HOW TO USE A VENTILATOR DESIGNED FOR NIV TO PROVIDE INVASIVE VENTILATION

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Disclosures

• Ventec Life Systems
• Daedalus
• Jones and Bartlett
• McGraw-Hill
• UpToDate
CPAP versus Bilevel

• CPAP devices for OSA cannot be repurposed for invasive ventilation.
  • No ventilation support.
  • Difficult to provide high FIO$_2$.

• Bilevel (BiPAP is a brand name)
  • Provide positive pressure ventilation (they are ventilators).
  • Some are FDA-cleared for invasive ventilation.
  • Devices used for home ventilation (nocturnal or continuous) can be repurposed to provide invasive ventilation.
Leak port must be present in circuit
Leak port must be filtered
Humidification: Absolutely Necessary

- blower & pressure controller
- Single limb passive
- leak
- Patient
- HMEF

Active
Settings: Similar to NIV, But With an ARDS Strategy

- **IPAP**: PIP (plateau) \[Driving pressure; tidal volume\]
- **EPAP**: PEEP
- **Mode**: S/T; PC if available
  - Avoid volume-targeted modes and modes for SDB; keep it simple
  - Avoid modes without a backup rate
- **Rate**
- **Inspiratory time**
- **FIO\(_2\)**
Starting Settings

- **IPAP**: 25 cm H$_2$O
- **EPAP**: 12 cm H$_2$O
- **Mode**: S/T; PC okay
- **Rate**: 25/min
- **Inspiratory time**: 0.8 s
- **FIO$_2$**: 1

Driving pressure 13 cm H$_2$O
- Adjust IPAP for tidal volume; target 6 mL/kg PBW (400 mL)
- Adjust IPAP when EPAP changed

Note: These setting are higher than typically used with these ventilators for NIV.
FIO$_2$

- **blower & pressure controller**
- **leak**
- **patient**
- **single limb passive**

**Titration from flowmeter**
- High FIO$_2$ difficult
- FIO$_2$ varies with minute ventilation
- Target flow to SpO$_2$
Monitoring

- Tidal volume: target 6 mL/kg PBW (400 mL)
- SpO₂: target 88% - 95%
- Capnography
  - Issues with leak and disease
  - Might serve as disconnect alarm
  - Not absolutely necessary
- Arterial blood gases
Alarms

• Disconnect
  • Set on device
  • Capnometry

• Tidal volume/minute ventilation

• SpO$_2$

• Additional alarms as available
Triage (If possible)

- ICU ventilators for sickest patients.
- NIV ventilators FDA-cleared for invasive ventilation.
- Bilevel ventilators designed for homecare for least sick patients.
Final Thoughts

• CPAP devices do not provide ventilation.

• Bilevel devices are ventilators.

• Bilevel devices can be used for invasive ventilation.

• The same principles apply to bilevel ventilators for invasive ventilation as for ICU ventilators.