In this issue of Flow Matters, we introduce the first published clinical protocol (algorithm, as referred to) detailing the application of NHF therapy for adult patients with AHRF.

The development and application of evidence-based protocols within the ever-evolving global healthcare landscape serve to maximize efficiency and quality of care. Robust clinical protocols are supported by the best-available evidence. These protocols can also be regarded as clinical decision trees and/or algorithms.

The authors of this publication provide a narrative review of 99 NHF studies which were located through the use of a robust search strategy. They appraise and differentiate research findings that suggest a benefit from those that do not. The included studies compare NHF to conventional oxygen devices, and/or noninvasive ventilation (NIV). The narrative review then provides the foundation for a proposed algorithm for the application of NHF for adult patients with AHRF regardless of cause.

Focus: First published clinical protocol detailing the application of nasal high flow (NHF) therapy for adult patients with acute hypoxemic respiratory failure (AHRF).

What is unique about this protocol?
• It is the first peer-reviewed, published clinical protocol for this patient population.
• This protocol is currently in active use in clinical practice.
• It was developed using robust clinical evidence (including Frat et al. 2015 and Hernández et al. 2016), which we have outlined in previous editions of this newsletter.

Why were hypercapnic patients excluded?
• The algorithm was developed to reflect its foundation trials in which, in the majority of cases, hypercapnic patients were excluded.

Who does this protocol apply to?
• Adult patients with AHRF from almost any cause, defined as PaO₂/FiO₂ ratio < 300.
• Immunocompromised patients are included.
• Hypercapnic patients defined as PaCO₂ > 45 mmHg and pH < 7.35 were excluded.

Nasal high flow therapy: a novel treatment rather than a more expensive oxygen device.

Ischaki E, Pantazopoulos I, Zakythinos S.
Eur Respir Rev. 2017

Refresher: what’s the PaO₂/FiO₂ ratio?
• It is the ratio of arterial oxygen partial pressure to the fraction of inspired oxygen.
• This may help to describe respiratory efficiency.
• For ARDS patients, a decreasing PaO₂/FiO₂ ratio may be associated with increased mortality.
• A normal ratio is > 500.

<table>
<thead>
<tr>
<th>ARDS Severity</th>
<th>PaO₂/FiO₂</th>
<th>Mortality Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>200–300</td>
<td>27%</td>
</tr>
<tr>
<td>Moderate</td>
<td>100–200</td>
<td>32%</td>
</tr>
<tr>
<td>Severe</td>
<td>&lt; 100</td>
<td>45%</td>
</tr>
</tbody>
</table>
Algorithm used under Creative Commons license 4.0

Acute hypoxaemic respiratory failure

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

<table>
<thead>
<tr>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHF initiation</td>
<td>Intubation and invasive MV</td>
</tr>
<tr>
<td>FiO2 100%, flow rate 60 L·min⁻¹</td>
<td>NHF for improving pre-oxygenation and peri-laryngoscopy oxygenation</td>
</tr>
<tr>
<td>Temperature 37°C</td>
<td>FiO2 100%, flow rate 60 L·min⁻¹</td>
</tr>
<tr>
<td>Within 1–2 h</td>
<td></td>
</tr>
</tbody>
</table>

Monitoring

Presence of one of the following: respiratory rate >35 breaths·min⁻¹,  𝑆𝑃𝑂  2 <88–90%, thoraco-abdominal asynchrony and/or persistent auxiliary muscle use, respiratory acidosis (PaCO₂ >45 mmHg with pH <7.35)

Titrations

Based on target FiO₂ (>88–90%)

<table>
<thead>
<tr>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow rate based on 25–30 breaths·min⁻¹ and patient comfort</td>
<td></td>
</tr>
<tr>
<td>Temperature based on patient comfort</td>
<td></td>
</tr>
</tbody>
</table>

Noninvasive MV

Short trial (1–2 h)

Intubation and invasive MV

NHF for improving pre-oxygenation and peri-laryngoscopy oxygenation

FiO2 100%, flow rate 60 L·min⁻¹

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

Algorithm for clinical use


Click here for more information about Ischaki et al. 2017.

Click here to contact us.

Disclaimer: Any clinical opinions in this newsletter are the opinions of the contributing authors and are given for information purposes only. The clinical opinions are not intended as and do not substitute medical advice. There are no known financial interests by any study authors in the product or manufacturer. Fisher & Paykel Healthcare provided equipment for this study. Fisher & Paykel Healthcare is not aware of any significant risks or safety concerns related specifically to this use and patient population, not discussed in this article.

F&P and Optiflow are trademarks of Fisher & Paykel Healthcare Ltd.

www.fphcare.com