NON invasive ventilation

Non-invasive positive pressure ventilation (NIPPV) refers to the(provision of ventilatory support through the patient's upper airway using a mask or similar device).

This technique is distinguished from those which bypass the upper airway with a tracheal tube, laryngeal mask, or tracheostomy and are therefore considered invasive.

Indications of NIPPV:

1-Management of acute respiratory failure

2-Chronic ventilatory support

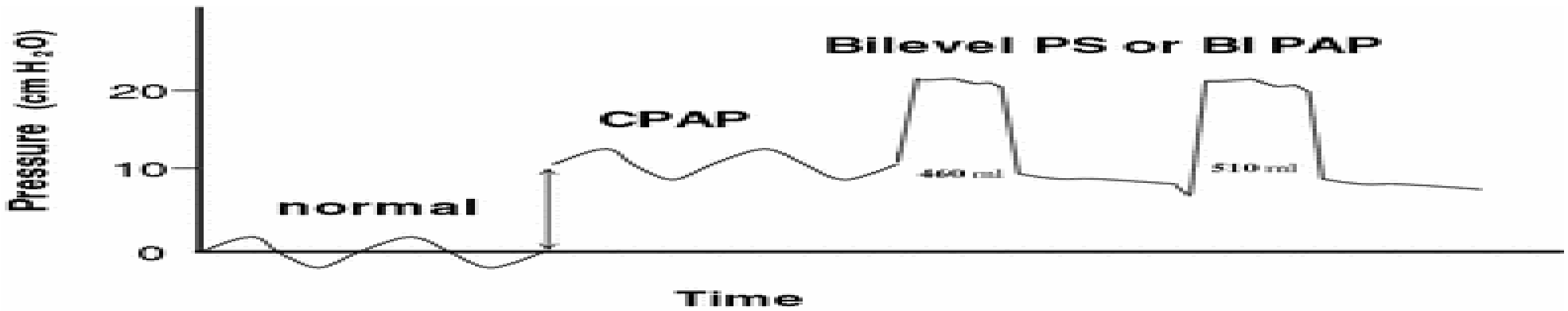
3-As a mean of transition of difficult to wean patients from invasive ventilatory support to spontaneous breathing

there are two most common types of NIPPV :

CPAP for hypoxemic respiratory failure

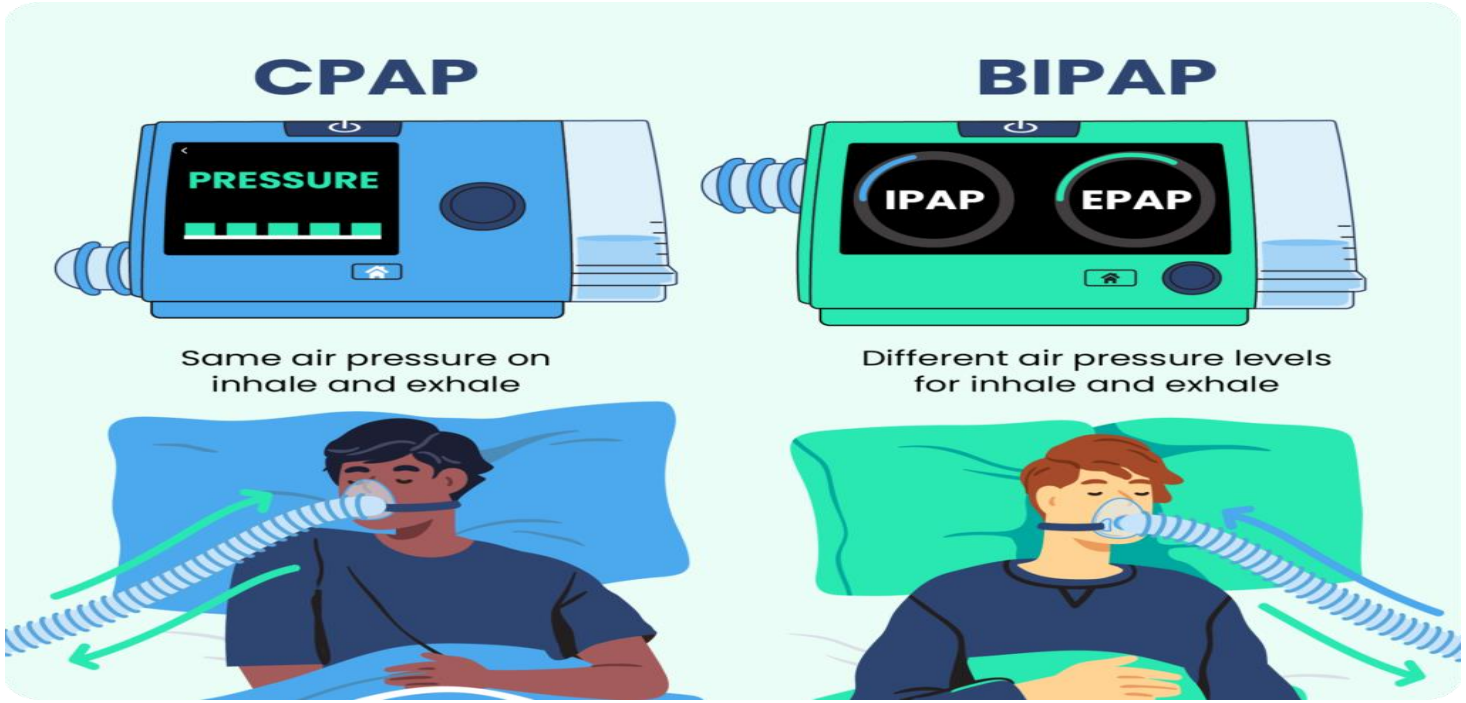
BiPAP for hypercapnic respiratory failure

CPAP	BIPAP
Delivers a continuous stream of pressurised air ➡ Keeps airways open to improve ventilation & oxygenation ➡ Reduces the effort of breathing	Delivers 2 levels of pressure: IPAP during inspiration and EPAP during expiration ➡ Assists with both inspiration and expiration ➡ Reduces CO2 retention ➡ Enhances overall ventilation efficiency



Monitoring of patient on NIPPV:

Initially the clinical progress should be reviewed hourly ,then reduced if the patient being stable.



Regular measurement of :

-Resp.Rate.

-tidal volume

-Work of breathing.

-Oxygen saturation

-Heart rate.

-Arterial blood gas monitoring including $PaCO_2$.

Questions to be asked during monitoring..

Is the patient on too much oxygen?

- Adjust FiO2 to maintain SpO2 between 85% and 90%

• Is there excessive leakage?

- Check mask.

• Is the circuit set up correctly?

-Check connections have been made correctly

-Check circuit for leaks

• Is the patient synchronizing with the ventilator?

- Observe patient

-Adjust rate and/or IE ratio (with assist/control)

Advantages:

1-avoid trauma secondary to endotracheal intubation.

2-avoid risk of ventilator associated pneumonia

3-avoid need to sedation

4-allow patient to communicate.

Disadvantage:

1- patient must be alert and has spontaneous respiration.

2-tight mask fit (no facial hair)

3-feeling of claustrophobia.

4-increase intrathoracic pressure so lead to hypotension.

Contraindications:

Relative :

- hypotension or shock.
- multiple organ failure.
- inability to cooperate.

Absolute :

- cardiac or respiratory arrest.
- facial surgery trauma or deformity.
- upper airway obstruction.
- inability to protect the airway.
- vomiting or upper gastrointestinal bleeding.
- inability to clear airway secretion

Failure of non invasive mechanical ventilation:

- Deterioration in patient's condition
- Failure to improve or deterioration in arterial blood gas tensions
- Development of new symptoms or complications such as pneumothorax, sputum retention, nasal bridge erosion
- Intolerance or failure of coordination with the ventilator
- Failure to alleviate symptoms
- Deteriorating conscious level

Withdrawal of NIV:

The duration of NIV is very variable.

Clinical improvement and stability of the patient's condition are the most important factors in determining when NIV may be safely withdrawn.

- respiratory rate of <24 breaths/min,

-compensated pH >7.35 (H+ <45 nmol/l)

-SpO2 >90% on 40% FiO2

-heart rate <110 beats/min,

Recommendations :

Reusable masks and exhalation valves should be reprocessed in an automated washer/disinfector/drier machine after disassembly into their component parts.

A bacterial filter should be attached to the ventilator outlet during NIV and the external surface of the ventilator cleaned between patients.

thank you