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Respiratory failure in a major abnormality of gas exchange in the main indication of mechanical ventilation. Criteria for gas exchange abnormality include a partial pressure of oxygen (Pao_2) of less than 50 mmHg on room air and/or partial pressure of carbon dioxide ($Paco_2$) of greater than 50 mmHg with Ph below 7.35.

Respiratory failure in defined as "Hypoxemic" characterized by failure of gas exchange, as "Hypercapnic" characterized by failure of ventilatory pump, or combination of both.

The disorders causing acute Hypoxemic respiratory failure may be divided into diffuse lesion such as pulmonary oedema and focal lung lesion such as lobar pneumonia.

Hypercarpnic respiratory failure corresponds to acute ventilatory failure and is characterized by the inability of a failing respiratory pump to provide a level of alveolar ventilation sufficient to meet the required metabolic need

The three subsets of ventilatory failure are loss of adequate drive, impaired neuromuscular competence, and excessive respiratory load.

Patients in acute respiratory failure frequently present to the emergency department. Traditionally management has involved, mechanical ventilation. Via endotracheal intubation. Such invasive forms of treatment however, correlate with a higher incidence of infection, mortality, length of stay and contribute to the costs of intensive care.

Non invasive positive pressure ventilation such as bi-level positive airway pressure (BiPAP) may therefore provide an alternative and preferable form of treatment.

Non invasive ventilation in a form of ventilatory support without resorting to invasive application of positive pressure i-e endotracheal or tracheostomy tube is not needed.

A number of studies using different techniques have shown that several important goals of mechanical ventilation can be achieved non invasively with nasal or full face mask NIPPV. These goals include improvement in oxygenation and alveolar ventilation, reduced work of breathing, and relief of dyspnea.

Non-invasive ventilatory support in currently being used across all setting where ventilatory support in indicate: chronic ventilatory support, management of acute ventilatory failure and as a means to transition of difficult-to-wean patient from invasive ventilatory support to spontaneous breathing.

NIPPV should be avoided in patients with cardiovascular instability, in those who require an endotracheal tube to protect the airways, those with life threatening refractory hypoxemia, or patients with morbid obesity.

Generally all patients requiring long term ventilatory support are candidates for non invasive ventilation if they do not have marked oxygenation problems, are able to mange their secretions without suctioning and do not have upper airway obstruction.

For chronic respiratory failure a wide consensus now favors the use of NIPPV as the ventilatory mode of first choise for patients with neuromuscular diseases and chest wall deformities.

Increasing data have become available supporting the use of NIPPV in the management of patients presenting with acute respiratory failure.

In those patients who meet general weaning criteria but repeatedly fail weaning trials, some investigator recommend extubation followed by NIPPV.

Applying mask CPAP can improve the pathophysiology of status asmaticus (SA) CPAP also decrease the adverse hemodymic effects of large negative swing in mean inspiratory pleural pressure.

NIPPV frequently succeeds in keeping the patients of cystic fibrosis alive until transplantation. Improve the quality of life and decreases the duration of intubation and ICU stay after transplantation.

Recent studies have encouring result with NIPPV in management of sleep apnea, cardiogenic pulmonary oedema postoperative respiratory failure and trauma.

Mask CPAP and NIPPV are effective in (AIDS) patients with pneumocystis carnii (PCP) and ARF.

Pneumonia as a cause of ARF by it self, is not a contraindication to NIPPV if the patient is capable of expectorating secretions effectively.

In COPD patient NIPPV can be used in acute respiratory failure, facilitates difficult weaning, to correct sleep apnea in overlap syndrome.

In patient with severe but stable hypercapnic COPD NIPPV can not recommended except in the select patient who tolerates the equipment and feel its benefits.

Present evidence does not support the addition of NIPPV for normocapnic patients with nocturnal oxygen desaturation but NIPPV might help hypoventilates.

All modes of NIPPV have been used to achieve significant physiological or clinical benefit in (ARF) secondary to acute exacerbations of COPD. ACV (Assist/control ventilation), PSV (pressure support ventilation) and PAV (proportional assist ventilation) have led to improvement in minute ventilation, respiratory rate and arterial blood gases while unloading the respiratory muscles.

NIPPV can be applied with either a nasal mask, full face mask, nasal pillows or mouth piece with lip seal. A mouth piece with lip seal in primarily used for chronic application of NIPPV. For acute and chronic applications, both nasal and full face masks have been used.

Advantages of NIPPV relates to its non invasiveness and to avoiding the complication related to endotracheal intubation and related instrumentation.

Disadvanges of NIPPV relate to the system such as gastric distention, the mask such as an leakage and facial skin necrosis and lack of airway access for suctioning secretion and protection such as aspiration.