

NON-INVASIVE POSITIVE PRESSURE VENTILATION by Nick Mark MD


onepagericu.com
 @nickmark
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PURPOSE & DEFINITIONS:

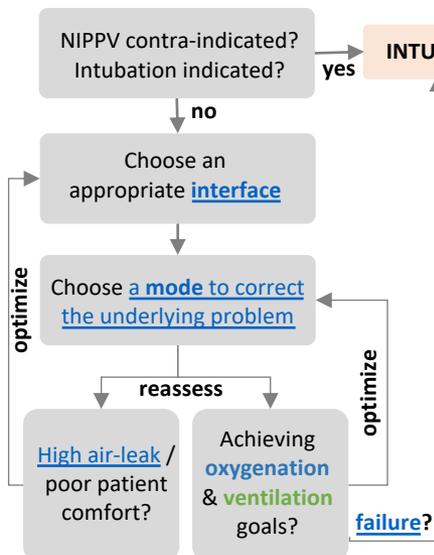
- Non-invasive positive pressure ventilation (NIPPV) is a method of supporting **ventilation** and **oxygenation**. NIPPV can be [used in acute respiratory failure to avoid endotracheal intubation](#). EPAP (expiratory pressure) = PEEP = CPAP

INDICATIONS:

- COPD exacerbation (↓ intubation, ↓ mortality)
- Cardiogenic pulmonary edema (↓ mortality)
- Other causes of respiratory failure
- DNI status
- Extubation to NIPPV

CONTRA-INDICATIONS:

- Unresponsiveness/coma
- Inability to trigger breath
- Inability to protect airway / remove mask
- Risk of emesis / copious secretions
- Recent head/neck surgery



HELMET

May be **better tolerated**, may reduce the **likelihood of requiring intubation, & decrease mortality**. No risk of pressure ulcers.

FULL FACE

Patients can tolerate higher pressures using masks than nasal interface. Full face masks are less likely than partial to cause pressure ulcers, & generally have less air-leak. Comfort is variable.

PARTIAL FACE

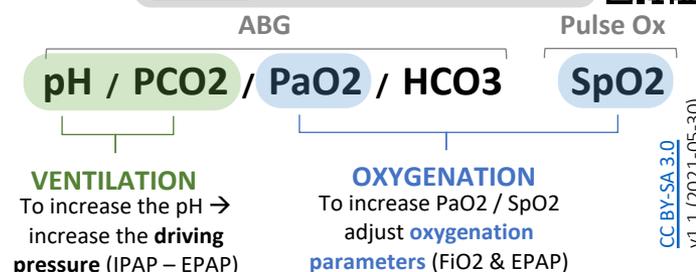
Patients can tolerate higher pressures using masks than nasal interface. Full face masks are less likely than partial to cause pressure ulcers, & generally have less air-leak. Comfort is variable.

NASAL

May be **more comfortable** for CPAP or low pressure. High air-leak. May cause pressure ulcers on nose. Pt can take oral meds easily.

Scalars correspond to pressure, flow, & volume waveforms

(Not all NIPPV devices can be used with heater & humidifier)



Mode	Description	Pro's	Con's	Ventilator settings / example	Monitor
CPAP Continuous positive airway pressure	Delivers a continuous pressure (CPAP == EPAP == PEEP) throughout the respiratory cycle, holding open collapsible airways and improving oxygenation. Patient triggers all breaths.	Improves oxygenation ; relatively well tolerated. Useful in obstructive apneas, reduces intubations in CHF exacerbations.	Does not assist ventilation (risk of hypoventilation)	EPAP, FIO₂ +8, 60%	Ventilation
S/T Spontaneous Timed (a.k.a. BiLevel, BiPAP)	Sets, an inspiratory (IPAP) & expiratory pressure (EPAP). Every breath is supported with positive pressure. Patient triggers breaths, there is also a backup rate. (Similar to pressure support) T - time/pressure/flow, C – flow, L - pressure	Improves ventilation & oxygenation . Useful in COPD to avert intubation & reduce mortality. May also reduce mortality in patients with immunosuppression presenting with hypoxemic respiratory failure .	Can have volutrauma	Backup RR, IPAP, T_i, Risetime, EPAP, FIO₂ 8 bpm, 16 cmH₂O, 1 sec, 0.15 sec, +8, 60%	Ventilation Volumes
AVAPS Adaptive volume assured pressure support (a.k.a. iVAPs)	Hybrid mode that dynamically adjusts inspiratory pressure (IPAP) to deliver a desired tidal volume. (Analogous to PRVC/VC+ modes) T - time/pressure/flow, C – volume, L - volume	Ensures minimum ventilation (within a desired pressure range). Not proven superior	Can have volutrauma With greater patient effort (e.g. gasping) will provide less support.	Backup RR, Goal TV, P_{min}, P_{max}, Risetime, PEEP, FIO₂ 8 bpm, 450cc, 10, 20, 0.15 sec, +8, 60%	Ventilation pressures & volumes