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| **Huron Perth Healthcare Alliance** |
| **1. Clinical Policies and Procedures** | Original Issue Date:  | June 13, 2019 |
| **Mechanical Ventilation with the Monnal T60**  | Review/Effective Date:  | June 13, 2019 |
| **Approved By: VP People and Chief Quality Executive** | Next Review Date:  | June 13, 2021 |

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| https://intranet.hpha.ca/myalliance/imgs/spacer.gif |
| This is a CONTROLLED document for internal use only.Any documents appearing in paper form are not controlled and should be checked against the document (titled as above) on the file server prior to use.  |
| **Scope:**This policy applies to Registered Nurses (RN) employed in the Emergency Departments of the St Marys Memorial Hospital (SMMH), Seaforth Community Hospital (SCH) and Clinton Public Hospital (CPH) who have received appropriate theoretical preparation and who have met the competency requirements listed in this policy to care for adult and pediatric patients requiring invasive and non-invasive positive pressure ventilation via the Monnal T60 ventilator. **Policy:**This policy describes the care of adult and pediatric patients requiring invasive and non-invasive positive pressure ventilation via the Monnal T60 ventilator. **Purpose:**This policy, in addition to the associated eTRAIN module: “Monnal Travel Ventilator” and Elsevier skill modules listed below, acts as a guideline for Registered Nurses to apply best practices in the provision of care for all patients receiving short term invasive or non-invasive mechanical ventilation support.Prior to initiating any of the interventions outlined in this policy, nurses must have the knowledge, skill and ability to identify associated risks and precautions, manage potential adverse outcomes and provide ongoing assessment and monitoring of the patient requiring invasive or non-invasive positive pressure ventilation via the Monnal T60. It is expected that nursing staff shall adhere to the principles outlined in this policy, the [Monnal T60 ventilator manufacturers recommendations](https://www.airliquidehealthcare.ca/monnal-t60-user-manual), as well as the associated Elsevier modules:* eTRAIN: Monnal Travel Ventilator
* [Elsevier- Mechanical Ventilation: Pressure Support, Pressure Control, and Volume-Assured Pressure Support (Respiratory Therapy)](https://login.elsevierperformancemanager.com/systemLogin.aspx?virtualname=HPHA&hhc_url=https%3a%2f%2flms.elsevierperformancemanager.com%2fContentArea%2fNursingSkills%2fGetNursingSkillsDetails%3fskillkeyid%3d10880%26skillid%3dRC_015B)
* [Elsevier- Mechanical Ventilation: Pressure-Regulated Volume Control Ventilation (Respiratory Therapy)](http://mns.elsevierperformancemanager.com/SkillsConnect/Default.aspx?Token=1046880&SkillID=10923)
* [Elsevier- Suctioning: Artificial Airway During Mechanical Ventilation (Respiratory Therapy)](http://mns.elsevierperformancemanager.com/SkillsConnect/Default.aspx?Token=1046880&SkillID=10867)
* [Elsevier- Mechanical Ventilation: Troubleshooting (Respiratory Therapy) Elsevier](http://mns.elsevierperformancemanager.com/SkillsConnect/Default.aspx?Token=1046880&SkillID=10943)

**Definitions:****Invasive Mechanical Ventilation: (AVCV- Assist Volume Control Ventilation)**Involves ventilating the lungs with positive pressure through an endotracheal tube or tracheostomy tube in order to provide temporary support to assist with a patient’s ventilation and oxygenation requirements. **Non-Invasive Positive Pressure Ventilation (NIPPV – 100% 02 NIV)**Refers to the non-invasive delivery of positive pressure through an interface (facemask) to the upper airways without the use of an invasive airway (endotracheal tube (ETT) or tracheostomy tube). **Indications:**Mechanical ventilation is indicated when circumstances exist that threaten the life of the patient. The Monnal T60 ventilator will be used to provide ventilator support to patients meeting the criteria of acute respiratory insufficiency/failure and/or have an endotracheal tube already in place. AVCV clinical indications include but are not limited to:* Apnea
* Exacerbation of chronic obstructive pulmonary disease
* Acute severe asthma
* Acute respiratory insufficiency complicating neuromuscular disorders (i.e.; Guillain-Barre, Myasthenia gravis)
* Heart failure and cardiogenic shock
* Acute brain injury

 NIPPV clinical indications include but are not limited to:· Dyspnea* Accessory muscle use
* Sp02 less than 88%
* Respiration rate greater than 24 breaths/min
* Disease states of:
	+ Acute exacerbation of COPD
	+ Acute Pulmonary edema
	+ Acute CHF

 **Contraindications:** Contraindications to AVCV include:* When intubation and mechanical ventilation are contrary to the patient’s expressed wishes.

Contraindications to NIPPV may include but are not limited to:* Patients with an altered level of consciousness.
* Patients unable to maintain a patent airway.
* Patients unable to clear secretions adequately.
* Patients with epistaxis, sinusitis or otitis media.
* Patients at risk of vomiting and aspiration.

 **Competency Requirements:**Nurses employed at the HPHA will have been considered to have received the appropriate theoretical preparation to care for and manage patients requiring mechanical ventilation via the Monnal T60 upon successful completion of the following:* Complete the following education: **eTRAIN “Monnal Travel Ventilator”**

 **Travel Ventilator Modules 1,2 and 3** and obtain a passing grade of at least 85%; * Review the **HPHA Policy: Mechanical Ventilation with the Monnal T60 (SMMH, SCH, CPH Emergency Departments)**;
* Review the **HPHA Emergency Department Order Set for Ventilated Patients**;
* Self-assess their knowledge and proficiency on an annual basis in managing patients receiving support via the Monnal T60, take appropriate measure to ensure competency is maintained and retain a record of related learning activities, as per CNO practice standards.

 **Considerations:*** Ventilator and bedside alarms must be on at all times; patients are never to be left unattended while on the Monnal T60.
* For all audible ventilator alarms, the nearest available RN or Physician will respond immediately to the patient’s bedside and assess for respiratory distress or a disconnection.
* Suction equipment, oxygen, and bag-valve-mask (BVM) must be readily available at the bedside of all patients on the Monnal T60.
* Patients on the ventilator will be on a continuous cardiac monitor and pulse oximetry with vital signs recorded a minimum of every 10 minutes until stable, then every hour and with any change of settings or as frequently as their condition dictates.
* The Monnal T60 will be utilized in the Emergency Department for short term support only. Consider consult and/or transfer as soon as possible.
* If greater than 60% oxygen is required and desired saturation levels cannot be obtained via NIPPV, consideration should be given for intubation and invasive ventilation.

 **Procedure:**The [*Your Quick User Guide To The Monnal T60 Travel Ventilator*](https://www.airliquidehealthcare.ca/monnal-t60-user-manual)shall be used for the procedure on the initiation, management and discontinuation of a patient from the Monnal T60. Refer to the [**Monnal T60 Manufacturer’s instructions**](https://www.airliquidehealthcare.ca/monnal-t60-user-manual) for additional information.Upon insertion and confirmation of placement of the artificial airway, the physician will prescribe orders for Mechanical Ventilation and/or will complete the **HPHA Emergency Department Order Set for Ventilated Patients**.The Registered Nurse will initiate mechanical ventilation via the Monnal T60 and may adjust settings as prescribed when ordered by the physician. **Registered Nurse Responsibilities:*** For invasive ventilation, assist the physician to secure the position of the endotracheal tube with the securement device.
* For NIPPV, determine appropriate mask size prior to initiating therapy.
* Set up the mechanical ventilator, accessories and tubing.
* Adjust ventilator settings according to physician orders and/or the HPHA Emergency Department Order Set for Ventilated Patients.
* Set up in-line suction for patients with an endotracheal tube.
* Suction as required both orally and/or via the endotracheal tube.
* Monitor and document the assessment of patient status after any ventilator setting changes and troubleshooting of ventilator.
* Observe for hemodynamic changes associated with increased VT (Tidal Volume), PEEP (Positive End Expiratory Pressure) or decreased cardiac output.
* Assess necessity for physical restraints to prevent accidental removal of the endotracheal tube or NIPPV mask.
	+ If restraints are required, obtain physician order for soft restraint application.
* Administer pharmacologic agents as ordered to optimize patient comfort.
* Immediately respond to and assess all alarms and take appropriate action.

 If unable to determine the reason for an alarm sounding, disconnect the ETT (endotracheal tube or tracheostomy tube). or mask from the ventilator and manually ventilate the patient with a bag valve mask delivering 100% O2 and notify physician immediately.* Inform the physician of any problems with the patient’s tolerance to the ordered ventilator settings, vital signs, or any change in their condition.
* As appropriate, reassure and remind patient frequently about intubation or mask and ventilation.
* Reassure family and provide education as needed.

**Inter-Facility Transport of Patients Receiving Mechanical Ventilation** * Patients will receive care and monitoring during transport.
* Transport to another department (Medical Imaging) and/or facility of a patient on the Monnal T60 will occur with a Physician and a Registered Nurse.
* When transporting the patient, plug the ventilator into an electrical outlet when available.
* All supplies that would be required for intubation, including a bag-valve-mask (BVM), must accompany the patient during transport.

 **Cleaning, maintenance and storage after each patient:*** Remove and discard the used ventilator circuit.
* Remove and dispose of used flow sensor and exhalation valve.
* Wipe the ventilator with approved disinfectant wipes and follow product information.
* Re-circuit and keep ventilator plugged in for battery to maintain charge.
* Complete the Monnal T60 *Checkout* procedure and sign off that unit is ready for use (see [*Your Quick User Guide To The Monnal T60 Travel Ventilator*](https://www.airliquidehealthcare.ca/monnal-t60-user-manual)*)*
* Auto test will be performed with nightly duties by the emergency department RN. Ensure additional supplies are readily available in the emergency department.
* Materials Management will maintain stock levels of the Vent consumables in the emergency departments of SMMH, SCH, CPH. Biomed will perform all repairs and preventative maintenance on the Monnal T60 Travel Ventilator. To request service, enter a ticket through HPHA Service Anywhere.

**Related Resources:**  * [*Your Quick User Guide To The Monnal T60 Travel Ventilator*](https://www.airliquidehealthcare.ca/monnal-t60-user-manual)
* [Monnal T60 devicemanufacturer instructions](https://www.airliquidehealthcare.ca/monnal-t60-user-manual)
* [HPHA Least Restraints Policy](https://intranet.hpha.ca/myalliance/Default.aspx?cid=12949&lang=1)
* [HPHA End Tidal CO2 Monitoring policy](https://intranet.hpha.ca/myalliance/Default.aspx?cid=9034&lang=1)

 **Documentation:*** Documentation of all aspects of care provided will be completed on transfer using the Clinical Notes record (Form # GE0016M2). In the Emergency Department, ventilator-specific documentation is to be completed in EDM, which can be found in assessments under the mneumonic TRAV-AVCV (Assist Vol Control Ventilation) or TRAV-NIPPV (Non Invasive Posit Press Vent)as appropriate.

 Nursing documentation of a patient receiving mechanical ventilation should include but is not limited to:* Respiratory assessment to include: chest auscultation, work of breathing and patient’s comfort with the ventilator.
* Tolerance to ventilator support.
* Type and size of endotracheal or tracheostomy tube.
* Size of NIPPV mask.
* Location and depth of tube (if endotracheal tube, measured in centimeters at the lips).
* Initial ventilator settings, alarms and any change in orders according to patient’s condition.
* Amount, consistency and color of tracheal secretions after each suction session.
* Restraint application and monitoring in EDM if applicable.
* Unexpected outcomes and additional nursing interventions.
* Patient/family education

 **References:**Air Liquide Healthcare. (2016). Monnal T60 Touch and Breathe. Retrieved on December 4th, 2018 from <https://www.device.airliquidehealthcare.com/sites/alms/files/2016/12/16/news_8_pages_t60-gb.pdf> CentraCare Health (CCH). (2015). Standards of Care: Mechanical Ventilation. Retrieved on November 27th, 2018 from <https://www.mnhospitals.org/Portals/0/Documents/patientsafety/VAE/StCloud_MechVentStandardsofCare.pdf> Grey Bruce Health Services. (2017). GBS Rural Sites Non Invasive (Bi-PAP) and Invasive Ventilation –Management of Acute Respiratory Insufficiency/Failure. Ken Thorup. (2018). Cardiorespiratory Services-Noninvasive Positive Pressure Ventilation (NIPPV/NIV) [Powerpoint presentation]. Pierson, D.J. (2018). University of Washington: A primer on Mechanical Ventilation. Retrieved November 27th, 2018 from <https://courses.washington.edu/med610/mechanicalventilation/mv_primer.html#indications> Saskatoon Health Region. (2017). Ventilation-Acute Care of Mechanically Ventilated Patient- Adult. Retrieved on Dec 4th 2018 from <https://www.saskatoonhealthregion.ca/about/NursingManual/1138.pdf> |