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Abnormal *Breath* Sounds

Adventitious lung sounds — what they sound like, what they mean, what to do. A complete reference for auscultation findings every nurse must recognize, prioritize, and act on under the NGN clinical judgment model.

SYSTEM • RESPIRATORY

PRIORITY • ABC • AIRWAY

NGN • RECOGNIZE CUES

SOURCE TRANSPARENCY

This topic is not present in Diane's uploaded reference notes. Content compiled from external evidence-based sources: Saunders Comprehensive Review for the NCLEX-RN Examination (2026), ATI RN Adult Medical-Surgical Nursing, Lippincott Manual of Nursing Practice, Bates' Guide to Physical Examination, American Thoracic Society auscultation guidelines, and Hinkle & Cheever Brunner & Suddarth's Textbook of Medical-Surgical Nursing.



FOUNDATIONS

Definition & Why It Matters

Adventitious (abnormal) breath sounds are added noises layered on top of normal breathing — produced when air moves through narrowed, fluid-filled, collapsed, or inflamed airways.

- ▶ **Normal breath sounds** include vesicular (soft, low-pitched, over peripheral lung), bronchovesicular (medium pitch, near main bronchi), and bronchial/tracheal (loud, high-pitched, over trachea).
- ▶ **Adventitious sounds** are superimposed on these — they tell the nurse *something is wrong* with the airway, the alveoli, the pleura, or air movement itself.
- ▶ **Why it matters:** auscultation is a non-invasive cue source that drives ABC priority decisions. A new wheeze, a sudden absence of sounds, or stridor can mean the difference between watching and rescuing.

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PATHOPHYSIOLOGY

How Abnormal Sounds Are Produced

Each adventitious sound has a distinct mechanism — recognizing the *why* behind the sound makes it impossible to confuse them on the exam.

→ MECHANISM A

Fluid in alveoli/small airways pops open with inspiration → **CRACKLES**

→ MECHANISM B

Narrowed bronchi force air through tight passages → **WHEEZES**

→ MECHANISM C

Thick secretions rattle in large airways → **RHONCHI**

→ MECHANISM D

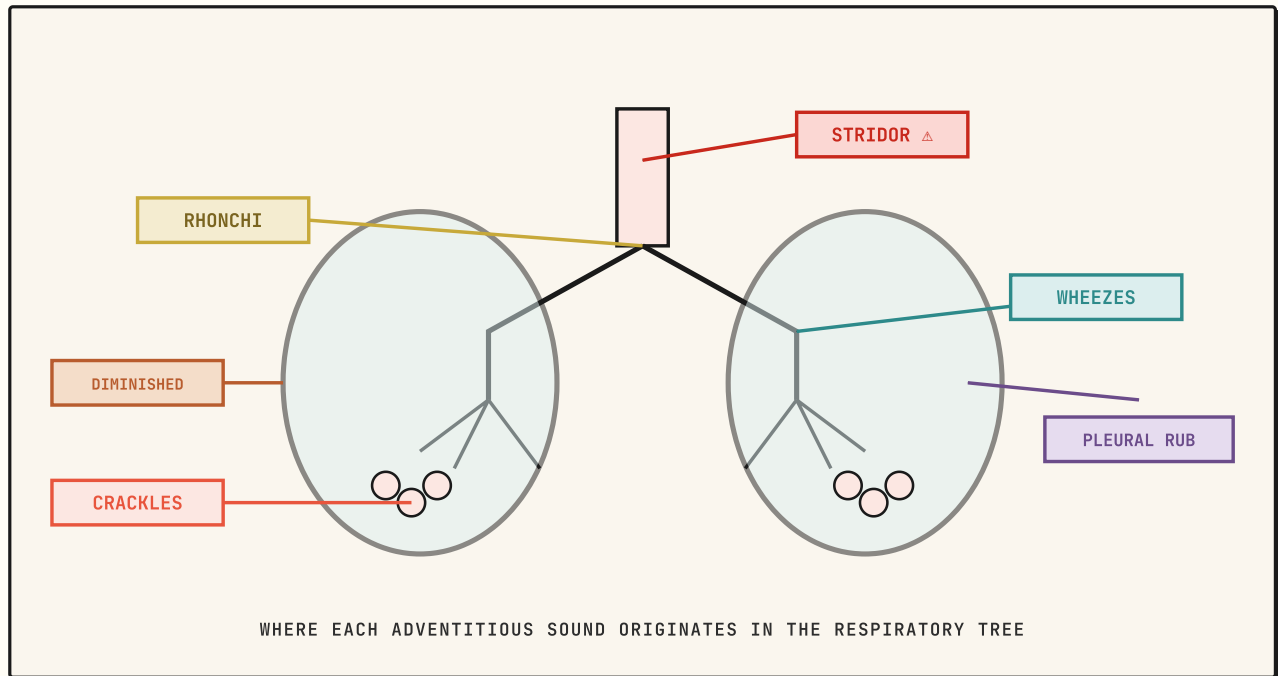
Upper airway obstruction forces air past a narrowed glottis/trachea → **STRIDOR**

→ MECHANISM E

Inflamed pleural surfaces rub together with each breath → **PLEURAL RUB**

→ MECHANISM F

No air movement (collapse, effusion, pneumothorax) → **DIMINISHED / ABSENT**



03

MASTER REFERENCE

The Seven Abnormal Breath Sounds

Each card below covers description, where heard, when in the breath cycle, conditions that cause it, complications to watch for, and priority nursing interventions.

Crackles (*formerly "rales"*)

INSPIRATION (mainly)

FINE = high pitch • COARSE = low pitch

Bases & peripheral lung

WHAT IT SOUNDS LIKE

Fine crackles: brief, high-pitched popping like rubbing hair between your fingers near your ear, or Velcro pulling apart, or cellophane crinkling. Heard at end-inspiration.

Coarse crackles: louder, lower-pitched, bubbling/gurgling sounds heard in both inspiration and early expiration.

MECHANISM

Fluid, mucus, or pus in the alveoli and small airways. Collapsed alveoli snap open with inspiration → that pop is the crackle.

INDICATIONS / CONDITIONS

- Pulmonary edema / CHF (classic bilateral bases)
- Pneumonia
- Atelectasis (may clear with cough/deep breath)
- Pulmonary fibrosis (dry "Velcro" crackles)
- ARDS, bronchiectasis

POTENTIAL COMPLICATIONS

- Worsening hypoxemia, respiratory failure
- Flash pulmonary edema (rising up the lung fields)
- Sepsis (if pneumonia source)
- Cardiogenic shock (if CHF cause)

PRIORITY NURSING INTERVENTIONS

- **Position:** High Fowler's (decreases venous return, eases work of breathing)
- **Oxygen:** Apply as ordered; titrate to SpO₂ goal (typically ≥ 92%, ≥ 88% in COPD)
- **Assess:** Lung sounds, SpO₂, respiratory rate/effort, JVD, peripheral edema, daily weights
- **Anticipate:** Diuretics (furosemide) for CHF; antibiotics for pneumonia; morphine for severe edema
- **Cough & deep breathe:** Incentive spirometer for atelectasis-related crackles that clear with effort

Wheezes

EXPIRATION (mainly)

HIGH-pitched musical

Diffuse or localized

WHAT IT SOUNDS LIKE

High-pitched, musical whistling. May be heard without a stethoscope in severe cases. Usually loudest on expiration but can be biphasic in severe obstruction.

Localized wheeze = think foreign body or tumor.

Diffuse wheeze = think asthma or COPD.

MECHANISM

Air forced through narrowed lower airways — bronchoconstriction, mucosal edema, or thick mucus plugs.

INDICATIONS / CONDITIONS

- Asthma (classic — expiratory wheeze)
- COPD / chronic bronchitis
- Anaphylaxis
- Bronchiolitis (peds, RSV)
- Heart failure ("cardiac asthma")
- Foreign body aspiration

POTENTIAL COMPLICATIONS

- Status asthmaticus → respiratory failure
- 🚑 **Silent chest:** a wheezing patient who suddenly stops wheezing is NOT improving — airflow has dropped below the level needed to make sound. Imminent respiratory arrest.
- Anaphylactic shock

PRIORITY NURSING INTERVENTIONS

- **Position:** Upright, leaning forward (tripod position helps)
- **Oxygen:** Apply, monitor SpO₂; humidified if possible
- **Bronchodilators:** Short-acting beta₂ agonist (albuterol) is first-line; nebulizer or MDI
- **Anticipate:** Ipratropium add-on, IV/PO corticosteroids, magnesium sulfate IV for status asthmaticus, epinephrine IM for anaphylaxis
- **Reassess:** Lung sounds, RR, SpO₂, peak flow before AND after treatment
- 🚑 **Sudden absence of wheezing** in a wheezing patient = call rapid response / prepare for intubation

Rhonchi *(also called "sonorous wheezes")*

EXPIRATION

LOW-pitched snoring

Large/central airways

WHAT IT SOUNDS LIKE

Low-pitched, coarse, snoring, gurgling, or rattling. Heard over the large airways. **Often clears or changes with a productive cough** — that's a key distinguishing feature.

MECHANISM

Thick secretions (mucus, pus) moving in the larger airways during expiration. Air bubbles past the secretions, creating the rattle.

INDICATIONS / CONDITIONS

- Chronic bronchitis / COPD
- Pneumonia (especially bacterial)
- Cystic fibrosis
- Bronchiectasis
- Post-op patients with retained secretions

POTENTIAL COMPLICATIONS

- Mucus plugging → atelectasis
- Secondary pneumonia
- Hypoxemia from V/Q mismatch
- Airway obstruction (especially in weak cough)

PRIORITY NURSING INTERVENTIONS

- **Encourage cough:** Have patient cough and re-auscultate — rhonchi often clear
- **Hydration:** Adequate PO/IV fluids thin secretions
- **Position:** Upright; chest physiotherapy / postural drainage as indicated
- **Suction:** Oral or tracheal suction if patient cannot clear independently
- **Anticipate:** Mucolytics (acetylcysteine), bronchodilators, antibiotics if infectious
- **Incentive spirometer:** 10 breaths/hour while awake (post-op)

Stridor

 EMERGENCY

INSPIRATION (loud!)

HIGH-pitched crowing

Upper airway / trachea

WHAT IT SOUNDS LIKE

Loud, high-pitched, harsh crowing/whistling heard **WITHOUT a stethoscope**, primarily on inspiration. Distinct from a wheeze — louder, harsher, and from the upper airway, not the lungs.

MECHANISM

Partial obstruction of the upper airway (larynx, trachea, or above) forcing air past a narrowed opening — like a whistle.

INDICATIONS / CONDITIONS

- Croup (laryngotracheobronchitis — peds)
- Epiglottitis (peds — drooling, tripod, "thumb sign")
- Foreign body aspiration
- Anaphylaxis with laryngeal edema
- Post-extubation airway edema
- Tracheal tumor, vocal cord dysfunction

POTENTIAL COMPLICATIONS

- **Complete airway obstruction**
- Respiratory arrest within minutes
- Cardiac arrest secondary to hypoxia
- Anoxic brain injury

PRIORITY NURSING INTERVENTIONS — IMMEDIATE ACTION

- **DO NOT** attempt to examine the throat of a child with suspected epiglottitis (can trigger complete obstruction)
- **Position:** Allow position of comfort; child upright in caregiver's lap; do NOT force supine
- **Call rapid response / pediatric airway team / anesthesia** immediately
- **Oxygen:** Blow-by oxygen if mask not tolerated; humidified
- **Anticipate:** Nebulized racemic epinephrine, IV/IM corticosteroids (dexamethasone), IM epinephrine for anaphylaxis, emergent intubation or surgical airway
- **Keep intubation/cricothyrotomy supplies at bedside**
- **NPO** in case of surgical airway need

 **STRIDOR IS A TRUE AIRWAY EMERGENCY.** Recognize it, escalate it, do not delay. The "A" in ABCs is on the line.

Pleural Friction Rub

BOTH inspiration & expiration

LOW-pitched grating

Lower lateral chest

WHAT IT SOUNDS LIKE

Low-pitched, grating, creaking, or scratching — like leather rubbing on leather or two pieces of sandpaper. Heard close to the chest wall. **Does NOT clear with cough** (key differentiator from rhonchi). **Disappears when patient holds breath** (key differentiator from a pericardial rub).

MECHANISM

Inflamed visceral and parietal pleural surfaces lose their normal lubrication and rub against each other with each breath.

INDICATIONS / CONDITIONS

- Pleurisy / pleuritis
- Pneumonia with pleural involvement
- Pulmonary embolism (with pleuritic chest pain)
- Pleural effusion (early, before fluid separates the layers)
- TB, lung cancer, post-thoracotomy

POTENTIAL COMPLICATIONS

- Severe pleuritic chest pain → splinting, hypoventilation
- Atelectasis from shallow breathing
- Progression to pleural effusion or empyema
- Missed PE diagnosis

PRIORITY NURSING INTERVENTIONS

- **Pain management:** Analgesics (NSAIDs, opioids) — uncontrolled pain causes shallow breathing
- **Splinting:** Teach to splint with a pillow during cough/deep breathing
- **Position:** Lying on affected side may reduce pain (limits movement of that pleura)
- **Assess:** Pain location/quality, breathing pattern, SpO₂, signs of PE (sudden dyspnea, tachycardia, hemoptysis)
- **Treat the cause:** Antibiotics, anticoagulation for PE, thoracentesis for effusion

Diminished / Absent Breath Sounds

REDUCED or no airflow heard

Localized OR global

WHAT IT SOUNDS LIKE

Faint, distant, or completely absent breath sounds in a region. Compare side-to-side — asymmetry is a major cue. Hyperresonance on percussion + absent sounds = think pneumothorax. Dullness + absent sounds = think effusion or consolidation.

MECHANISM

Air is not moving through that lung region. Cause is either obstruction, collapse, fluid/air displacement, or splinting.

INDICATIONS / CONDITIONS

- **Pneumothorax** (sudden, unilateral absence + hyperresonance + tracheal deviation if tension)
- Pleural effusion (unilateral, with dullness)
- Atelectasis (post-op, mucus plug)
- Hyperinflated lungs in advanced COPD/emphysema (globally diminished)
- Severe obesity, shallow breathing
- Endotracheal tube migrated into right mainstem (absent on left)

POTENTIAL COMPLICATIONS

- 🚑 **Tension pneumothorax** → hemodynamic collapse, cardiac arrest
- Hypoxemia, respiratory failure
- Mediastinal shift
- Untreated effusion → empyema

PRIORITY NURSING INTERVENTIONS

- **Assess immediately:** Symmetry of chest rise, tracheal position, percussion, SpO₂, BP, HR
- **If sudden unilateral absence + dyspnea + hypotension:** Suspect tension pneumothorax → call rapid response, prepare for needle decompression and chest tube
- **Verify ETT placement** if patient is intubated and sounds absent on one side (typically left) — tube may need to be retracted
- **Oxygen:** Apply, high-flow if needed
- **Anticipate:** Chest tube insertion, thoracentesis, bronchoscopy
- **Encourage deep breathing & incentive spirometer** for atelectasis-related diminished sounds

Bronchial Sounds Over Peripheral Lung

Loud, high-pitched, harsh

Where vesicular SHOULD be

WHAT IT SOUNDS LIKE

Loud, high-pitched, hollow sounds with a longer expiratory phase, heard over peripheral lung fields where soft vesicular sounds should be. Often accompanied by **egophony** ("E" sounds like "A"), **bronchophony**, and **whispered pectoriloquy**.

MECHANISM

Consolidated lung tissue (fluid- or pus-filled alveoli) transmits sound from large airways more efficiently than normal aerated lung, so bronchial sounds become audible peripherally.

INDICATIONS / CONDITIONS

- Lobar pneumonia (classic finding)
- Lung mass / tumor
- Atelectasis with surrounding consolidation
- Pulmonary infarction

POTENTIAL COMPLICATIONS

- Sepsis from underlying pneumonia
- Respiratory failure
- Parapneumonic effusion / empyema
- Delayed cancer diagnosis

PRIORITY NURSING INTERVENTIONS

- **Assess:** Full vitals + SpO₂; mental status; sputum color/quality
- **Anticipate:** Chest X-ray, blood cultures BEFORE antibiotics, sputum cultures, ABG
- **Antibiotic timing:** Goal is within 1 hour for sepsis bundle (pneumonia-related sepsis)
- **Oxygen, hydration, deep breathing, antipyretics** as needed
- **Position:** Upright; affected lung up if unilateral (for V/Q optimization)

04

RECOGNIZE CUES

Signs & Symptoms • Early vs. Late

Adventitious sounds rarely appear in isolation. Pair them with the patient's overall respiratory picture to recognize how compensated vs. decompensated they are.

● Early / Compensated

- ▶ New onset adventitious sounds (any type)
- ▶ Restlessness, mild anxiety
- ▶ Tachycardia (early hypoxia)
- ▶ Tachypnea (RR 22–28)
- ▶ Mild use of accessory muscles
- ▶ SpO₂ borderline (90–94%)
- ▶ Skin still pink/warm
- ▶ Mild dyspnea on exertion

● Late / Decompensated • 🚨

- ▶ Sudden absence of previous wheezing ("silent chest")
- ▶ Stridor (any) — emergency
- ▶ Cyanosis (lips, fingers, central)
- ▶ Confusion, lethargy, decreased LOC
- ▶ Bradypnea, bradycardia (pre-arrest)
- ▶ Tripod position, severe retractions
- ▶ Nasal flaring, grunting (peds)
- ▶ SpO₂ < 88% despite oxygen
- ▶ Unable to speak in full sentences
- ▶ Paradoxical chest movement

05

TAKE ACTION

Priority Nursing Interventions · ABC Framework

When you hear an abnormal breath sound, the first question is always: *is the airway open, is breathing effective, is circulation maintained?*

A Airway

- Stridor → airway emergency, do NOT examine throat in suspected epiglottitis
- Position upright / position of comfort
- Suction if secretions are obstructing
- Prepare for intubation/cricothyrotomy if obstruction is severe
- Verify ETT placement if absent sounds on one side

B Breathing

- Apply oxygen (titrate to $\text{SpO}_2 \geq 92\%$, $\geq 88\%$ if COPD)
- Bronchodilators for wheezing
- Cough & deep breathing / incentive spirometer for rhonchi/atelectasis
- Auscultate before AND after every intervention
- Monitor RR, depth, work of breathing, accessory muscle use

C Circulation

- HR, BP, capillary refill, JVD assessment
- Continuous SpO_2 + cardiac monitoring
- IV access (large bore if unstable)
- Anticipate fluids for sepsis OR diuretics for pulmonary edema — opposite responses, get the right one

S Safety & Escalation

- Call rapid response / RRT for stridor, silent chest, tension pneumothorax
- Stay with the deteriorating patient
- Document objective findings, time, response to interventions
- Notify provider with SBAR communication
- Anticipate ABG, CXR, labs

06

PHARMACOLOGY

Medications by Breath Sound

Drug selection follows the mechanism of the abnormal sound. Match the airway problem to the right pharmacologic class.

CLASS & EXAMPLE	MECHANISM (SIMPLE)	USED FOR (SOUND)	KEY SIDE EFFECTS	NURSING CONSIDERATIONS
Short-Acting β_2 Agonist albuterol, levalbuterol	Relaxes bronchial smooth muscle → bronchodilation	Wheezes (asthma, COPD, bronchospasm)	Tachycardia, tremor, nervousness, hypokalemia	Rescue inhaler first. Auscultate before/after. Assess HR before dosing.
Anticholinergic ipratropium, tiotropium	Blocks parasympathetic bronchoconstriction	Wheezes in COPD (first-line), adjunct in asthma	Dry mouth, urinary retention, blurred vision	Caution in glaucoma, BPH. Rinse mouth after MDI.
Corticosteroids (Inhaled & Systemic) fluticasone, budesonide, methylprednisolone, dexamethasone	Reduce airway inflammation & edema	Wheezes (asthma maintenance, COPD exacerbation), stridor (laryngeal edema)	Oral candidiasis (inhaled), hyperglycemia, immunosuppression, osteoporosis (systemic)	Rinse mouth after inhaled steroid. Monitor blood glucose. Taper systemic doses.
Racemic Epinephrine (nebulized) racemic epi neb	Vasoconstricts upper airway mucosa → reduces edema	Stridor (croup, post-extubation edema)	Tachycardia, hypertension, tremor, "rebound" stridor 2–4 h post-dose	Observe for at least 2–4 hours after dose for rebound. Monitor HR/BP.
IM Epinephrine EpiPen 0.3 mg adult / 0.15 mg peds	α & β agonist → vasoconstriction + bronchodilation + ↑ HR	Anaphylaxis with stridor or wheezing	Tachycardia, HTN, anxiety, tremor	Give IM into anterolateral thigh — FIRST-LINE for anaphylaxis. Repeat q5–15 min if needed.
Loop Diuretics furosemide	Removes excess fluid via the kidney	Crackles from CHF / pulmonary edema	Hypokalemia, hyponatremia, dehydration, ototoxicity (rapid IV)	Monitor K ⁺ , daily weights, I&O, BP. Push IV slowly. Daily weight is best volume status indicator.
Morphine (low-dose IV) morphine sulfate	Venodilation → ↓ preload; reduces anxiety; reduces work of breathing	Severe crackles from acute pulmonary edema	Respiratory depression, hypotension, sedation	Monitor RR closely. Naloxone available. Not used in COPD-related dyspnea.
Antibiotics ceftriaxone, azithromycin,	Bacterial eradication	Crackles, rhonchi, bronchial sounds from pneumonia	Allergic reactions, GI upset, C. difficile, QT	Cultures BEFORE first dose. First dose within 1 h for sepsis.

CLASS & EXAMPLE	MECHANISM (SIMPLE)	USED FOR (SOUND)	KEY SIDE EFFECTS	NURSING CONSIDERATIONS
Levofloxacin (CAP); piperacillin-tazobactam (HAP)			prolongation (FQ/macrolide)	Re-auscultate to track resolution.
Mucolytics acetylcysteine, hypertonic saline neb	Thin thick secretions	Rhonchi from retained secretions, CF, bronchiectasis	Bronchospasm (acetylcysteine has rotten-egg smell), nausea	Pretreat with bronchodilator if bronchospasm history. Encourage productive cough after.
Magnesium Sulfate IV MgSO ₄	Smooth muscle relaxant — bronchodilator backup	Severe wheezing / status asthmaticus unresponsive to first-line	Hypotension, flushing, hyporeflexia (toxicity)	Monitor BP, DTRs, RR. Calcium gluconate is the antidote.

07

AVOID MISTAKES

NCLEX Test Traps • Wrong vs. Right

TRAP 01 • THE "SILENT CHEST" MISREAD

Scenario: A patient with severe asthma was wheezing loudly an hour ago. Now the lungs are quiet.

x WRONG

The patient is improving — wheezing has resolved. Document and continue current treatment.



✓ RIGHT

This is impending respiratory arrest. Airflow is below the level needed to produce sound. Call rapid response, prepare for intubation.

TRAP 02 • CRACKLES THAT DON'T CLEAR VS. CRACKLES THAT DO

Scenario: Post-op patient has bibasilar crackles.

x WRONG

Call provider for furosemide order — patient has pulmonary edema.



✓ RIGHT

First ask patient to cough and deep breathe, then re-auscultate. Post-op crackles often = atelectasis and clear with effort. Furosemide is wrong if cause is atelectasis, not fluid overload.

TRAP 03 • STRIDOR IN A CHILD — DO NOT EXAMINE THE THROAT

Scenario: Child with high fever, drooling, tripod position, and inspiratory stridor.

x WRONG

Use a tongue depressor to inspect the throat for redness and assess the airway.



✓ RIGHT

Suspected epiglottitis. Do NOT examine the throat — can trigger complete obstruction. Keep child calm, upright, with caregiver. Notify provider, prepare for OR intubation.

TRAP 04 • RHONCHI VS. PLEURAL RUB

Scenario: Patient has low-pitched, coarse sounds on auscultation.

x WRONG

Both are airway secretions — encourage cough for either.



✓ RIGHT

Have patient cough. Rhonchi CLEAR or change. Pleural rubs DO NOT clear with cough and disappear with breath-holding. Pleural rub = inflammation, treat pain & cause, not secretions.

TRAP 05 • SUDDEN UNILATERAL ABSENT SOUNDS POST-TRAUMA

Scenario: Patient with chest trauma now has absent breath sounds on the right, dyspnea, and dropping BP.

x WRONG

Give a bronchodilator and reassess in 15 minutes.



✓ RIGHT

Tension pneumothorax — life-threatening. Call rapid response, prepare for needle decompression at 2nd

ICS midclavicular or 5th ICS midaxillary, followed by chest tube. Apply oxygen.

TRAP 06 • COPD PATIENT ON OXYGEN

Scenario: COPD patient is hypoxic with diffuse wheezes; SpO₂ is 84% on room air.

✗ WRONG

Withhold oxygen — high oxygen will eliminate the hypoxic drive and cause apnea.

→

✓ RIGHT

Apply oxygen. Hypoxia kills first. Titrate to SpO₂ 88–92% in COPD — don't withhold, titrate carefully. Monitor RR for CO₂ retention.

TRAP 07 • BRONCHIAL SOUNDS WHERE THEY SHOULDN'T BE

Scenario: Loud, high-pitched, hollow sounds heard over the right lower lobe.

✗ WRONG

This is a normal finding over the trachea — document and move on.

→

✓ RIGHT

Bronchial sounds in the PERIPHERAL lung = consolidation (pneumonia, mass). Look for egophony, dullness to percussion. Anticipate CXR, cultures, antibiotics.



TAKE ACTION • EDUCATION

Patient & Family Education



Recognize Warning Signs

Teach patients/caregivers to call 911 for sudden severe shortness of breath, blue lips, audible wheezing they can't relieve, or a quiet chest in someone who was wheezing.



Inhaler Technique

Shake MDI, exhale fully, seal lips, slow deep inhale with actuation, hold 10 seconds, wait 1 min between puffs. Use spacer. Rinse mouth after steroids.



Peak Flow Monitoring (Asthma)

Use daily. Green zone (80–100%) = good. Yellow (50–80%) = caution, use rescue. Red (<50%) = emergency, use rescue + call provider.



Smoking Cessation

Single most impactful intervention for all chronic lung disease. Refer to quitlines, nicotine replacement, bupropion, varenicline. Counsel at every visit.



Vaccinations

Annual influenza vaccine; pneumococcal (PCV20 or PCV15 + PPSV23); COVID-19; RSV (older adults & pregnant patients per current CDC).



Positioning & Pacing

Sleep with head of bed elevated for orthopnea. Pace activities. Use pursed-lip breathing for COPD. Splint chest during cough for pleurisy.



Hydration & Secretions

Adequate fluids thin secretions (unless fluid-restricted for CHF). Avoid sedating cough suppressants if cough is productive. Use humidifier.



When to Seek Help

New-onset fever with productive cough; coughing up blood; chest pain with breathing; rescue inhaler used > q4h; can't speak full sentences.



MEMORY BOOSTERS

Mnemonics & Pattern Recognition

C·R·A·C·K

CRACKLES — WHAT CAUSES THEM

- C** CHF / Pulmonary Edema
- R** Rales (old name for crackles)
- A** Atelectasis
- C** Consolidation (pneumonia)
- K** "Kindling" — fibrosis (Velcro crackles)

W·H·E·E·Z·E

WHEEZE — THINK NARROWED AIRWAYS

- W** Whistling, high-pitched
- H** Heard on Expiration mainly
- E** Expiratory phase prolonged
- E** Edema / bronchospasm
- Z** "Zero air" if silent chest — EMERGENCY
- E** Epinephrine if anaphylaxis

S·T·R·I·D·O·R

STRIDOR — UPPER AIRWAY EMERGENCY

- S** Sudden, loud, high-pitched
- T** Trachea / upper airway
- R** Racemic epi (nebulized)
- I** Inspiratory (heard on inspiration)
- D** Don't examine throat (epiglottitis)
- O** Oxygen / position of comfort
- R** Rapid response — escalate now

R·H·O·N·C·H·I

RHONCHI — LARGE AIRWAY SECRETIONS

- R** Rattling, low-pitched
- H** Heard on expiration
- O** Often clears with cough
- N** Need to suction / hydrate
- C** Cough & deep breathe
- H** Hydration thins secretions
- I** Incentive spirometry

P·R·U·B

PLEURAL RUB — INFLAMMATION

- P** Pain with breathing (pleuritic)
- R** Rubbing/grating sound
- U** Unchanged by cough
- B** Breath-hold makes it disappear

A·B·S·E·N·T

ABSENT SOUNDS — FIND THE CAUSE

- A** Air in pleural space (pneumothorax)
- B** Blocked airway (mucus plug, FB)
- S** Secondary to consolidation (severe)
- E** Effusion (pleural fluid)
- N** No air movement (apnea, splinting)
- T** Tube migrated (ETT in mainstem)

PITCH

PITCH TELLS YOU THE AIRWAY SIZE

HIGH = small airways or upper airway tight spot
(wheeze, stridor, fine crackles)

LOW = large airways or pleural surface (rhonchi, coarse
crackles, rub)

TIMING

WHEN IN THE CYCLE?

Inspiration = stridor (upper), fine crackles (alveoli)

Expiration = wheezes, rhonchi

Both = pleural rub, severe wheeze, coarse crackles



NGN • CLINICAL JUDGMENT MEASUREMENT MODEL

Six-Step NCJMM Scenario

CLIENT SCENARIO

A 68-year-old client with a history of CHF and COPD is admitted to the medical unit for shortness of breath. On arrival: HR 118, RR 28, BP 162/94, SpO₂ 86% on room air, T 99.1°F. The nurse auscultates bibasilar fine crackles, faint expiratory wheezes scattered throughout, and a 3+ pitting edema in both lower extremities. Client states "I can't catch my breath, especially when I lay down." Daily weight is up 6 lb from yesterday.

STEP 1 • RECOGNIZE CUES

What's relevant in the data?

Bibasilar fine crackles + 6-lb weight gain + 3+ pedal edema + orthopnea + tachycardia + tachypnea + low SpO₂ → fluid overload pattern. Expiratory wheezes overlaid → "cardiac asthma" from CHF-induced bronchospasm, or COPD component. HR 118, BP 162/94 → sympathetic compensation.

STEP 2 • ANALYZE CUES

What do these cues mean together?

Pattern fits acute decompensated heart failure with pulmonary edema. The wheezes are likely cardiac in origin (or mixed). Crackles in the bases climbing upward = fluid backing up from the left ventricle. The client is hypoxic but not yet in arrest — early-to-mid decompensation.

STEP 3 • PRIORITIZE HYPOTHESES

What's most likely AND most dangerous?

Top hypothesis: Acute decompensated heart failure with pulmonary edema. **Must rule out:** Pneumonia (T 99.1 borderline), PE (sudden dyspnea), COPD exacerbation. Highest priority = oxygenation and reducing pulmonary congestion.

STEP 4 • GENERATE SOLUTIONS

What interventions could help?

Position high-Fowler's; apply oxygen (titrate to ≥ 88% given COPD history); IV access; anticipate IV furosemide, nitroglycerin, possibly low-dose morphine; obtain ABG, BNP, troponin, CXR; place on cardiac monitor; daily weights; strict I&O; fluid restriction.

STEP 5 • TAKE ACTION

What does the nurse actually do first?

Sit client up (high-Fowler's), apply oxygen via nasal cannula starting at 2 L/min titrated to SpO₂ 88–92% given COPD history, establish IV access, notify provider with SBAR, prepare to administer IV furosemide as ordered, continuous SpO₂ + cardiac monitoring, reassess lung sounds and vitals every 15 minutes.

STEP 6 • EVALUATE OUTCOMES

Did the interventions work?

Expected within 30–60 min: SpO₂ > 90%, RR < 24, urine output > 30 mL/h after diuretic, crackles diminishing upward, BP lower, client states easier breathing. **Red flags requiring escalation:** rising crackles, falling SpO₂, new confusion, sudden

silence of wheezing, hypotension — call rapid response.

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