Appendix 2: Management of sequential NIV and oxygen therapy

Management of sequential NIV

The following steps will be undertaken:

- Semi-recumbent position
- Naso-buccal (facial) mask as first choice
- Humidification (humidifier or heat and moisture exchanger)
- ICU ventilator with specific NIV mode or dedicated NIV ventilator
- Pressure mode: pressure support ventilation (PSV) + positive end expiratory pressure (PEEP) or bilevel positive airway pressure (BiPAP)

Initial settings

- Inspiratory pressure level (PSV or IPAP: cmH₂O) for expired tidal volume (Vte) between 6 to 8 ml/kg of ideal body weight (IBW)
- Expiratory pressure level (PEEP or EPAP: cmH₂O)
  - between 3 to 5 cmH₂O to counteract a potential intrinsic PEEP
  - between 5 to 10 cmH₂O to counteract a potential intrinsic PEEP and improving oxygenation
- FiO₂ (%) set for a 88% ≤ SpO₂ ≤ 92%

Suggested adjustments to limit patient-ventilator asynchrony

- Rapid ramp flow pressure: 0.20-0.25 sec
- Minimal flow inspiratory trigger: 0.5-1 l/min
- Adjustable flow (40-60%) or timed (1-1.2 sec) expiratory trigger (I/E cycling) secondary adapted to tolerance, air-leaks and ABG controls

Management of oxygen therapy

Standard oxygen therapy

- Interface: nasal cannula, nasal tube or face mask according to the O₂ flow needed and/or tolerance of interface.
- Flow: set for a 88% ≤ SpO₂ ≤ 92%

High-flow heated and humidified nasal oxygen therapy (HFHO)

- Preparation of the device 10 to 15 min before use (to reach the good temperature for tolerance).
- FiO₂: set for a 88% ≤ SpO₂ ≤ 92%
- Gas-flow: set between 50 to 60 L/min according to tolerance.

Procedures to withdraw from HFHO

- First, gas flow maintained at 50L/min with progressive decrease in FiO₂ of 0.05 to 0.1 every 2 hours until 30% if 88% ≤ SpO₂ ≤ 92% and/or PaO₂ ≥ 60 mmHg (8 kPa), respectively,
- Then, progressive decrease in gas flow of 5L every 2 hours until < 20L/min,
- Then, relay by standard O₂ with nasal cannula with a flow rate < 5L/min for:
  - PaO₂ ≥ 60 mmHg (8kPa),
  - PaCO₂ ≤ 45 mmHg (6kPa) (taking into account for baseline PaCO₂ in steady state)
  - pH≥ 7.35
**Procedures to withdraw from standard oxygen therapy**

Although most, if not all the patients will be discharged from the ICU/intermediate care/respiratory care unit with the need for supplemental oxygen, we suggest the following steps for potential withdrawal of oxygen:

- Progressive decrease in $O_2$ flow until 2L/min
- $O_2$ can be stopped if $88\% \leq \text{SpO}_2 \leq 92\%$ and/or $\geq 60 \text{ mmHg} \ (8 \text{ kPa})$, respectively, at a flow of $\leq 2\text{L/min}$ for a minimum of 2 hours

**Criteria to definitely stop NIV**

NIV will be stopped definitely if one of the following criteria, at least, is met:

- Intubation criteria (see Box 2)
- Clinical and gazometric (ABG) stability under oxygen therapy (HFHO or standard $O_2$) during 12 hours with :
  - $\text{PaO}_2 \geq 60 \text{ mmHg} \ (8\text{kPa})$,
  - $\text{PaCO}_2 \leq 45 \text{ mmHg} \ (6\text{kPa})$ (taking into account for baseline PaCO2 in steady state),
  - pH $\geq 7.35$.
- NIV intolerance or refuse