Clinical application of noninvasive ventilation

Start

Does patient meet inclusion criteria? (See last page)

Yes

Go to Start on page 2

No

Place patient on a non-rebreather mask with 100% FiO₂

Consider other treatment options, including intubation

End

Important: Guidelines are intended to serve as a reference only. They should be used in conjunction with the instructions and/or protocols set forth by the physician and institution that use noninvasive ventilation (NIV). These guidelines are not intended to override established medical protocols or policies and procedures.
Patients with acceptable limits

Start

Does patient meet inclusion criteria? (See last page)

Yes

Does patient have any exclusion criteria? (See last page)

Initial settings:
- Use oronasal mask
- Start with CPAP 5 cmH₂O
- Titrate FiO₂ to SpO₂ ≥ 90%

Monitor patient

Is patient’s monitored data within acceptable limits? (See last page)

Yes

No (Go to page 3)

Setting adjustments for deterioration in patient condition or until stabilization is reached:

**CPAP**
- Increase positive airway pressure by 2 cmH₂O until patient condition stabilizes or until 10 cmH₂O is reached

**BiLevel**
- If CPAP level of 10 cmH₂O is reached, change to BiLevel of peak inspiratory pressure of 10 cmH₂O and 5 cmH₂O of peak end-expiratory pressure
- Increase peak inspiratory pressure by 2 cmH₂O until patient condition stabilizes

**FiO₂**
- Increase FiO₂ to maintain SpO₂ ≥ 90% or per protocol

Adjustments to improve patient compliance:
- Coaching
- Mask fitting
- Sedating

Setting adjustments for improved patient condition:

**CPAP**
- Decrease peak end-expiratory pressure by 2 cmH₂O

**BiLevel**
- Decrease inspiratory pressure by 2 cmH₂O

**FiO₂**
- Decrease FiO₂ to maintain SpO₂ ≥ 90% or per protocol

Continue to monitor
Patients with acceptable limits (continued)

Is patient in respiratory failure? (See last page)

Yes

Discontinue NIV

No

Continue to monitor and re-evaluate if patient meets criteria for CPAP or BiLevel—Review other considerations

Place patient on a non-rebreather mask with 100% FiO₂

Consider intubation

End

No

Is patient in respiratory failure? (See last page)

Yes

Discontinue NIV

No

Continue to monitor and re-evaluate if patient meets criteria for CPAP or BiLevel—Review other considerations

Place patient on a non-rebreather mask with 100% FiO₂

Consider intubation

End
Inclusion criteria
• Acute COPD or CPE
• Acute hypercapnic respiratory failure
• Clinical impression of impending intubation
• Moderate to severe dyspnea

Exclusion criteria
• Apnea
• Inability to cooperate
• Airway protection need
• Systolic B/P < 90 mmHg
• Recent facial, esophageal or gastric surgery
• Unstable angina

Monitored data
• Patient comfort
• Mask leak
• Dyspnea level
• Respiratory rate
• Heart rate and blood pressure
• \( \text{SpO}_2 \)
• Accessory muscle usage
• Patient/Ventilator asynchrony
• End-tidal capnography (if available)
• Arterial blood gas after 30–60 minutes

Signs of respiratory failure
• Hemodynamic instability
• Pneumothorax
• Gastric distension
• Vomiting
• Decreased mental status
• Respiratory rate > 35/min
• Inability to maintain \( \text{SpO}_2 \geq 90\% \)
• Inability to tolerate mask

Other considerations
• Noninvasive ventilation may be complemented with drug therapies specified per protocol such as:
  - Diuretics
  - Aerosolized bronchodilators
  - Nitroglycerin

References