

NONINVASIVE VENTILATION

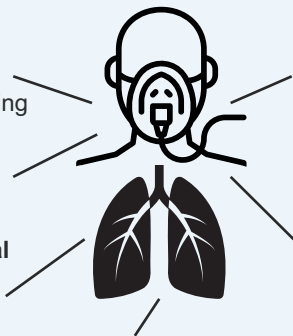
Positive pressure ventilation that is delivered through a nasal, mask, or helmet interface and without the insertion of an invasive airway (such as an endotracheal tube or a tracheostomy)

PHYSIOLOGY

Preserves **airway clearance** and spontaneous breathing

Decreases need for sedation

Increases **functional residual capacity** and opens up atelectasis



Decreases work of breathing by improving **pulmonary compliance** and counteracting intrinsic PEEP in patients with air trapping

Bilevel support **augments inspiratory tidal volumes (Vt)** and improves ventilation

Decreases LV afterload by **decreasing transmural pressures**

PREDICTORS OF SUCCESS

- Ability to cooperate
- Good mask fit/minimal air leak
- Moderate hypercarbia (PaCO₂ 45-92)
- Clinical improvements within first 2 hours

ABSOLUTE CONTRAINDICATIONS

- Cardiac or respiratory arrest
- Inability to fit mask
- Patient intolerance
- Inability to protect airway or clear secretions

RELATIVE CONTRAINDICATIONS

- Hemodynamically unstable
- Rapidly progressing respiratory failure in full-code patient

CPAP

- Continuous positive airway pressure
- Delivers continuous pressure throughout respiratory cycle
- Supports oxygenation

BIPAP

- Bilevel positive airway pressure
- Delivers preset inspiratory and expiratory pressures
- Supports oxygenation and ventilation
- Should monitor Vt and for barotrauma (eg, pneumothorax or pneumomediastinum)

HHFNC

- Heated high-flow nasal cannula
- Delivers heated humidification, increasing tolerance to flows above those provided by traditional nasal cannula.
- Supports oxygenation and ventilation by washing out CO₂ from upper airway
- Delivered PEEP is variable and depends on set flow and patients' ability to close mouth

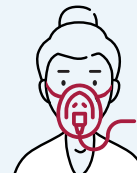
INTERFACES

- Choice of the interface plays major role in determining success, failure, and complications due to degree of tolerance & air leak
- Examples include nasal, facemask (oronasal & full), and helmet
- Need to watch closely for skin breakdown & vomiting

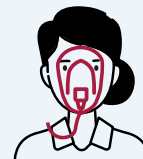
Nasal



Oronasal



Full Facemask



Helmet

