



ICR-AST-018

Pulmonary · critical care

Updated 20 Jun 2026

CRITICAL CARE ORDER SET

Status Asthmaticus

ICU management of severe, refractory asthma exacerbation. Front-load continuous β -agonists, ipratropium, and early systemic steroids; add IV magnesium and rescue agents for poor responders. If ventilation is needed, protect against dynamic hyperinflation — low rate, prolonged expiration, permissive hypercapnia — and reach for ketamine. Adapt every dose to your institutional protocol and the patient in front of you.

PATIENT -----	MRN -----	WEIGHT (KG) / PBW -----	BASELINE PEF / FEV ₁ -----
ALLERGIES -----	TRIGGER / PRECIPITANT -----	ORDERING CLINICIAN -----	CODE STATUS -----

01 Admission & monitoring

- ☐ Admit to: **ICU / step-down** per institutional criteria — intubated or impending respiratory failure → ICU

MONITORING

- ☐ Continuous cardiac monitoring & pulse oximetry
- ☐ Noninvasive BP **q5–15 min** initially, then per stability
- ☐ Neuro checks **q1–2 h** (esp. on high-dose β -agonists, sedatives, or BiPAP)
- ☐ Respiratory rate & effort **q1 h**
- ☐ Peak expiratory flow (PEF) or FEV₁ if feasible — baseline then **q20–60 min** in early treatment
- ☐ Strict I&O — hourly output if on IV fluids and nephrotoxic agents

DIAGNOSTICS — STAT

- ☐ ABG or VBG with co-oximetry
- ☐ CBC with differential
- ☐ CMP (incl. K, Mg, glucose)
- ☐ Serum magnesium if considering IV MgSO₄
- ☐ Serum lactate (β -agonist effect vs sepsis)
- ☐ Chest x-ray (portable)
- ☐ ECG (baseline — high-dose β -agonists, hypokalemia risk)

AS INDICATED

- ☐ Sputum culture & Gram stain if pneumonia suspected
- ☐ Viral panel / COVID-19 PCR per epidemiology
- ☐ Troponin if concern for myocardial ischemia
- ☐ D-dimer $\pm$ CTPA if PE suspected

02

Oxygen & ventilatory support

TARGET SpO₂ **92–96%** (higher threshold if pregnancy, CAD, or severe anemia).

OXYGEN

- ☐ O₂ via nasal cannula / Venturi / non-rebreather to maintain SpO₂ 92–96%; titrate to lowest FiO₂ achieving goal

NONINVASIVE VENTILATION — IF IMPENDING FAILURE & COOPERATIVE

- ☐ BiPAP — IPAP **10–15** cm H₂O, EPAP **3–5** cm H₂O, FiO₂ to keep SpO₂ 92–96%

MONITOR CLOSELY → PREPARE TO INTUBATE IF

- ☐ Worsening hypercapnia
- ☐ Fatigue / exhaustion
- ☐ Decreasing mental status
- ☐ Hemodynamic instability

INTUBATION — IF CLINICAL DETERIORATION

Indications: worsening hypercapnia with acidosis, exhaustion, altered mental status, refractory hypoxemia, silent chest, hemodynamic instability.

PRE-INTUBATION

- ☐ Full resuscitation status documented
- ☐ Large-bore IV access (2 peripheral or central line); prepare drugs (Section 6)

POST-INTUBATION VENT ORDERS — LUNG-PROTECTIVE, AVOID DYNAMIC HYPERINFLATION

Mode	Volume-control (e.g., assist-control)
Tidal volume	6–8 mL/kg predicted body weight
Respiratory rate	10–14/min (allow permissive hypercapnia)
I:E ratio	Prolong expiratory phase 1:3–1:4
PEEP	0–5 cm H ₂ O (minimal, to avoid hyperinflation)
FiO₂	Titrate to SpO ₂ 92–96%
Plateau pressure	Keep < 30 cm H ₂ O (high peak pressures acceptable)
Permissive hypercapnia	Allow pH down to ~7.20 if hemodynamically tolerated

03

Bronchodilator therapy

Short-acting β_2 -agonist — albuterol (nebulized)

INITIAL

- ☐ 2.5–5 mg nebulized in 3 mL NS q20 min × 3 doses

THEN

- ☐ 2.5–10 mg nebulized q1–4 h PRN

OR

- ☐ Continuous nebulization 10–15 mg/h (up to ~20 mg/h in severe cases, per protocol)
- ☐ Route: mouthpiece / mask; intubated → in-line nebulizer

MONITOR HR, BP, tremor; serum K and lactate with high-dose / continuous use.

Anticholinergic — ipratropium bromide (nebulized)

- ☐ 0.5 mg (500 mcg) nebulized q20 min × 3, then q4–6 h
- ☐ Combine with albuterol ("duonebs") in first 1–2 h

MDI alternative — awake, cooperative patient

- ☐ Albuterol MDI 4–8 puffs (90 mcg) via spacer q20 min up to 4 h, then q1–4 h PRN
- ☐ Ipratropium MDI 4–8 puffs (17 mcg) via spacer q20 min × 3, then q4–6 h

04

Systemic corticosteroids

START EARLY IV initially preferred if severe / ICU. Give within the first hour.

Methylprednisolone (IV)

- ☐ 60–125 mg IV bolus once, then
- ☐ 40–80 mg IV q6–8 h (e.g., 60 mg q6 h or 80 mg q8 h in first 24–48 h)

OR

Prednisone (PO) — if able to take PO, not intubated, less severe

- ☐ 40–60 mg PO once daily

DURATION Typically 5–7 days total; step down per response and transition to PO when improving.

05

Adjunctive therapies

IV magnesium sulfate

Severe exacerbation, poor response to initial inhaled β -agonists / anticholinergics + systemic steroids.

- ☐ 2 g IV in 50–100 mL NS over 20–30 min (single dose)
- ☐ Refractory: some protocols allow 1–2 g IV q6 h $\times$ 2–3 doses (document indications)

MONITOR BP, reflexes, respiratory status; caution in renal impairment.

SC / IM β -agonists — rescue if inhaled route inadequate

EPINEPHRINE IM — ESP. WITH ANAPHYLAXIS OR CANNOT TOLERATE NEBULIZERS

- ☐ 0.3–0.5 mg (0.3–0.5 mL of 1 mg/mL [1:1000]) IM anterolateral thigh; may repeat q5–20 min, max 3 doses

TERBUTALINE SC — IF EPINEPHRINE NOT PREFERRED

- ☐ 0.25 mg SC q20 min $\times$ up to 3, then 0.25 mg q3–4 h PRN

Heliox — if available

- ☐ **70:30 or 80:20** helium:oxygen via tight-fitting mask or ventilator in selected cases
- ☐ Persistent severe bronchospasm with difficulty ventilating despite other measures; requires institutional protocol & monitoring

06

Sedation, analgesia & paralysis — intubated patients

SEDATION

Ketamine — favored for bronchodilation

- ☐ Induction / intubation: **1–2 mg/kg IV** bolus
- ☐ Ongoing sedation: infusion **0.5–2 mg/kg/h** (some protocols 0.25–1 mg/kg/h)
- ☐ Monitor for hypertension, tachycardia, hallucinations / emergence reactions

Propofol — hemodynamically stable

- ☐ Optional load **0.5–1 mg/kg IV**; infusion **5–50 mcg/kg/min**, titrate to RASS –1 to –2
- ☐ Monitor for hypotension, hypertriglyceridemia with prolonged use

Fentanyl — analgesia ± sedation

- ☐ Bolus **25–100 mcg IV q5–15 min** PRN; infusion **25–200 mcg/h**, titrated

NEUROMUSCULAR BLOCKADE

USE ONLY In severe, ventilated patients where asynchrony compromises ventilation, and only with deep sedation and continuous monitoring.

- ☐ **Cisatracurium** — bolus **0.1–0.2 mg/kg IV**; infusion **1–3 mcg/kg/min**, titrate to train-of-four & synchrony
- ☐ **Rocuronium** — intubation bolus **0.6–1.2 mg/kg IV**; intermittent boluses or infusion per ICU protocol

ENSURE WHILE PARALYZED

- ☐ Continuous sedation · eye care · DVT prophylaxis · PUD prophylaxis

07

Fluids & hemodynamic support

IV ACCESS

- ☐ At least two large-bore peripheral IVs
- ☐ Consider arterial line for frequent ABGs / hemodynamic monitoring if severe

FLUIDS

- ☐ Maintenance isotonic crystalloid (0.9% NS or balanced) at **75–125 mL/h**, adjust for volume status / age / cardiac function
- ☐ Bolus **250–500 mL** isotonic crystalloid for hypotension; repeat while evaluating for shock, dynamic hyperinflation, or tension pneumothorax

VASOPRESSORS — IF HYPOTENSION PERSISTS

- ☐ **Norepinephrine infusion** — start **0.02–0.05 mcg/kg/min**, titrate to MAP $\geq$ 65 mmHg

PITFALL New hypotension after intubation — rule out dynamic hyperinflation (disconnect & allow full exhalation) and tension pneumothorax before escalating pressors.

08

Electrolyte, glucose & supportive care

ELECTROLYTES — HYPOKALEMIA COMMON WITH HIGH-DOSE B-AGONISTS

TARGET K $\geq$ 4.0 mEq/L · Mg $\geq$ 2.0 mg/dL

- ☐ KCl **10–20 mEq IV over 1 h** × as needed (rate per central vs peripheral line & institutional limits)
- ☐ Magnesium sulfate **1–2 g IV over 1 h** for hypomagnesemia (distinct from bronchodilator-dose Mg)

GLUCOSE — HYPERGLYCEMIA FROM STEROIDS & B-AGONISTS

- ☐ POC glucose q4–6 h
- ☐ Sliding-scale insulin or insulin infusion per ICU protocol if persistent $>$ **180 mg/dL**

DVT prophylaxis

- ☐ Enoxaparin **40 mg SC daily**

GI prophylaxis — if vent / high-dose steroids

- ☐ Pantoprazole **40 mg IV/PO daily**

☐ Heparin **5000 units SC q8–12 h**

☐ Or famotidine per protocol

NUTRITION

- ☐ NPO initially if intubation likely / unstable
- ☐ Start enteral nutrition within **24–48 h** if intubated and stable

09 Infection evaluation & antibiotics

NOTE Status asthmaticus alone does **not** mandate antibiotics.

IF SUSPECTED PNEUMONIA OR INFECTION

- ☐ Sputum culture; blood cultures if febrile or septic
- ☐ Empiric antibiotics per local CAP / HAP / VAP guidelines, weight- and renal-adjusted

10 Resumption / optimization of chronic therapy

Once stabilized and transitioning out of status asthmaticus:

- ☐ **ICS + LABA** — e.g., budesonide-formoterol **160/4.5 mcg, 2 puffs BID** (adjust per formulary / prior regimen)
- ☐ **Leukotriene receptor antagonist** — montelukast **10 mg PO daily** (evening)
- ☐ Asthma action plan, allergy assessment, smoking cessation, vaccination review prior to discharge

EDUCATIONAL USE ONLY

Not a substitute for clinical judgement. Verify doses, allergies, renal function, and contraindications. Adapt all agents, targets, and thresholds to your institutional protocols, formulary, and the individual patient.

Spreading knowledge
Improving outcomes

