

Respiratory symptoms  
COVID-19 +ve or suspected

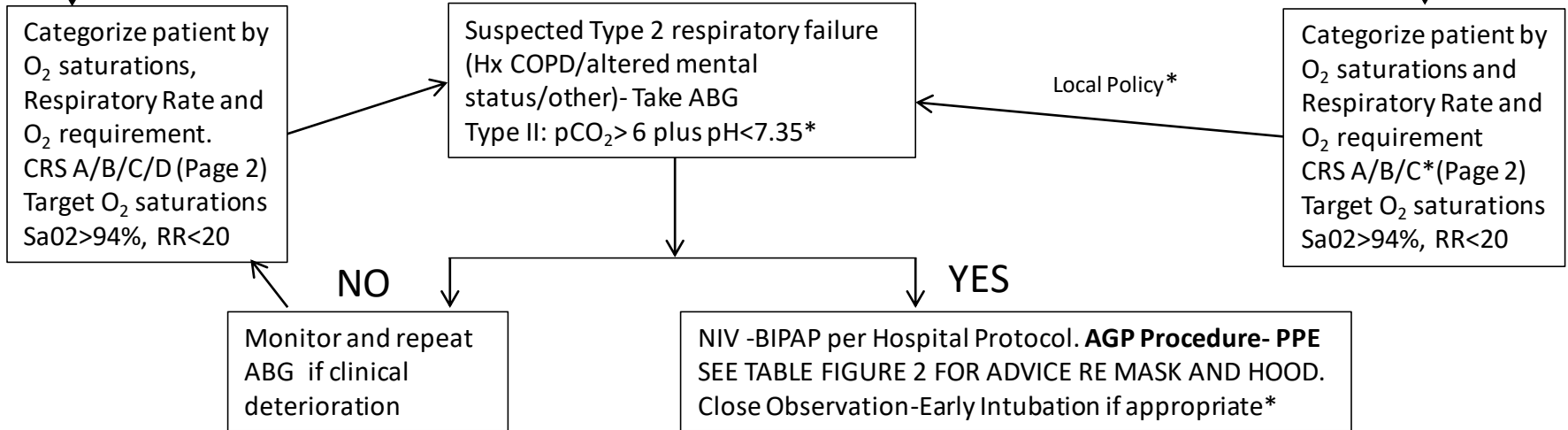
Isolate/Full PPE.  
NIV/HFNO only in -ve  
pressure (preferred) or  
single room.



For resuscitation/ ICU level  
care\*

YES

NO



**COVID RESPIRATORY SCALE (CRS) A/B/C/D\*\***

A: Nasal cannula ≤ 3L min

B: Nasal cannula > 3 L min/ Venturi Mask 24-60%

C1: High Flow Nasal O<sub>2</sub> C2: NIV

D: ICU +/- Intubate

In patients for  
intubation failing O<sub>2</sub>  
**therapy**  
(hypoxia/agitation/  
Confusion)  
**Escalate Directly to CRS**  
**D (Intubate +/- ICU)**

\*Resus status and decision for **ICU level Respiratory Care (Intubation/NIV/AIRVO)** will depend on patients advanced directive, frailty, co-morbidities and local hospital ICU protocol and availability.

\*\*Discussion between Institution Lead for Respiratory Medicine, ICU lead and Clinical Engineering re Hospital Oxygen Supply

Respiratory Management of Patients with COVID-19 V1 27.03.2020

<p><b>CRS CATEGORY A</b>  <b>NO O<sub>2</sub> REQUIREMENT/ NASAL CANNULA ≤ 3L</b>                  SaO<sub>2</sub>&gt;94%, RR&lt;20</p>	<ul style="list-style-type: none"> <li>• These patients can be managed in the first instance while stable on designated isolation general medical wards. However, single side rooms should in the first instance be reserved for patients requiring High flow oxygen (HFO) or NIV.</li> <li>• Nasal cannula up to 3 L/ min</li> </ul>
<p><b>CRS CATEGORY B</b>  <b>NASAL CANNULA &gt; 3 L min/ VENTURI 24-60%</b>                  SaO<sub>2</sub>&lt;94%, RR&gt;20 but respond well to Nasal cannula</p>	<ul style="list-style-type: none"> <li>• These patients can be managed as above BUT need an increased level of vigilance as may escalate to categories C and D <b>QUICKLY</b>.</li> <li>• Use tight fitting Venturi mask e.g. 40% RED Valve (venturi available from 24-60%)</li> <li>• Non re-breather mask (100% at 15 L/min with tight fitting mask) OPTION if no response as a bridge to Category C/D</li> <li>• See <a href="#">WHO guidance on Clinical Management of severe acute respiratory infection</a> when novel coronavirus (nCoV) infection is suspected</li> </ul>
<p><b>IF FAILURE OF CRS A/B- ESCALATE TO D IF FOR INTUBATION AND AGITATION/CONFUSION OR MULTIORGAN FAILURE. CONSIDER C1 OR C2 ON A CASE BY CASE BASIS</b></p>	
<p><b>CRS CATEGORY C1</b>  <b>HIGH FLOW NASAL O<sub>2</sub> (HFNO) (AIRVO) (**AGP)</b>                  SaO<sub>2</sub>&lt;94%, RR&gt;20: poor response to Venturi mask  <b>EVALUATE AFTER 1 HOUR. CONSIDER ESCALATION IF FAILURE (WHO)</b></p>	<ul style="list-style-type: none"> <li>• These patients need to be managed INITIALLY IF APPROPRIATE on designated COVID ISOLATION WARD with RESPIRATORY MEDICINE input in close consultation with ICU colleagues. Ensure a clearly established ceiling of care and whether patient is deemed suitable for escalation to CRS CATEGORY D – intubation and ventilation.</li> <li>• AIRVO/(HFNO)-Flow rate*** 30 L/min, FiO<sub>2</sub>&gt;70% via nasal cannula or mask. Titrate FiO<sub>2</sub> to target O<sub>2</sub> sat &gt;90%.</li> <li>• <b>VIDEO Link: <a href="#">How to set up AIRVO</a></b></li> <li>• <b>PLACE SURGICAL MASK ON PATIENT OVER HFNO.</b> Use may be influenced by National Medicinal Oxygen Availability</li> </ul>
<p><b>CRS CATEGORY C2</b>  <b>NIV (**AGP)</b>                  SaO<sub>2</sub>&lt;94%, RR&gt;20 poor response to Venturi mask  <b>HIGH RISK OF FAILURE WITH DELAYED INTUBATION, EVALUATE AFTER 1 HOUR. CONSIDER ESCALATION IF FAILURE CPAP preferred mode†</b></p>	<ul style="list-style-type: none"> <li>• NIV with CPAP and high flow oxygen – initial pressures of 8-10 cm H<sub>2</sub>O and FiO<sub>2</sub> start 70% and titrate to O<sub>2</sub> sat &gt;90% - Ventilate using HOOD if possible to minimise aerosolization. However limited availability of HOOD will necessitate use of Face mask.</li> <li>• <b>BOTH HOOD AND MASK REQUIRE 2 HEALTHCARE PROVIDERS TO PLACE PROPERLY (OR PATIENT TO HOLD MASK IF CAPABLE). VIRAL FILTERS ON EXPIRATORY PORT.</b></li> <li>• <b>NHS link of set up of NIV with well-fitting full facial mask and filter on exhalation port</b></li> <li>• <b>VIDEO Link: <a href="#">How to place HOOD</a></b></li> <li>• Titrate if needed to pressure 10-15 cm H<sub>2</sub>O and titrate FIO<sub>2</sub> to 100% -in the event you need to do this you are heading to CRS CATEGORY D–</li> <li>• NIV with Bi-level ventilation (Figure 1) is appropriate in type 2 respiratory failure as per usual practice.</li> </ul>
<p><b>CRS CATEGORY D:</b>  <b>ICU +/- INTUBATE (**AGP)</b>                  SaO<sub>2</sub>&lt;94%, RR&gt;20 but poor response to HFNO/ NIV</p>	<ul style="list-style-type: none"> <li>• Inform ICU on call IMMEDIATELY-IF patient previously deemed suitable for ventilation.</li> <li>• These patients need to go straight to ICU depending on ventilator availability and proposed ceiling of care.</li> </ul>

**Nebulizers:** Although nebulisers are not considered AGP procedure by several healthcare organizations, the use of bronchodilators through a spacer in asthma and COPD patients may have advantages including shorter duration of administration, ability to deliver through NIV Hood and patient can self-administer medication without health care provider entering room. If nebulisation absolutely required, perform in a single room where feasible. Nebulizer can be delivered through an in-line connector if using NIV Facemask ([Video Link to demonstration](#))

\*Although NHS recommends [NIV before HFNO](#), aerosol generation and success has not been compared and O<sub>2</sub> consumption varies depending on equipment and leak. Decision of which to use depends on patient factors, staff training, tolerability and equipment availability. Discussion between Institution Lead for Respiratory Medicine, ICU lead and Clinical Engineering re **Hospital Oxygen Supply and Local Respiratory Devices (e.g. NIV/HFNO) oxygen usage** recommended.

**\*\*AGP Procedures:** See [HPSC Guidance](#). There is controversy at present regarding HPSC stating HFNO is not an AGP procedure (based on data from: Leung CCH, J Hosp Infect. 2019;101(1):84-7; Hui DS, Eur Respir J. 2019;53(4); Hui DS, Chest. 2015;147(5):1336-43).

The ITS, HSE and NCP Respiratory recommend that patients on HFNO wear a tight-fitting mask and both **HFNO and chest physiotherapy** be considered AGP procedures unless local policy states otherwise.

**\*\*\*HFNO Flow Rate:** [AIRVO-Fisher & Paykel](#) recommend no less than 30L/ min (influence of flow on aerosolization potential not studied formally).

**†CPAP preferred mode:** <https://emcrit.org/pulmcrit/cpap-covid/> - Not formally evaluated- COVID-19 usually causes profound hypoxemia but normal lung compliance.

Infection Control and Prevention: [HSE PPE Guidance for Staff](#)

Further Information: [Irish Thoracic Society](#)