ICU REACH

ICR-COPD-016

Pulmonary · critical care

Updated 20 Jun 2026

CRITICAL CARE ORDER SET

Acute Exacerbation of COPD

ICU / step-down management of AECOPD with acute-on-chronic hypercapnic respiratory failure. Controlled oxygen to 88–92%, early NIV, and the bronchodilator–steroid–antibiotic triad are the backbone — escalate to intubation on clear failure criteria, and ventilate the obstructed lung with a long expiratory time and permissive hypercapnia. Adapt every dose to your institutional protocol and the patient in front of you.

PATIENT	MRN	WEIGHT (KG)	CO_2 RETAINER?
ALLERGIES	BASELINE FEV_1 / HOME O_2	ORDERING CLINICIAN	DATE / TIME

01 Admission & level of care

- [ ] **Admit to:** [ ] step-down / intermediate care [ ] ICU — depending on need for NIV, pressors, or intubation risk
- [ ] Diagnosis: **acute exacerbation of COPD with acute-on-chronic hypercapnic respiratory failure**

MONITORING

- [ ] Continuous pulse oximetry
- [ ] Cardiac telemetry
- [ ] Vital signs **q1–2 h** initially, then per stability
- [ ] Strict I/O, daily weights

02 Initial labs & imaging

BASELINE LABS

- [ ] CBC with differential, BMP (incl. BUN/Cr), Mg, phosphate
- [ ] **VBG or ABG on admission**; repeat after significant changes in respiratory support
- [ ] LFTs if considering certain antibiotics
- [ ] hs-troponin and BNP / NT-proBNP if concern for ACS or HF
- [ ] Procalcitonin (optional, if it informs antibiotic decisions at your site)
- [ ] Coagulation panel if on anticoagulants or considering procedures

OTHER TESTS

- [ ] 12-lead ECG
- [ ] Chest x-ray (portable AP)
- [ ] Sputum Gram stain & culture (if purulent sputum and moderate–severe exacerbation)
- [ ] COVID-19 / respiratory viral panel (per local practice)
- [ ] Blood cultures × 2 if febrile, hypotensive, or septic

03 Respiratory support & oxygen

TARGET Goal SpO_2 **88–92%** — avoid over-oxygenation to prevent worsening hypercapnia.

- [ ] Titrate supplemental oxygen to maintain SpO_2 88–92% — nasal cannula, Venturi mask, or HFNC as appropriate
- [ ] For known chronic CO_2 retainers, be explicit: **"Do not target SpO_2 > 92%."**

04 Noninvasive ventilation (NIV: BiPAP)

INDICATIONS

- [ ] Acute / acute-on-chronic hypercapnic failure, pH ≤ 7.35 with elevated $PaCO_2$
- [ ] Moderate–severe dyspnea with accessory muscle use / paradoxical

CONTRAINDICATIONS — FAVOR INTUBATION

- [ ] Cardiac or respiratory arrest
- [ ] Can't protect airway, severe encephalopathy / agitation (GCS ≤ 8–10)

breathing

- [ ] Persistent hypoxemia or hypercapnia despite supplemental O_2

- [ ] Hemodynamic instability or life-threatening arrhythmia
- [ ] Copious secretions, high aspiration risk, recent upper GI surgery, facial trauma, poor mask fit

NIV ORDERS — BIPAP

Initial settings — typical starting point

- [ ] **IPAP 10–15 cm H_2O** (start ~12; titrate up q10–15 min to 18–20 max as tolerated → RR < 25, improved V_t, lower $PaCO_2$)
- [ ] **EPAP 4–6 cm H_2O** (start ~5; titrate for oxygenation, keep driving pressure ≥ 5)
- [ ] **FiO_2** adjust to maintain SpO_2 88–92%

TITRATION

- [ ] ↑ IPAP by 2–3 cm H_2O q10–15 min for persistent tachypnea, hypercapnia, or ↑ WOB if tolerated; adjust EPAP for oxygenation while watching hemodynamics

USAGE

- [ ] Continuous for first 1–2 h, then breaks for nutrition / meds / comfort as tolerated; reassess status & gas exchange within 30–120 min of initiation or any major change

MONITORING

- [ ] Continuous SpO_2 and telemetry
- [ ] RN to document RR, accessory muscle use, LOC at least **q1 h** initially
- [ ] ABG / VBG **1–2 h** after starting NIV and with major changes or deterioration

05 Criteria for escalation to intubation

WORSENING OR PERSISTENT — ANY OF

- [ ] pH < 7.25 with rising $PaCO_2$ despite optimal NIV
- [ ] Inability to tolerate NIV (agitation, repeated mask removal)
- [ ] Hemodynamic instability, new arrhythmias, or shock
- [ ] Severe / worsening hypoxemia (PaO_2 < 55 mmHg or SpO_2 < 88% on high FiO_2)
- [ ] Deteriorating mental status (somnolence, confusion, unsafe agitation)
- [ ] Inability to clear secretions or impending airway compromise

If any present → notify ICU / attending STAT and prepare for intubation.

06 Invasive mechanical ventilation

6.1 · PRE-INTUBATION ORDERS

- [ ] NPO
- [ ] ≥ 2 peripheral IVs (or central line if indicated)
- [ ] Airway equipment: intubation tray, video laryngoscope, backup airway
- [ ] Preoxygenate: 100% O_2 via NIV or HFNC as tolerated
- [ ] Hemodynamic prep: consider 250–500 mL crystalloid bolus if not volume overloaded; vasopressors available at bedside if borderline BP

6.2 · INTUBATION MEDICATIONS (RSI; ADJUST PER PATIENT)

Induction

- [ ] Etomidate **`0.3 mg/kg IV`** once

OR

- [ ] Ketamine **`1–2 mg/kg IV`** once (preferred if bronchospasm / hypotension risk)

Neuromuscular blocker

- [ ] Rocuronium **`1.0–1.2 mg/kg IV`** once

OR

- [ ] Succinylcholine **`1–1.5 mg/kg IV`** once (unless contraindicated)

6.3 · VENTILATOR ORDERS — POST-INTUBATION, COPD PHENOTYPE

Mode & initial settings — example, 70-kg patient

- [ ] Volume A/C (AC-VC) or pressure control; COPD strategy
- [ ] V_t **`6–8 mL/kg PBW`** (~420–560 mL; favor 6–7 in severe obstruction)
- [ ] RR **`10–14/min`** (lower for long expiratory time)
- [ ] I:E ratio ≥ **`1:3`** (adjust inspiratory flow / time)
- [ ] PEEP **`5 cm H₂O`** (cautious; COPD often has intrinsic PEEP)
- [ ] FiO_2 start 1.0, titrate down to SpO_2 88–92%

GOALS / PARAMETERS

- [ ] Accept **permissive hypercapnia if pH ≥ 7.20** (unless contraindicated: raised ICP, severe RV failure)
- [ ] Monitor for dynamic hyperinflation (rising plateau/peak pressures, hypotension, auto-PEEP)
- [ ] Post-intubation ABG within 30 min of stable settings, then per course

Sedation & analgesia — analgesia first, then sedation; RASS −1 to 0

- [ ] Fentanyl IV infusion **25–200 mcg/h** with boluses as needed
- [ ] Plus propofol **5–50 mcg/kg/min** or dexmedetomidine per hemodynamics & delirium risk
- [ ] DVT and stress ulcer prophylaxis (see Section 10)

07 Bronchodilator therapy

7.1 · SABA — albuterol nebulization

- [ ] **Albuterol 2.5 mg neb q4 h** scheduled, plus **q1–2 h PRN** acute dyspnea / wheezing
- [ ] Use in-line nebulizer for intubated patients

7.2 · SAMA — ipratropium nebulization

- [ ] **Ipratropium 0.5 mg neb q4–6 h** scheduled
- [ ] Often combined with albuterol (e.g., DuoNeb 2.5 mg / 0.5 mg q4–6 h)

7.3 · Inhaler-based therapy — if patient can use inhaler

- [ ] Short-acting bronchodilator MDI with spacer PRN dyspnea (replace / supplement nebs when stable & cooperative)
- [ ] Resume long-acting bronchodilators (LABA / LAMA) when stable

08 Systemic corticosteroids

Standard regimen — non-intubated or NIV

- [ ] **Prednisone 40 mg PO daily × 5 days**
- [ ] If NPO: methylprednisolone **40–60 mg IV daily** (or divided q12) × 5 days, then stop (no taper for short course)

Intubated / ICU — severe exacerbation

- [ ] Methylprednisolone **40–60 mg IV q6–12 h** (e.g., 40 mg q8h) × 48–72 h, then once-daily; total course 5–7 days, adjusting to response & side effects

ADD Glucose monitoring if diabetic, or steroid-naïve with high risk of hyperglycemia.

09 Antibiotic therapy

INDICATION ↑ Sputum purulence **plus** ↑ dyspnea and/or ↑ sputum volume, need for mechanical ventilation or hospitalization, or signs of pneumonia. Modify for local resistance, allergy, QT, and Pseudomonas / MRSA risk.

No Pseudomonas risk, not ICU-level pneumonia

- [ ] Azithromycin **500 mg PO/IV × 1, then 250 mg daily** to complete 3–5 days

OR

- [ ] Doxycycline **100 mg PO/IV q12 h**

OR

- [ ] Amoxicillin–clavulanate **875/125 mg PO q12 h**

Hospitalized, moderate–severe or pneumonia, no Pseudomonas risk

- [ ] **Ceftriaxone 1–2 g IV q24 h** plus azithromycin **500 mg PO/IV daily**
- [ ] Duration typically 5 days (longer if pneumonia or slow response)

Pseudomonas risk — frequent abx, prior Pseudomonas, severe obstruction, recent hospitalization

- [ ] Piperacillin–tazobactam, cefepime, or levofloxacin per local protocol
- [ ] Add MRSA coverage (vancomycin, linezolid) if risk factors or radiographic concern

DOCUMENT Planned duration (e.g., "total 5 days if uncomplicated AECOPD").

10 Supportive care & prophylaxis

DVT prophylaxis

- [ ] Enoxaparin **40 mg SC daily**

OR

Stress ulcer prophylaxis — if intubated / high risk

- [ ] Heparin `5000 units SC q8–12 h` (renal failure, high bleeding risk)
- [ ] Pantoprazole `40 mg IV/PO daily` or equivalent

Fluids

- [ ] Maintenance IV fluids only if poor oral intake and not volume overloaded; cautious in cor pulmonale / HF

Nutrition

- [ ] Diet: regular as tolerated if not NPO
- [ ] If intubated: enteral feeding within 24–48 h per ICU protocol

Glycemic control

- [ ] POC glucose AC/HS (or q6 h if NPO / intubated)
- [ ] Insulin sliding scale and/or basal insulin per institutional practice

Smoking cessation & prevention

- [ ] Nicotine replacement therapy as appropriate
- [ ] Pneumococcal & influenza vaccination status review (discharge planning)

11 Sedation / anxiolysis for NIV — optional, use caution

WHEN Severe anxiety / agitation limiting NIV tolerance with no immediate need for intubation — consider very light sedation only.

- [ ] Low-dose IV opioid (e.g., morphine `1–2 mg IV q1–2 h PRN` severe dyspnea) while monitoring mental status & CO_2
- [ ] Avoid heavy benzodiazepines; if absolutely needed, small doses (e.g., lorazepam `0.25–0.5 mg IV`) with continuous monitoring
- [ ] Consider dexmedetomidine in ICU if NIV failure is due to agitation and trying to avoid intubation

12 Home medications & chronic management

RECONCILE

- [ ] Chronic inhalers (LABA / LAMA / ICS), theophylline, roflumilast
- [ ] Anticoagulants, cardiovascular medications
- [ ] Home oxygen and baseline settings

- [ ] Restart chronic COPD regimen as soon as appropriate
- [ ] Arrange pulmonary follow-up and pulmonary rehabilitation referral for discharge

13 Code status / goals of care

EXPLICIT ORDER TO CONFIRM

- [ ] Code status: [ ] Full code [ ] DNR / DNI
- [ ] Willingness to trial NIV only vs intubation and mechanical ventilation
- [ ] Document discussion with patient / surrogates