

## Non-invasive Oxygenation Strategies for Acute Hypoxaemic Respiratory Failure



Non-invasive oxygenation strategies such as high-flow nasal cannula, continuous positive airway pressure, and non-invasive bilevel ventilation can effectively avoid intubation in patients with acute hypoxaemic respiratory failure. These strategies can be delivered through interfaces like facemasks or helmets. Avoiding unnecessary intubation has become even more highlighted during the COVID-19 pandemic, emphasising the importance of optimising non-invasive strategies.

Several randomised controlled trials have been recently published, evaluating non-invasive oxygenation strategies for treating acute hypoxaemic respiratory failure. These trials aim to prove the effectiveness of various oxygenation techniques and devices. However, the question still remains as to which non-invasive oxygen strategies are effective for acute hypoxic respiratory failure.

A systematic review was conducted to report on mortality, invasive mechanical ventilation, duration of hospitalisation and ICU, ventilator-free days, and comfort. The researchers included 36 trials with 7,046 patients. Their findings show that helmet continuous positive airway pressure (CPAP) reduces mortality compared to standard oxygen therapy. High-flow nasal cannula reduces the need for invasive mechanical ventilation. All non-invasive oxygenation strategies may reduce the duration of hospitalisation compared to standard oxygen therapy with low certainty. Helmet bilevel ventilation and helmet CPAP may reduce the duration of ICU stay compared to standard oxygen therapy, with both having low certainty. Standard oxygen therapy may be more comfortable than face mask non-invasive ventilation, but no difference was observed in comfort compared to high-flow nasal cannula.

Before COVID-19, a previous meta-analysis found that high-flow nasal cannula effectively avoided invasive mechanical ventilation but not mortality in patients with acute hypoxaemic respiratory failure. However, the current study excluded studies enrolling emergency room or post-operative patients and, incorporating evidence from COVID-19 trials, found with low certainty that high-flow nasal cannula also reduces mortality. The study also included data on six patient-important outcomes, including duration of hospitalisation, duration of ICU stay and comfort, which may be more clinically relevant. Further research is needed to better understand the role of these interfaces in acute hypoxaemic respiratory failure, especially in COVID-19.

Overall, findings from this review show that using a helmet interface for non-invasive ventilation is likely to reduce mortality and the risk of mechanical ventilation in acute hypoxemic respiratory failure patients and reduce the duration of hospital and ICU stay. High flow nasal cannula is also likely to reduce the risk of invasive mechanical ventilation and may be as comfortable as standard oxygen therapy. However, further research is needed to fully understand the role of these interfaces.

Source: [Chest](#)  
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