Ventilator Management (COPD/Asthma)

Acute Exacerbation of Obstructive Lung Disease?

- NO → Exit algorithm
- YES → Obtain ABG/VBG: pH < 7.25 or with primary respiratory acidosis or significant work of breathing despite optimal medical therapy.

- NO → Continue medical management and exit algorithm
- YES → Strongly consider trial of NIPPV. Is patient a candidate? [BOX 1]

- NO → Initiate NIPPV. Reassess and repeat VBG at 30-60 min. Has patient failed NIPPV? [BOX 2]

- NO → Continue medical management and exit algorithm
- YES → Intubate

**Asthma**

Initial Settings:
- Mode: VC, PC, or SIMV
- Targets:
  - TV 6-8 mL/kg IBW
  - RR 8-10
  - I:E 1:4-5
  - PEEP 5*
  - FiO2: 100%

**COPD**

Initial Settings:
- Mode: VC, PC, or SIMV
- Targets:
  - TV 6-8 mL/kg IBW
  - RR 10-12
  - I:E 1:4-5
  - PEEP 5*
  - FiO2: 100%

Post-intubation:
- Confirm tube placement.
- Initiate post-RSI sedation per department standard of care. Repeat ABG/VBG at 30 min.

Early and frequent reassessment, troubleshooting as needed. [BOX 3]

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**Box 1: Contraindications for NIPPV**
1. Hemodynamic instability
2. Inability to tolerate/cooperate (ie AMS, Anxiety, severe N/V)
3. Inability to follow commands
4. Significant facial instability precluding use of face mask

**Box 2: Indicators of NIPPV failure**
1. Developing hemodynamic instability
2. Severe persistent tachypnea OR new bradypnea
3. Worsening mental status
4. Continued uncompensated respiratory acidosis at reassessment despite optimal IPAP and EPAP settings on NIPPV.
   - If settings are inadequate and no other indicators of failure of NIPPV are present (see #1-3), consider change in IPAP and/or EPAP settings with close monitoring and repeat reassessment at 30-60 min.

**Box 3: Troubleshooting**
1. Treat underlying disease aggressively
2. Initial management: DOPES
   - D: dislodgment → assess tube
   - O: obstruction → suction
   - P: PTX → U/S, needle, CXR
   - E: equipment → check circuit
   - S: stacked breaths → disconnect circuit
3. See Boxes A-F next page
### Box 3A: If .... Hypoxia
1. Increase FiO2 to target SpO2 90-94% (decrease FiO2 ASAP to minimum effective FiO2 once target achieved).
2. Strongly consider placing arterial line & obtaining ABG if pulse-ox unreliable, refractory hypoxia, or clinical concern for additional underlying parenchymal disease. Modify FiO2 as above with target PaO2 60-80, repeat ABG q30-60 min prn.
3. Consider increasing PEEP by increments of 1-2 to max of 10 ONLY if Pplat <30 (see Box 3E), and only continue if effective.
4. Troubleshoot ETT - recall DOPES.

### Box 3B: If .... Tachypnea
1. Consider increasing sedation until patient synchronous with ventilator.
2. Consider chemical paralysis only if refractory to increased sedation or complications of sedation (i.e., hypotension).

### Box 3C: If .... Auto PEEP/Air Trapping
1. Consider increasing PEEP in increments of 1-2 to max of 10 until auto-PEEP resolves.
2. Consider decreasing RR to no less than 6 bpm and reassess ventilation with VBG.
3. If also hemodynamic instability, consider disconnecting circuit to relieve air trapping.

### Box 3D: If .... Acidosis (pH < 7.2)
1. If no air trapping, consider increasing RR and reassess ventilation with VBG.
2. Consider increasing TV by 1-2 mL/kg IBW to max 8 mL/kg IBW ONLY if Pplat <30. Reassess plateau pressure to ensure <30 and reassess ventilation with VBG.
3. If continued critical acidosis, strongly consider placing arterial line and following ABGs.

### Box 3E: If .... Elevated Pplat (>30)
1. Decrease TV to no less than 4-5 mL/kg IBW until Pplat <30 and reassess ventilation with VBG.
2. Consider transition to PC mode, with upper limit of PC = 30 and reassess ventilation with VBG.

### Box 3F: If .... Hypotension
1. Assess volume status, and consider IVF resuscitation if clinically indicated.
2. Assess sedation, consider lightening sedation as tolerated (see Box 3B).
3. High suspicion for: PTX (recall DOPES), air trapping (see box 3C)