

Noninvasive Ventilation (NIV) Initiation Algorithm

Acute HYPERCAPNIC respiratory failure
 MUST have:
 - pH < 7.35
 - PaCO₂ > 45mmHg
 - RR > 25

Most common indications for NIV:
 COPD exacerbations
 Acute cardiogenic pulmonary edema
 OSA/OHS
 Neuromuscular disease

Criteria for intubation are present?
 - Impaired consciousness
 - Persistent shock, SBP < 90mmHg
 - Threatened airway:
 mass, stridor, aspiration

Yes
 Call RRT for Invasive mechanical ventilation
 - 6cc/kg of IBW TV

No
Initiate Bipap
 - EPAP 5 (or higher at home CPAP setting if known to have OSA/OHS)
 - IPAP 10
 - FiO₂ 50%
 - Place order in EPIC

- **Titrate EPAP** by 1-2 cmH₂O to eliminate snoring, witnessed apneas, paradoxical breathing or hypoxemia
 - **Titrate IPAP** by 1-2cmH₂O to achieve TV of 6-8cc/kg of IBW
 - **Titrate FiO₂** to maintain SpO₂ between 88-92%

1 hour
Repeat ABG

Monitor for 1 or more of:
 - RR >35
 - SpO₂ < 88%
 - Persistent use of accessory muscles or thoraco-abdominal asynchrony
 - PaCO₂ not improved by 10mmHg
 - pH < 7.25

Yes
 Call pulmonary consult for assistance managing NIV or RRT

No
 Titration every 1-2 hours until on stable settings. Check every 6-12 hours after.

In the absence of the above parameters:
 - EPAP/IPAP titration to achieve optimal synchrony and tidal volume as described above
 - FiO₂ titrated to target an SpO₂ of 88-92%.

Every 1-2 hours
Monitor for 1 or more of the signs listed

- RR >35
 - SpO₂ < 88-92%
 - Persistent use of accessory muscles
 - Thoraco-abdominal asynchrony
 - PaCO₂ worsening with pH < 7.25
 - HR > 140 or change of 20% from baseline
 - SBP < 90 or > 180mmHg or drop by 40

Yes
 Call pulmonary consult for assistance managing NIV or RRT for intubation

No
 if pH > 7.35 and pCO₂ improved to baseline wean or continue during sleep for those with OSA

High Flow Nasal Cannula (HFNC) Initiation Algorithm

Acute HYPOXEMIC respiratory failure
MUST have:
 - PaO₂/FiO₂ <300 with PaCO₂ < 45mmHg
 OR
 - SpO₂ < 88% on 6LNC or 50% Mask

Most common indications for HFNC:
 - Pneumonia
 - Pulmonary Embolism
 - Interstitial Lung Disease

Criteria for intubation are present?
 - Impaired consciousness
 - Persistent shock, SBP < 90mmHg
 - Threatened airway:
 mass, stridor, aspiration

Yes
 Call RRT for Invasive mechanical ventilation
 - 6cc/kg of IBW TV

No
Initiate HFNC
 - FiO₂ 100%
 - Flow rate 60 L/min
 - Temperature 37°C
 - Place order in EPIC

1 hour
Repeat ABG

Monitor for 1 or more of:
 - RR >35
 - SpO₂ < 88%
 - Persistent use of accessory muscles or thoraco-abdominal asynchrony
 - PaCO₂ > 45 with pH < 7.35

Yes
 Call pulmonary, Consider a trial of NIV 1-2 hours (see that algorithm) or RRT for intubation.

No
 Titration every 1-2 hours until on stable settings. Check every 6-12 hours after.

In the absence of the above parameters:
 - Flow rate should be targeted to patient comfort and to maintain RR < 25-30.
 - FiO₂ titrated to target an SpO₂ of 88-92%.

Every 1-2 hours
Monitor for 1 or more of the signs listed

- RR >35
 - SpO₂ < 88-92%
 - Persistent use of accessory muscles
 - Thoraco-abdominal asynchrony
 - PaCO₂ > 45 with pH < 7.35
 - HR > 140 or change of 20% from baseline
 - SBP < 90 or > 180mmHg or drop by 40

Yes
 Call pulmonary, Consider a trial of NIV 1-2 hours (see that algorithm) or RRT for intubation.

No
 Wean from HFNC per protocol

Weaning, changes made every 1-2 hours to target SpO₂ of 88-92% and RR <25-30:
 - First decrease FiO₂ by 0.1
 - When FiO₂ <0.4, decrease flow rate by 5 L/min
 - When flow rate <15 L/min, can stop HFNC
 - Transition to standard oxygen at 6-8L/min