronchitis, or both. The #1 NCLEX trap: hypoxic drive. Master oxygen titration, bronchodilator-before-steroid sequencing, and pursed-lip breathing — they hit on every exam.

● HIGH YIELD

12 SECTIONS

PHARM HEAVY

PRIORITY SETTING

NCJMM CASE INCLUDED

△ SOURCE TRANSPARENCY

This topic is *not* contained in Diane's uploaded reference notes. Content compiled from: SAUNDERS COMPREHENSIVE REVIEW FOR THE NCLEX-RN 2026, ATI RN PHARMACOLOGY MADE EASY 4.0, LIPPINCOTT ILLUSTRATED REVIEWS: PHARMACOLOGY, and GOLD 2025 GLOBAL STRATEGY FOR COPD.



SECTION ONE

Definition & Overview

COPD is a **preventable, treatable, but irreversible** respiratory disease characterized by persistent airflow limitation that worsens over time. It is an umbrella term for two coexisting processes:

Emphysema — "Pink Puffer"

ALVEOLAR DESTRUCTION

- Loss of **elastic recoil** in alveoli
- Alveolar walls destroyed → giant air sacs (bullae)
- **Air trapping** on expiration
- Thin, cachectic body habitus
- Barrel chest (↑ A-P diameter)
- Pursed-lip breathing, tripod position
- Pink skin (compensates O₂ via hyperventilation)

Chronic Bronchitis — "Blue Bloater"

AIRWAY INFLAMMATION

- Productive cough **≥3 months/year × 2 years**
- Excess mucus production, ciliary dysfunction
- Cyanotic, edematous appearance
- **Right-sided HF** (cor pulmonale) common
- Chronic hypoxemia → polycythemia
- Recurrent respiratory infections
- Productive sputum

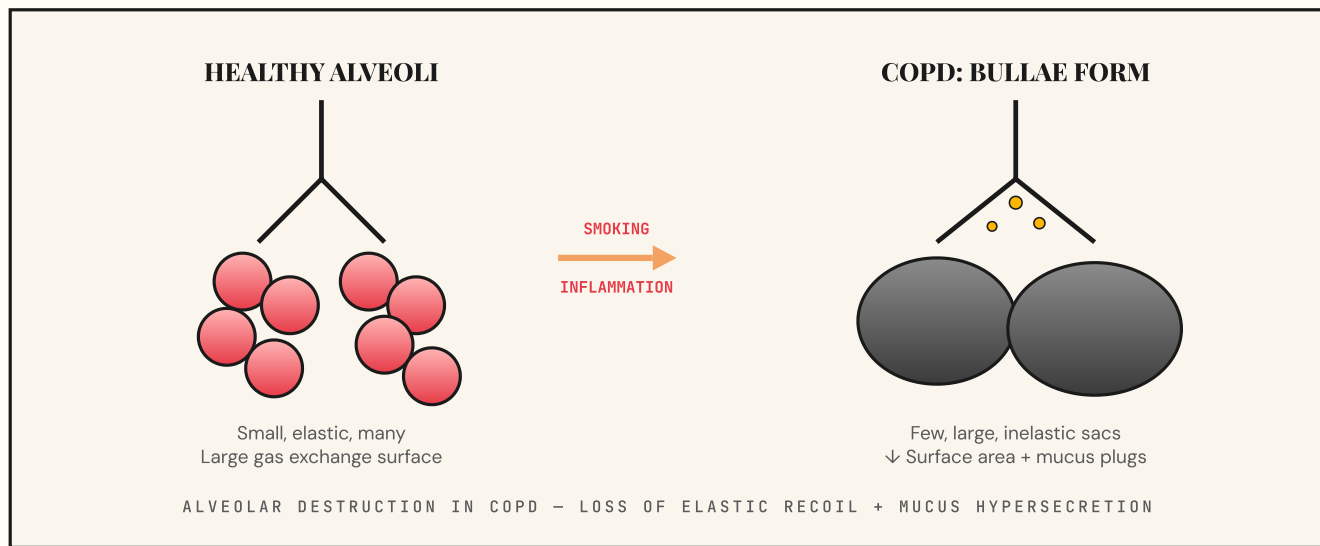
📌 WHY IT MATTERS ON NCLEX

COPD is the **3rd leading cause of death in the U.S.** Smoking accounts for ≈85% of cases. Patients live in *compensated respiratory acidosis* at baseline — this means "normal" ABGs for COPD look abnormal for everyone else. Recognizing this prevents catastrophic over-oxygenation.

SECTION TWO

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Pathophysiology Simplified



1

Trigger: Cigarette smoke / pollutants → chronic inflammation of airways

2

Airway changes: Goblet cell hyperplasia → mucus hypersecretion + ciliary paralysis → mucus plugging

3

Alveolar destruction: Protease/antiprotease imbalance destroys elastin → permanent enlargement of distal airspaces (emphysema)

4

Air trapping: Loss of recoil → alveoli collapse on exhalation → air trapped → ↑ residual volume → hyperinflation (barrel chest)

5

Gas exchange fails: ↓ surface area + V/Q mismatch → **chronic hypoxemia + hypercapnia** (CO₂ retention)

6

Compensation shift: Body resets primary breathing stimulus from CO₂ → **LOW O₂ becomes the drive to breathe (hypoxic drive)**

7

Late complications: Pulmonary HTN → right ventricular hypertrophy → **cor pulmonale** → JVD, peripheral edema, hepatomegaly

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SECTION THREE

Signs & Symptoms

Early Findings

- ▶ Chronic productive cough (worst on waking)
- ▶ Dyspnea on exertion (DOE)
- ▶ Recurrent chest infections
- ▶ Wheezing, prolonged expiration
- ▶ Mild ↓ exercise tolerance
- ▶ Sputum: clear → white in stable disease

Late / Advanced Findings 🚩

- ▶ **Dyspnea at rest**
- ▶ **Barrel chest** (↑ A-P diameter)
- ▶ Tripod positioning, accessory muscle use
- ▶ Pursed-lip breathing
- ▶ **Digital clubbing** (chronic hypoxia)
- ▶ Cyanosis (lips, nail beds)
- ▶ Weight loss / muscle wasting
- ▶ JVD, dependent edema (cor pulmonale)
- ▶ ↓ breath sounds, hyperresonance on percussion

🚩 RED-FLAG FINDINGS — ACUTE EXACERBATION

Change in sputum (yellow/green/↑ volume) • **↑ dyspnea** from baseline • **↑ cough** • Fever, chills • Confusion or somnolence (CO₂ narcosis) • **SpO₂ < 88%** from baseline • Use of accessory muscles at rest • Inability to speak in full sentences

Diagnostic Hallmarks

- ▶ **Spirometry (gold standard):** FEV₁/FVC ratio < 70% post-bronchodilator
- ▶ **ABG (baseline):** ↓ PaO₂, ↑ PaCO₂, ↑ HCO₃⁻ (compensated respiratory acidosis), pH 7.35–7.45
- ▶ **CXR:** Hyperinflation, flattened diaphragm, ↑ A-P diameter
- ▶ **CBC:** Polycythemia (Hgb > 18) from chronic hypoxia
- ▶ **Alpha-1 antitrypsin level** in early-onset/non-smoker COPD

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SECTION FOUR

Priority Nursing Interventions (ABCs)

Apply **ABC framework**: Airway first, then Breathing, then Circulation. Never sedate a COPD patient with dyspnea — the priority is supporting ventilation, not blunting it.

A — Airway

- ▶ Suction PRN for thick secretions
- ▶ Encourage cough & deep breathing q1–2h
- ▶ Chest physiotherapy / postural drainage
- ▶ Maintain hydration **2–3 L/day** (thins mucus) — unless cardiac/renal contraindication

B — Breathing

- ▶ **High Fowler's or tripod** position
- ▶ **Low-flow O₂: 1–3 L/min via NC** only
- ▶ **Target SpO₂ 88–92%** (NOT 95–100%)
- ▶ Teach **pursed-lip breathing** & diaphragmatic breathing
- ▶ Incentive spirometer q1h while awake
- ▶ Humidified oxygen

C — Circulation

- ▶ Monitor for cor pulmonale: JVD, edema, weight gain
- ▶ Daily weights (early HF detection)
- ▶ Strict I&O
- ▶ Monitor for dysrhythmias from hypoxia
- ▶ Assess perfusion: cap refill, color, peripheral pulses

Nutrition Support

- ▶ **Small, frequent, high-calorie, high-protein meals**
- ▶ Soft foods (less chewing → less fatigue)
- ▶ **Limit gas-forming foods** (broccoli, cabbage, beans) — distention worsens dyspnea
- ▶ Rest **30 minutes before meals**
- ▶ Eat largest meal when energy peaks (often breakfast)
- ▶ Monitor for weight loss → poor prognosis

Energy Conservation

- ▶ Cluster nursing care
- ▶ Schedule rest periods between activities
- ▶ Sit when possible (shower chair, kitchen stool)
- ▶ Exhale during the hard part of activity
- ▶ Avoid temperature extremes & pollutants
- ▶ Pulmonary rehabilitation referral

ACUTE EXACERBATION PROTOCOL

1. Elevate HOB / position upright • 2. Apply O₂ to maintain SpO₂ 88–92% • 3. Nebulized bronchodilator (albuterol ± ipratropium) • 4. IV/PO corticosteroids • 5. Antibiotics if bacterial infection suspected • 6. ABG & CXR • 7. Prepare for **NIPPV (BiPAP)** if respiratory failure imminent

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SECTION FIVE

Pharmacology

Golden rule: When giving inhalers together, **bronchodilator FIRST**, wait **5 minutes**, then steroid. The bronchodilator opens airways so the steroid can reach deeper tissue.

CLASS / DRUG	MECHANISM	KEY ADVERSE EFFECTS	NURSING CONSIDERATIONS
SABA — Rescue Albuterol (Proventil, Ventolin) Levalbuterol	β_2 agonist → bronchodilation in 5–15 min	Tachycardia, tremor, palpitations, hypokalemia, nervousness	Rescue inhaler — always carry. Use first when combining inhalers. Check HR. Overuse = ↓ asthma control.
LABA — Maintenance Salmeterol (Serevent) Formoterol	Long-acting β_2 agonist; 12-hour bronchodilation	Same as SABA + risk of severe bronchospasm if used alone in asthma	NOT a rescue drug. Maintenance only — q12h dosing. Never give for acute attack.
Anticholinergic Ipratropium (Atrovent) — short Tiotropium (Spiriva) — long	Blocks acetylcholine → bronchodilation + dries secretions	Dry mouth, urinary retention, constipation, blurred vision	Spiriva = once daily. Caution in BPH & glaucoma. Rinse mouth after use. Peanut allergy? Some forms contain soya lecithin — check.
Inhaled Corticosteroid (ICS) Fluticasone (Flovent) Budesonide (Pulmicort)	↓ airway inflammation	Oral thrush (candidiasis), hoarseness, ↑ infection risk	Rinse mouth + spit after each use. Use spacer. NOT for acute attacks. Daily, scheduled.
Combo Inhalers Advair (fluticasone+salmeterol) Symbicort (budesonide+formoterol)	LABA + ICS in one device	Combined effects of both classes	Maintenance — q12h. Rinse mouth after.
Methylxanthine Theophylline	Bronchodilator + mild anti- inflammatory	Narrow therapeutic window: 10–20 mcg/mL Toxicity > 20: N/V, tachycardia, tremors, seizures, dysrhythmias	Monitor levels q6–12 mo. Avoid caffeine. Smoking ↑ clearance (lower dose if patient quits). Many drug interactions.
Systemic Corticosteroid Prednisone (PO) Methylprednisolone (IV)	↓ inflammation in exacerbation	Hyperglycemia, immunosuppression, osteoporosis, mood changes, ↑ infection, weight gain	Short course (5–14 days) for exacerbation. Taper gradually. Take with food. Monitor BG.
Mucolytic Acetylcysteine (Mucomyst) Guaifenesin	Thins/loosens secretions	Bronchospasm, rotten-egg smell (acetylcysteine)	Pre-medicate with bronchodilator. Encourage fluids 2–3 L/day.

CLASS / DRUG	MECHANISM	KEY ADVERSE EFFECTS	NURSING CONSIDERATIONS
PDE-4 Inhibitor Roflumilast (Daliresp)	↓ inflammation in severe COPD with chronic bronchitis	Weight loss, mood changes/suicidal ideation, diarrhea, nausea	Not for acute symptoms. Monitor mental health & weight.
Antibiotics (during exacerbation) Azithromycin, doxycycline, augmentin	Treats bacterial infection triggering exacerbation	GI upset, C. diff risk, QT prolongation (azithro)	Complete full course. Watch for change in sputum color.

Inhaler Technique Quick-Check

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- ▶ **MDI:** Shake → exhale fully → seal lips → press & inhale slowly (3–5 sec) → hold breath 10 sec
 - ▶ **Spacer:** Always recommend — ↑ delivery, ↓ thrush
 - ▶ **DPI (dry powder):** Do NOT shake. Inhale *fast and deep*. Keep dry.
 - ▶ **Sequence:** Bronchodilator → wait 5 min → corticosteroid → rinse mouth

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SECTION SIX

NCLEX Test Traps !

x COMMON WRONG CHOICE

Apply **O₂ at 6 L/min via nasal cannula** to a COPD patient who is hypoxic.



✓ CORRECT ACTION

Start **1–3 L/min NC**, titrate to SpO₂ **88–92%**. High-flow O₂ can **abolish the hypoxic drive** → respiratory arrest.

x WRONG

Target SpO₂ of **95–100%** in a COPD patient.



✓ RIGHT

Target SpO₂ **88–92%** in chronic COPD. Anything higher risks CO₂ retention.

x WRONG

Use **salmeterol (Serevent)** for an acute asthma attack or COPD exacerbation.



✓ RIGHT

Salmeterol is a **LABA — maintenance only**. Use **albuterol (SABA)** for rescue.

x WRONG

Give the **fluticasone before albuterol** when both are due.



✓ RIGHT

Bronchodilator FIRST (albuterol), wait **5 minutes**, then steroid (fluticasone). Then rinse mouth.

x WRONG

Place the dyspneic COPD patient in **supine** position with sedation for comfort.



✓ RIGHT

High Fowler's or tripod; avoid sedatives — they suppress respiratory drive in an already-compensating patient.

x WRONG

Interpret an ABG of pH 7.36 / PaCO₂ 55 / HCO₃ 30 in COPD as "**acute respiratory failure**".



✓ RIGHT

This is **baseline compensated respiratory acidosis** — normal for chronic COPD. Compare to *their* baseline, not textbook normals.

x WRONG

Teach the patient to **breathe in through pursed lips**.



✓ RIGHT

Pursed-lip breathing = **inhale through the NOSE, exhale through PURSED LIPS** — prolongs expiration, prevents alveolar collapse.

x WRONG

Restrict fluids in a COPD patient to prevent edema.



✓ RIGHT

Encourage 2–3 L/day (unless cardiac/renal contraindication) — thins mucus, eases expectoration.

SECTION SEVEN

7

Patient & Family Education

1

Smoking Cessation

The **single most important intervention**. Slows disease progression more than any medication. Offer NRT, varenicline, counseling. Avoid secondhand smoke.

2

Vaccinations

Annual influenza vaccine • **Pneumococcal** (PCV13 + PPSV23) • **COVID-19** per CDC • **RSV** if ≥ 60 yo • **Tdap**. Prevent exacerbation triggers.

3

Pursed-Lip Breathing

Inhale through nose for 2 counts → **exhale** through pursed lips (like blowing out a candle) for 4 counts. Use during activity & dyspnea.

4

Diaphragmatic Breathing

Hand on belly — feel it rise on inhale, fall on exhale. Trains diaphragm; reduces accessory muscle dependence.

5

Inhaler Technique

Shake (MDI only). Exhale fully. Seal lips. Slow inhale. Hold breath 10 sec. **Bronchodilator first** → wait **5 min** → **steroid** → **rinse mouth**.

6

Recognize Exacerbation

Call provider for: **change in sputum color/volume**, **↑ dyspnea**, **fever**, **confusion**, **↓ activity tolerance**. Have action plan written down.

7

Energy Conservation

Sit while showering, dressing, cooking. Use long-handled tools. **Exhale during exertion** (lifting, pushing). Rest 30 min before meals.

8

Nutrition

Small, frequent, **high-cal/high-protein** meals. **Avoid gas-forming foods** (broccoli, beans, cabbage). Stay hydrated. Weight loss = poor prognosis — report.

9

Avoid Irritants

Smoke, fumes, aerosols, strong perfumes, cold air, pollen. Use a scarf over mouth/nose in cold weather. Air purifier indoors.

10

Home Oxygen Safety

NO SMOKING, **no open flames**, **no petroleum products** (Vaseline) near O₂. Post "Oxygen in Use" sign. Keep tank upright, secure. Check tubing for kinks.

11

Pulmonary Rehab

Structured exercise + education program. Proven to ↑ exercise capacity, ↓ dyspnea, ↓ hospitalizations. Refer all stable COPD patients.

12

Mental Health

Depression & anxiety are common with COPD. Screen routinely. Anxiety worsens dyspnea — teach pursed-lip breathing as anxiety tool too.

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SECTION EIGHT

Memory Boosters & Mnemonics

"BLUE BLOATER vs PINK PUFFER"

Quick differential — chronic bronchitis is the **cyanotic, edematous** one (right HF + fluid). Emphysema is the **thin, pink** one fighting to push air out.

"BREATHE" — COPD Care Bundle

Bronchodilators (SABA first)

Rest between activities

Educate on pursed-lip breathing

Avoid irritants & smoking

Tripod position for dyspnea

High-cal, high-protein nutrition

Evacuate secretions (suction, CPT, fluids)

"SOAP" — Order of Inhalers

Shake the MDI (if MDI)

Open airways first — bronchodilator

After 5 min — give corticosteroid

Protect mouth — rinse & spit

"COPD" — The Disease Itself

Chronic cough

Obststructed airflow

Pulmonary mucus & bullae

Dyspnea & barrel chest

🎯 Key Numbers to Memorize

- ▶ **2–3 L/min** = max O₂ flow for COPD
- ▶ **88–92%** = target SpO₂ for COPD
- ▶ **5 minutes** = wait between bronchodilator & steroid
- ▶ **10–20 mcg/mL** = theophylline therapeutic range
- ▶ **70%** = FEV₁/FVC cutoff for diagnosis
- ▶ **2–3 L/day** = fluid intake for mucus thinning
- ▶ **30 min** = rest before meals

🔗 Pattern Recognition

- ▶ **Barrel chest + tripod + pursed lips** = emphysema
- ▶ **Productive cough + cyanosis + edema** = chronic bronchitis + cor pulmonale
- ▶ **Change in sputum color** = infection / exacerbation
- ▶ **Drowsy + ↑ CO₂** = CO₂ narcosis → check O₂ flow rate!
- ▶ **Clubbing** = chronic hypoxia (years)

▶ **≥3 months × 2 years** = chronic bronchitis definition

▶ **JVD + edema in COPD** = cor pulmonale



SECTION NINE

NCJMM Clinical Judgment Scenario

Patient Scenario

Mr. R is a **68-year-old male** with a 45-pack-year smoking history, admitted from clinic for ↑ dyspnea. VS: T 100.4°F, HR 112, RR 28, BP 148/86, **SpO₂ 85% on RA**. He is leaning forward, using accessory muscles, productive cough with **thick yellow sputum**. ABG: pH 7.30, PaCO₂ 62, PaO₂ 56, HCO₃ 30. Lungs: wheezes & coarse crackles bilaterally. The previous nurse applied O₂ at 6 L/min NC 30 min ago. Mr. R now appears drowsy and confused.

STEP 1 — RECOGNIZE CUES

What relevant data is present?

Subjective: ↑ dyspnea, productive cough.

Objective: Drowsy & confused (NEW), SpO₂ was 85% → now on 6 L/min, RR 28, accessory muscle use, tripod, fever, thick yellow sputum, wheezes/crackles, ABG shows acute-on-chronic respiratory acidosis (pH 7.30, ↑↑ PaCO₂, ↓ PaO₂), 45-pack-year smoker.

Critical cue: O₂ was set at **6 L/min — too high for COPD** — and the patient is now somnolent: **CO₂ narcosis** is developing.

STEP 2 — ANALYZE CUES

What is the likely cause?

Mr. R is in **acute COPD exacerbation** (yellow sputum + fever + ↑ dyspnea = bacterial trigger) **complicated by iatrogenic CO₂ narcosis**. High-flow O₂ abolished his hypoxic drive → CO₂ retention → drowsiness/confusion. ABG confirms acute respiratory acidosis on top of chronic compensation.

STEP 3 — PRIORITIZE HYPOTHESES

What's the urgent priority?

#1 Priority: Impending respiratory failure from CO₂ narcosis — airway/breathing threat. **#2:** Acute infection driving exacerbation. **#3:** Hypoxemia (PaO₂ 56). Address the iatrogenic O₂ overdose *without* stripping all oxygen — titrate carefully.

STEP 4 — GENERATE SOLUTIONS

What actions are indicated?

- **Titrate O₂ DOWN to 2 L/min NC** — target SpO₂ 88–92%, do NOT remove entirely
- Position high Fowler's or tripod-supported
- Stimulate & reorient — assess LOC continuously
- Notify provider immediately
- Anticipate orders: nebulized albuterol + ipratropium, IV methylprednisolone, antibiotic, repeat ABG, sputum culture
- Prepare for **BiPAP** if no improvement
- Continuous SpO₂ & cardiac monitoring

STEP 5 – TAKE ACTION

Implement priority interventions

Reduce O₂ to 2 L/min, maintain SpO₂ 88–92%. Position upright. Call rapid response/provider. Administer nebulized bronchodilators per order. Reassess LOC, RR, SpO₂ q5 min initially. Have BiPAP & intubation supplies readily available.

STEP 6 – EVALUATE OUTCOMES

Did the interventions work?

Expected positive outcomes: LOC improving (alert, oriented), RR 16–22, SpO₂ 88–92% on 2 L NC, ABG pH normalizing toward 7.35–7.45, PaCO₂ trending toward baseline, clearer breath sounds, sputum easier to expectorate, fever resolving with antibiotic.

Escalation needed if: LOC worsens, SpO₂ remains < 88% on titrated O₂, pH < 7.25, hemodynamic instability — proceed to BiPAP/intubation.

Diane's NGN NCLEX 2026 Visual Study Library

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