Oxygenation, asthma and COPD

Hypoxia, oxygen devices, suctioning, asthma action plans, COPD oxygen

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1 AT A GLANCE

Restlessness, not a blue face, is the first sign a client can't get enough oxygen. Asthma comes and goes; COPD only gets worse.

Hypoxia and pulse oximetry

- Early: anxiety, **restlessness**, confusion, a rising heart rate.
- Worsening: consciousness falls, breathing speeds up, the saturation drops.
- Late: blue around the lips and mouth. Clubbed fingertips mean chronic hypoxia.
- High carbon dioxide: fast pulse, flushed skin, headache, confusion.
- SpO2 target: usually 95% and above in adults; with COPD and carbon dioxide retention, often 88 to 92%, as prescribed.
- False readings: motion, skin pigmentation bias, cold fingers, poor circulation. Warm the hand, or use an ear, forehead or nose probe. Carbon monoxide gives a falsely high reading.

Oxygen in COPD

- ★ Aim for the prescribed saturation, usually **88 to 92%**.
- ★ Titrate the device and flow to that target and the blood gases: **no default ceiling**.
- Why: too much oxygen can depress breathing and raise carbon dioxide further.
- Monitor the saturation, breathing rate and alertness closely, and adjust within the target.
- Long-term home oxygen needs stable, confirmed severe hypoxemia plus clinical criteria, not a single saturation reading.

Oxygen devices

Device	Flow	Key points
Nasal cannula	Commonly 1 to 6 L/min	Client can eat and talk. Pad the tubing, check nose and ears, never petroleum jelly
Simple mask	A minimum flow, commonly 5 L/min, per the manufacturer	So the client doesn't rebreathe carbon dioxide
Non-rebreather	10 to 15 L/min	High oxygen levels without a breathing tube. Inflate the bag first; it should never deflate completely: if it does, act at once
Venturi mask	Correct adaptor and flow; enough total flow	Often for COPD. Gives the selected oxygen percentage only when set up that way
High-flow cannula	Up to 60 L/min	Heated, humidified oxygen, for critically ill clients
★ **Bag valve mask (adult)**	15 L/min	Pulse but inadequate breathing: **1 breath every 6 seconds**. Arrest without an advanced airway: **30:2**

Follow policy: Each device has its own flow: follow the manufacturer's instructions. Under agency protocol, the nurse can start oxygen without an order, then call the provider or rapid response. Recheck within minutes; escalate if there's no improvement.

Asthma action plan

Zone	What it means	What to do
Green	80% of personal best or more; no symptoms	Keep taking the controllers. If exercise is a trigger, the plan may add quick-relief before exercise
★ **Yellow**	**50 to 79%**, or coughing, wheezing or waking at night	Add the quick-relief inhaler, possibly an oral steroid, and call the provider
Red	**Peak flow under 50% of personal best**, or very short of breath with quick-relief not helping	Quick-relief and an oral steroid, and call. Still red after 15 minutes, with no provider reached: go to the emergency department
Call 911	Trouble walking or talking, or blue lips or nails	Another quick-relief dose and a 911 call

Peak flow: Peak flow compares how fast air is blown out with the client's personal best. Every client with asthma should have a written action plan.

Asthma drugs

- Usually, quick-relief drugs like albuterol treat an attack; controllers prevent attacks.
- ★ In some plans, the **reliever is an inhaled steroid with formoterol**.
- Inhaled corticosteroids are the base: take them exactly as prescribed, even when well; rinse and spit after each use to prevent thrush.
- A long-acting bronchodilator (LABA) is only used for asthma together with an inhaled steroid.
- Montelukast: watch for mood or behavior changes, and report them.
- Metered-dose inhaler: shake, breathe out, seal the lips, press while breathing in slowly and deeply; other types differ. Hold about 10 seconds; wait a minute before a second puff.

Educational use only. Not a substitute for clinical judgment, your facility's policy or the provider's orders. Where practice varies, follow facility policy and state law. No patient information.

Oxygenation, asthma and COPD

1 AT A GLANCE, CONTINUED

COPD

- Long-term airflow obstruction: progressive and incurable. Smoking is the main cause, and stopping is the most important treatment.
- Chronic bronchitis: a productive cough at least 3 months a year, 2 years in a row. Emphysema: trapped air; the lungs overinflate. Most clients have both.
- Stable COPD: some clients have compensated respiratory acidosis, but many have a normal carbon dioxide.
- Flare-up, often from infection: worse breathlessness and a saturation below baseline; with infection, fever, more cough, thick discolored sputum. Report it promptly.
- Teach pursed-lip and belly breathing with a return demonstration. Ipratropium can cause a dry mouth.

Suctioning (adult)

Step	Rule
★ **Pressure**	**100 to 150 mmHg**, never above 150
First	Assess. Oxygenate before nasal and tracheal suctioning
Technique	Insert without suction; suction only while withdrawing and rotating
Each pass	No more than 10 to 15 seconds; 30 to 60 seconds of recovery between
Tracheostomy	Sterile. 100% oxygen for 30 to 60 seconds first; limit it to two passes

Pulmonary hygiene: Incentive spirometer: slow, deep breath in, hold at least 5 seconds; repeat as ordered, commonly 10 times an hour while awake.

2 PRIORITY AND SAFETY CALLS

★ Restlessness, anxiety or confusion can be early hypoxia: act. **Don't wait for cyanosis**; it's a late sign.

★ A **silent chest** in an asthma attack means almost no air is moving: treat it as an emergency.

Heart rate drops during suctioning: stop suctioning and oxygenate the client, then assess again.

Non-rebreather bag collapses completely with each breath: a problem that needs action right away.

Calm, pink client with cold hands and a low finger reading: warm the hand or use an ear probe, then recheck.

Status asthmaticus: oxygen, nebulized bronchodilators and steroids. The steroid route and IV magnesium depend on severity and response.

During any attack: sit the client upright, coach pursed-lip breathing, give the prescribed drugs, and check that they work.

Oxygen makes fires start and spread more easily: no smoking, at least 6 feet from heat and open flame (farther if the supplier or facility says so), no sparks from electric razors or hair dryers.

Oxygen is a medication: don't change it without the provider or respiratory therapist.

3 EXAM ANCHORS

1. Restlessness and confusion come early; cyanosis is late.
2. A simple mask run under its minimum flow (commonly 5 L/min) is a trap.
3. Suction at 100 to 150 mmHg, only while withdrawing, 15 seconds at most per pass.
4. Usually quick-relief treats an attack; a slow controller for an attack is a trap.
5. Yellow zone: 50 to 79% of personal best, or symptoms. Add rescue and call.
6. A quieter chest read as better is a trap: a silent chest is an emergency.
7. COPD: oxygen titrated to the prescribed target, usually 88 to 92%. Oxygen above the target is a trap.

4 SELF-QUIZ

1. The first sign of hypoxia isn't a blue face; it's _____.
2. Keep adult suction pressure between 100 and _____ mmHg.
3. A non-rebreather runs at 10 to _____ L/min.
4. Carbon monoxide gives a falsely _____ SpO2 reading.
5. The yellow zone is 50 to _____ percent of personal best.
6. After an inhaled steroid, rinse and _____ to prevent thrush.
7. In COPD, aim for the prescribed saturation, usually 88 to _____ percent.

ANSWER KEY 1. restlessness · 2. 150 · 3. 15 · 4. high · 5. 79 · 6. spit · 7. 92

5 SOURCES

1. Open RN, Nursing Skills 2e, 11.3 Oxygenation Equipment. wtcs.pressbooks.pub/nursingskills/chapter/11-3-oxygenat…
2. Open RN, Nursing Skills 2e, 11.2 Basic Concepts of Oxygenation. wtcs.pressbooks.pub/nursingskills/chapter/11-2-basic-co…
3. Open RN, Nursing: Health Alterations, 6.5 Asthma. wtcs.pressbooks.pub/healthalts/chapter/6-5-asthma
4. Open RN, Nursing: Health Alterations, 6.6 COPD. wtcs.pressbooks.pub/healthalts/chapter/6-6-copd
5. GOLD Report and Pocket Guide (2026). goldcopd.org/2026-gold-report-and-pocket-guide
6. GINA Summary Guide (2026). ginasthma.org/2026-gina-summary-guide
7. American Heart Association, Adult Basic Life Support guidelines. cpr.heart.org/en/resuscitation-science/cpr-and-ec…
8. AARC clinical practice guideline, artificial airway suctioning. aarc.org/wp-content/uploads/2022/10/cpg-arti…

Built from RN PocketPal course lessons: Oxygenation, suctioning and pulmonary hygiene (c09-l01); Asthma and COPD (c09-l02). Every line on this sheet comes from those lesson scripts.

RESPIRATORY

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