

Management of Life-Threatening Asthma in the Emergency Department

Step One

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Continuous nebulized albuterol 2. Nebulized ipratropium bromide 3. Methylprednisolone 125 mg (1.5 mg/kg) IV 4. Magnesium sulfate 2 g (50 mg/kg, max 2 g) IV 5. Nebulized epinephrine | <p>Use oxygen for nebulization not room air
8 liters per minute
Nebulizer will need to be refilled every 10-15 min
Dose is not important, keep making smoke</p> <p>500 mcg, added to albuterol q20 min x 3, then q1h</p> <p>Alternative: Dexamethasone 20 mg IM or IV</p> <p>Give over 20 minutes</p> <p>0.5 mL of 2.25% racemic epi in 3 mL NS or 5 mL of standard 1:1000 L-epinephrine (1 mg in 1 mL)</p> |
|---|--|

Consider the differential

- CHF
- Pneumothorax
- ACS
- Arrhythmia
- Pulmonary embolism
- Airway obstruction / Foreign body
- Pericardial tamponade

IF NO IMPROVEMENT

Step Two

1. Epinephrine 0.5 mg (.01 mg/kg, max 0.5 mg) IM
 - Proper concentration of epi for IM injection is 1:1000 (1 mg in 1 mL), so 0.5 mg = 0.5 mL
 - May repeat q10 min, or start IV drip at 5 mcg/min and titrate to effect
 - Instant epi drip: 1 amp crash cart epi (1 mg in 10 mL) in 1 liter NS, start at 2 drops/sec, titrate up
 - Alternative to epi: Terbutaline 10 mcg/kg IV bolus over 10 min, then titrate from 0.4 mcg/kg/minute
2. Fluid bolus 20 cc/kg normal saline
3. Diagnostics: Chest X-ray, CBC, chemistry, venous blood gas, HCG, ECG if concern for non-sinus rhythm or cardiac ischemia

Agitated Patient

Ketamine
1.5 mg/kg IV over 30 seconds,
then 1 mg/kg/hour
Titrate drip to effect
If no IV: 5 mg/kg IM

IF WORSENING

Non-Invasive Ventilation
Inspiratory support / IPAP / PS: 8 cm H₂O
Expiratory support / EPAP / PEEP: 3 cm H₂O
Continue nebulizer treatments through NIV

IF WORSENING

IF NO IMPROVEMENT

Able to Tolerate NIV?

NO

YES

Step Three

AVOID INTUBATION IF POSSIBLE

Cooperative Patient

Non-Invasive Ventilation
Inspiratory support / IPAP / PS: 8 cm H₂O
Expiratory support / EPAP / PEEP: 3 cm H₂O
Continue nebulizer treatments through NIV

IF WORSENING

Ketamine
1.5 mg/kg IV over 30 seconds,
then 1 mg/kg/hour
Titrate drip to effect
If no IV: 5 mg/kg IM

IF WORSENING

Intubation and Ventilation of the Asthmatic

Indications

Progressive fatigue / respiratory failure
Progressive deterioration of mental status
Cardiac arrest

Technique

Maximize preoxygenation
Optimize for first pass success
Induce while patient is upright
Use largest ETT possible
Be mindful of tendency to bag-mask ventilate too aggressively; this leads to breath stacking

RSI Meds

Ketamine 2 mg/kg +
Rocuronium 1.2 mg/kg or
Succinylcholine 2 mg/kg

Initial Vent Settings

Assist control / Volume control
Respiratory rate 8 breaths/min
Tidal volume 7 mL/kg IBW
PEEP 2 cm H₂O
Inspiratory flow: 90 lpm (or I:E 1:5)
FiO₂ 100%

Plateau pressure is measured by using the **inspiratory pause** function and noting airway pressure during the inspiratory hold

Vent Management

Goal is plateau pressure < 30 cm H₂O
If P_{plat} too high, decrease rate, then tidal volume
Continue nebulized albuterol
Paralyze if needed, deep sedation/analgesia preferred
External chest compression to assist exhalation
Can accept saturation as low as mid 80s (goal ≥ 90%)
Can accept high pCO₂ for several hours (goal pH > 7.15)
Aggressive airway suctioning
Frequent electrolyte checks, watch for hypokalemia
Consider inhalational anesthetic, heliox

If Patient Crashes on Vent

DISCONNECT VENTILATOR

External chest compression to assist exhalation
Bag mask ventilation - do not overventilate
Verify that ETT not displaced / clogged / kinked
Bilateral thorocostomy
Bolus fluid, epinephrine
Consider ECMO/bypass