Non-invasive respiratory support

1. SUPPLEMENTAL, CONVENTIONAL OXYGEN SUPPLY X
   - Maintain SaO₂ ≤96%¹
   - Suggested for patients with SaO₂ <92%¹
   - Recommended for patients with SaO₂ <90%¹

2. HFNC AND CPAP/NIV
   - Generally suggested by most guidelines reviewed
   - Recommended for patients with HRF P/F= 100-300²
   - Conditionally recommended for patients
     SaO₂ ≤92% despite conventional oxygen
     at >6l/min at FiO₂ = 0,4³
   - No recommendation on preference for HFNC or CPAP/NIV or NIV via helmet or mask.

3. AWAKE PRONE POSITION
   - No clear recommendation across reviewed guidelines due to lack of evidence
   - Consider awake prone position as adjunct therapy during any form of supplemental oxygen in not intubated patients for up to 3 hours per day as tolerated.⁴
   - Consider awake prone position only if no immediate indications for invasive mechanical ventilation are present (ERS)⁴
   - Precautions: Awake prone positioning requires the maintenance of close monitoring and the presence of well-skilled health care staff.⁶

4. TIMING FOR INTUBATION
   - Still under discussion, no strong evidence available. All reviewed guidelines recommend close patient monitoring in order not to miss right point for intubation.

   Very few clear recommendations are available:
   - Consider intubation and mechanical ventilation in severe hypoxemia (P/F <150mmHg) and respiratory rate >30/min.²
   - General recommendation to intubate patients with P/F <100mmHg²

   Criteria for intubation decisions described by Pisano and colleagues:⁶
   - Need for airway protection (alteration of consciousness)
   - Severe decompensated acidosis (e.g. pH <7.2-7.25)
   - Severe absolute hypoxemia (PaO₂ <50mmHg or SaO₂ <90%-92%) despite maximal non-invasive respiratory support
   - Signs and symptoms of significant respiratory distress or tissue hypoxia despite max. non-invasive respiratory support
ROX-index for early prediction of HFNC failure:

\[
\text{ROX index} = \frac{\text{SpO}_2 / \text{FiO}_2}{ \text{Respiratory Rate}}
\]

A ROX Index >4.88 at 2, 6 or 12 hours after HFNC onset was consistently associated with a lower risk of mechanical ventilation, even after adjusting for potential confounding.

Zucman et al. tested the ROX Index in COVID-19 patients and concluded that ROX Index could help identify HFNC failures in order not to delay intubation.

**Decision Algorithm for respiratory support in COVID-19 patients suggested by Leasa and colleagues**: 

\[\text{PaO}_2/\text{FiO}_2 \geq 300 \quad 200 \quad 150 \quad < 100\]

\[\text{SpO}_2 / \text{FiO}_2 \]

\[\begin{array}{c|cccc}
\hline
\text{PaO}_2/\text{FiO}_2 & 315 & 235 & 190 & 150 \\
\text{FiO}_2 & 0.30 & 0.40 & 0.50 & 0.60 \\
\text{SpO}_2 (\%) & > 94 & 94 & 95 & < 90 \\
\hline
\end{array}\]

In our article on ventilating patients with COVID-19-associated ARDS, we reviewed relevant literature and four current guidelines to provide a practical overview. For references and details, please visit our website: [www.draeger.com/covid-ventilation](http://www.draeger.com/covid-ventilation)
Disclaimer: The information on this document is based on a series of articles that can be found on the website indicated in this document. This series of articles has been prepared in good faith based on current literature and opinions of clinical experts. It is not a summary of all available literature and therefore does not claim to be complete. The information in this article series should not be used as the basis for clinical decisions. Clinicians should consider the original references and must adhere to national/local guidelines and standards of care, as well as consider relevant literature.

REFERENCES


3. Australian guideline for clinical care of people with COVID-19, National COVID-19 Clinical Evidence Taskforce (Link). Reference in main article: 37


8. Roca O at al., An Index Combining Respiratory Rate and Oxygenation to Predict Outcome of Nasal High-Flow Therapuy, Am J Respir Crit Care Med. 2019 Jun 1;199(11):1368-1376. doi: 10.1164/rccm.201803-0589OC. Reference in main article: 46