

Acute Hypoxemic Respiratory Failure

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Acute hypoxaemic respiratory failure#

Criteria for immediate or imminent intubation are present (i.e. impaired consciousness and/or persistent shock*)

NO

YES

NHF initiation

- FiO₂ 100%
- Flow rate 60 L·min⁻¹
- Temperature 37°C

Intubation and invasive MV

NHF for improving pre-oxygenation and peri-laryngoscopy oxygenation

- FiO₂ 100%
- Flow rate 60 L·min⁻¹

Within 1-2 h

Monitoring

Presence of one of the following: respiratory rate >35 breaths·min⁻¹, SpO₂ <88-90%, thoraco-abdominal asynchrony and/or persistent auxiliary muscle use, respiratory acidosis (PaCO₂ >45 mmHg with pH <7.35)

NO

YES

Titration*

- FiO₂ based on target SpO₂ (>88-90%)
- Flow rate based on <25-30 breaths·min⁻¹ and patient comfort
- Temperature based on patient comfort.

Noninvasive MV

Short trial (1-2 h)

Monitoring

Monitoring

Presence of one of the following within hours (maximum 48 h), besides optimum NHF titration: respiratory rate >35 breaths·min⁻¹, SpO₂ <88-90%, thoraco-abdominal asynchrony and/or persistent auxiliary muscle use, respiratory acidosis (PaCO₂ >45 mmHg with pH <7.35), haemodynamic instability[§]

NO

YES

Weaning from NHF

Firstly decrease FiO₂. When FiO₂ <0.4 decrease flow rate by 5 L·min⁻¹. When flow rate <15 L·min⁻¹ stop NHF and initiate SOT

Intubation and invasive MV

NHF for improving pre-oxygenation and peri-laryngoscopy oxygenation

- FiO₂ 100%
- Flow rate 60 L·min⁻¹

Recommended algorithm for high-flow nasal cannula use in acute hypoxaemic respiratory failure in immunocompetent or immunocompromised patients. #: arterial oxygen tension (PaO₂)/inspiratory oxygen fraction (FiO₂) <300 (patients with arterial carbon dioxide tension (PaCO₂) >45 mmHg and pH <7.35 are excluded); †: systolic arterial blood pressure <90 mmHg despite adequate fluid administration; +: the rationale for change in nasal high flow (NHF) settings are as follows. 1) The rate could be adjusted downwards by 5-10 L·min⁻¹ per 1-2 h if none of the negative prognostic factors are present. However, if targets of arterial oxygen saturation measured by pulse oximetry (SpO₂) and respiratory rate are not achieved, while the flow rate is <60 L·min⁻¹, increase of flow rate by 5-10 L·min⁻¹ is preferred to raising FiO₂; 2) increase in FiO₂ causes increases in PaO₂ and SpO₂; 3) temperature can be set at 37°C or lower (31-34°C), based on the patient's comfort; §: haemodynamic instability is defined by heart rate >140 beats·min⁻¹ or change >20% from baseline and/or systolic arterial blood pressure >180 mmHg, <90 mmHg or decrease >40 mmHg from baseline. MV: mechanical ventilation; SOT: standard oxygen treatment.

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