

Noninvasive Ventilation (NIV)

Overview

Noninvasive Ventilation (NIV) is a method of providing positive pressure ventilatory support through a face or nasal mask without an artificial airway, improving oxygenation and/or ventilation while maintaining the patient's natural airway.

Continuous Positive Airway Pressure (CPAP)

Overview

CPAP is a noninvasive ventilation mode that maintains a constant positive airway pressure throughout the respiratory cycle, improving oxygenation by promoting alveolar recruitment and preventing alveolar collapse. Since no inspiratory pressure support is provided, effective ventilation relies entirely on the patient's spontaneous respiratory effort.

USE FOR IMPROVING OXYGENATION

Settings: CPAP 5 - 15 cmH₂O

Indications

- Obstructive Sleep Apnea (OSA).
- COPD with intrinsic PEEP (auto-PEEP).
- Hypoxemic respiratory failure.
- Cardiogenic pulmonary edema.

Management

- Hypoxemia ($\downarrow$ PaO₂): Increase FiO₂ and/or CPAP.
- CPAP is commonly set around 80–90% of measured auto-PEEP in COPD to reduce inspiratory work without worsening hyperinflation.



CPAP = EPAP = PEEP for improving oxygenation
IPAP - EPAP = PSV
For improve ventilation = increase PSV = Increase the difference

Bilevel Positive Airway Pressure (BiPAP)

Overview

BiPAP is a noninvasive ventilation mode that delivers two pressure levels: a higher inspiratory pressure (IPAP) and a lower expiratory pressure (EPAP).

IPAP augments tidal volume and reduces the work of breathing.

EPAP maintains alveolar recruitment and improves oxygenation.

USE FOR IMPROVING OXYGENATION AND VENTILATION

Settings:

IPAP: 10 - 15 cmH₂O

EPAP: 4 - 6 cmH₂O

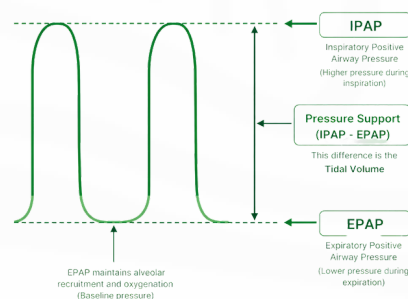
→ Ventilation
→ Oxygenation

Indications

- Acute exacerbation of COPD with hypercapnic respiratory failure
- Acute-on-chronic respiratory failure
- Neuromuscular disorders and chest wall diseases

Management

- **Hypercapnia ($\uparrow$ PaCO₂):** Increase IPAP (increase pressure support).
- **Hypoxemia ($\downarrow$ PaO₂):** Increase FiO₂ and/or EPAP.
- Maintain an adequate IPAP-EPAP difference (Pressure Support) to ensure sufficient tidal volume.



Additional Setting

RR + Ti

Work as a Backup Ventilation.

Ramp

Pressure gradually increases over time to reach the set pressure (allows for the patient to avoid sudden application of pressure when trying to get to sleep).

C - Flex

Feature that temporarily reduces pressure during exhalation to improve patient comfort.