



Corporate Standard Operating Procedure

NIV with helmet assembly

Purpose Statement: To provide guidance for the set-up and use of the CaStar NIV Helmet for the purposes of providing Non-Invasive Ventilation (NIV) via dual limb ventilators. (PB980, Evita XL)

Scope: Registered respiratory therapist (RRT), Graduate Respiratory therapist (GRT) and Student respiratory therapist.

Alerts:

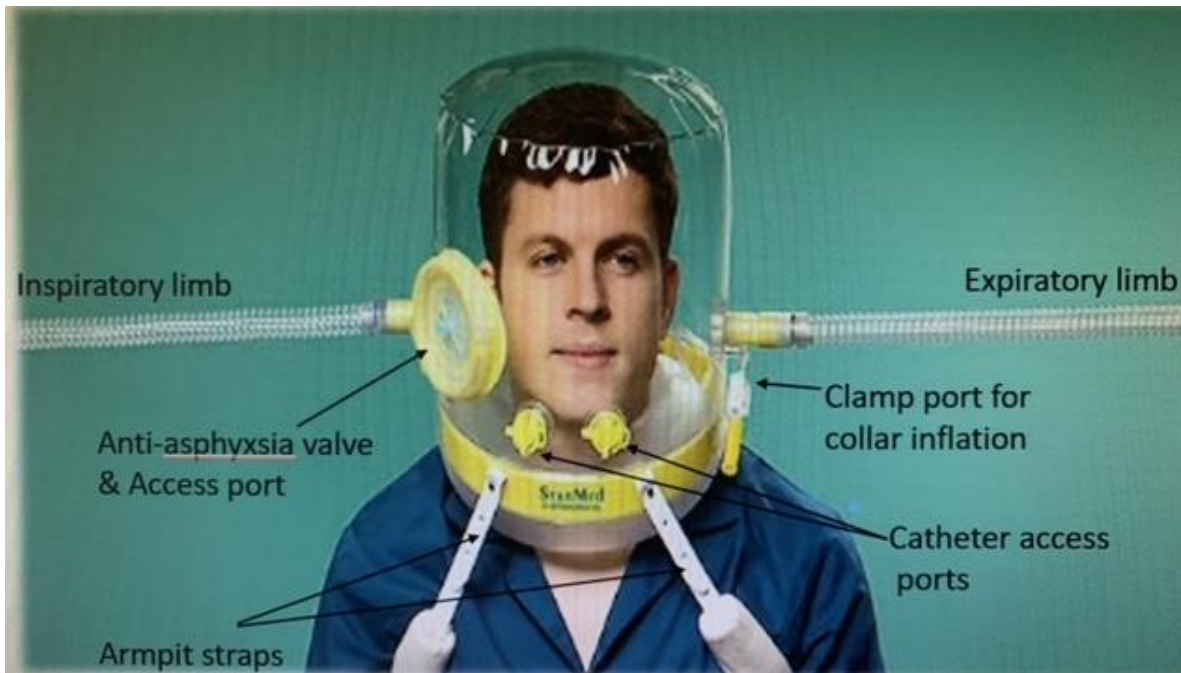
- The NIV with hood assembly will be ordered by intensivist or fellows only.
- Single patient use
- This is a high-risk procedure that generates droplets, exposing staff to respiratory pathogens. Appropriate Personal Protective Equipment (PPE) must be applied.
- Anti-asphyxiation valve opens if pressure in the circuit drops below 2 cmH₂O.
- Do not use on broken skin
- At higher pressures, patients may need to pressure equalize their ears by swallowing, yawning, etc., or can use ear plugs if having continued discomfort
- Consider NG insertion for NPPV lasting longer > 2 hours.
- Patients supported with NIV and hood assembly should be NPO and the intake of oral medication should be restricted. Only sips of water for essential medication under the direct supervision of an RN or RT should be allowed.
- Displayed volumes are inaccurate. Volume is lost to helmet expansion therefore don't reflect true patient values.
- Minimum Peep of 5cmH₂O

Definitions:

NIPPV (Non-Invasive Positive Pressure Ventilation): Technique employed to augment spontaneous ventilation without the use of an artificial airway. It may be delivered with a variety of interfaces.

Equipment:

1. NIV upgraded ventilator
2. Appropriately sized hood
3. White filter optional to possibly reduce noise (SPD# 337410)
4. Bulb/cuff inflator with connectors for inflation of cushion (see appendix B)



Neck Circumference	Helmet Size
27-34cm	Small
34-41cm	Medium
40-47cm	Large
45-52cm	X-Large

Procedure:

1. Remove device from package and reshape to restore its cylindrical shape.
2. Secure the fastening straps on the rear of the helmet.
3. Remove access port and verify anti-asphyxia valve by pulling on it.
4. Connect breathing circuit to the inlet and outlet connectors.
5. Activate vent in NIV mode with appropriate settings.
6. Set sensitivity as low as possible without causing auto-triggering.
7. Open the collar using 4 hands in such a way that the patient's head can pass through.
8. Complete securing of fastening straps on front of helmet. Adjust length of straps so that the rigid ring is about 1cm from the patient's shoulders.
9. Thread through any feeding tubes or lines through the catheter access ports as needed, then cap.
10. Secure large access port, manually pulling the anti-asphyxia valve to pressurize, if needed.
11. To increase comfort, the inner cushion/cuff can be inflated, then clamped. A bulb with connectors (see picture) can be used to inflate. Do not leave the bulb at bedside but do keep connectors for same-patient use.
12. Heated humidity is not recommended due to rainout.

Removing

1. Alternate oxygen equipment set up ready.
2. Deflate inner cushion/cuff by opening clamp. Pressure within the helmet will deflate it automatically.
3. Open large access port. Remove any tubes/lines from the catheter access ports.
4. Detach fastening straps.
5. Remove helmet by opening collar using 4 hands.
6. Turn off ventilation flow.

Documentation:

- 1) NIV parameters and alarm settings to be verified and charted Q2H-Q3H

Process Flow: NA

Related Policies:

1. Corporate Nursing Standard Operating Procedure: Non-invasive Positive Pressure Ventilation (NPPV) : Monitoring and Care.
2. Respiratory therapy : Rescue Bilevel
3. Corporate SOP: Aerosol Generating Respiratory Procedures
4. Covid-19 Protocol

<https://tohpps.policymedical.net/policymed/newSearch/searchDocuments?sfContent=AGMP&queryStr=%2Fpolicymed%2FnewSearch%2FdoSearchReg%3FsfContent%3DAGMP#>

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Related Procedures:

List all related procedures.

If there are no related procedures, state "None"

Related Tools/Forms etc.:

<https://www.youtube.com/watch?v=kWPIB92K22I>

References:

Clinical Practice Guideline for the use of CaStar Helmet for Non-Invasive Ventilation in the ICU, Covenant Health, Alberta, Canada.

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Sinuff T, Cook D, Randall J, Allen C: Evaluation of a practice guideline for non-invasive positive pressure ventilation for acute respiratory failure. *Chest* 2003; 123:2062-2073.

Liesching T, Kwok H, Hill N: Acute applications of non-invasive positive pressure ventilation. *Chest* 2003; 124:699-713.

British Thoracic Society Standards of Care Committee: Non-invasive ventilation in acute respiratory failure. *Thorax* 2002; 57:192-211.

Fodil R, Lellouche F, Mancebo J: Comparison of patient-ventilator interfaces based on their computerized effective dead space. *Intensive Care Med* 2011; 37(6):257-262.

Vargas F, Thille A, Brochard L: Helmet with specific settings versus facemask for noninvasive ventilation. *Crit Care Med* 2009; 37(6):1921-1928.

Ozlam C, Ali A: Comparison of helmet and facial mask during noninvasive ventilation in patients with acute exacerbation of chronic obstructive pulmonary disease: a randomized controlled study. *Turk J Med Sci* 2015; 45(3):600-606.

Appendix A

INDICATION

1. NIV patients not tolerating standard face mask interface
2. patients anticipated to have extended length of NIV use
3. patients with existing or impending pressure injuries from face mask interface(s)

CONTRAINDICATION - ABSOLUTE

- 1) Facial burns/trauma or post facial surgery
- 2) Upper GI bleed or recent GI surgery
- 3) Inability to protect the airway
- 4) Fixed upper airway obstruction
- 5) Bowel obstruction
- 6) Epistaxis
- 7) Untreated pneumothorax
- 8) Active nausea and vomiting
- 9) Cardiac or respiratory arrest
- 10) Uncontrolled dysrhythmias causing hemodynamic instability
- 11) Hemodynamic instability
- 13) Use of wrist restraints

RELATIVE CONTRAINDICATION

- 1) Diaphragmatic hernia
- 2) Acute myocardial infarction
- 3) Impaired level of consciousness (GCS \leq 8)
- 4) Copious secretions
- 5) Bullous emphysema
- 6) Suspected bowel obstruction
- 7) Patient is NPO for < 1hour prior to initiation
- 8) Treated pneumothorax
- 9) Patient under airborne precautions IN a negative pressure room

Appendix B:



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Metadata for Policy Medical Only – will not appear on the document

Document #: <<*i.e.: COR-ADM-100*>>

Created: <*date initially developed*>

Description:

Published on:

Responsible Department:

Last Review date:

Version:

Effective date:

Summary of Changes:

Audience:

Next Review Date

Author:

Owner/Manager:

Approver:

Committee:

Key Stakeholders/Reviewers for workflow: