HEALTH HOLDING

HAFER ALBATIN HEALTH CLUSTER
MATERNITY AND CHILDREN HOSPITAL

Department:	Respiratory Care Services		
Document:	Departmental Policy and Procedure		
Title:	High Flow Nasal Cannula Therapy		
Applies To:	Respiratory Therapy Staff		
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1. PURPOSE:

1.1 To explain the function, set-up, management, and weaning of the High Flow Nasal Cannula Therapy systems

2. DEFINITONS:

2.1 **High Flow Nasal Cannula Therapy (HFNC)** — provides a heated and humidified flow of gas to a patient at a specified pre-set Fi02 via nasal cannula. The oxygen flow through this therapy ranges from 1 to 60 liters per minute (Umin), dependent on the specific device and interface. The integrity of the precise FiOz is assured via an integral oxygen analyzer dependent on the device.

3. POLICY:

3.1 HFNC therapy can be provided in clinical areas where close patient monitoring is continuously a' ailablei.e. the following intensive care units (ICUs): neonatal intensive care unit, pediatric intensive care unit, adult intensive care unit, and Emergency Department (ED).

3.2 Frequency of assessing patients while on HFNC devices will be performed as per the frequency of patient system assessments.

3.3 The RCP is responsible for:

3.3.1 Setting up the HFNC therapy, making adjustments, and monitoring the patient.

3.3.2 Placing a non-rebreather mask at the bedside of any patient on 50% oxygen or greater on an HFNC device.

3.3.3 Placing an alternative oxygen source with appropriate equipment at the bedside of all patients on HFNC devices, to allow the immediate provision of oxygen delivery in case the HFNC needs to be taken off the patient.

3.4 The HFNC device should not be turned on and left unattended if not on a patient.

3.5 HFNC devices should nol be used during Magnetic Resonance Imaging (MRI).

3.6 A complete physician order for using HFNC therapy must be issued before the initiation of the HFNC therapy.

3.6.1 Consult the ordering physician before putting the cyanotic congenital heart disease patients on HFNC therapy, as disease-specifc SpOz may need to be targeted.

3.6.2 Use caution when setting the FiOz on patients with single ventricle physiology undergoing palliation, or patients adversely affected by oxygen-mediated decreases in Pulmonary Hypertension.

3.7 The HFNC device should not be used during the transport of the patient.

3.8 Indications:

3.8.1 Primary: Humidification i.e. adding warm moisture to breathing gases from an external source for administration to a neonate/infant, pediatric and adult patients.

3.8.2 Secondary: Patients who exhibit respiratory distress or are experiencing the following conditions may beneft from HFNC therapy:

3.8.2.1 Acute Respiratory Distress Syndrome (ARDS)

3.8.2.2 Viral bronchiolitis
3.8.2.3 Pneumonia
3.8.2.4 Severe Acute Asthma
3.8.2.5 Congenital Heart Defects (CHO)
3.8.2.6 Persistent Pulmonary Hypertension
3.8.2.7 Broncho Pulmonary Dysplasia (BPD)
3.8.2.8 Separation from mechanical ventilation
3.8.2.9 Separation from non-invasive ventilation

3.8.3 Signs and Symptoms of a patient who might benefit from HFNC therapy use include:
3.8.3.4 Mild to moderate respiratory distress
3.8.3.2 Hypoxemia
3.8.3.3 Hypercapnia
3.8.3.4 Tachypnea
3.8.3.5 Accessory muscle use
3.8.3.6 Grunting
3.8.3.7 Nasal flaring
3.8.3.8 Mild apnea and bradycardia (neonates)

3.9 Contraindications (General):
3.9.1 Any situations in which humidification is contra-indicated
3.9.10 Specific to the cannula portion of HFNC therapy device: Patients with occluded or defective nares should not use the system.

3.10 Hazards/complications:
3.10.1 Do not use HFNC devices in or around water other than the water bag that feeds the system.
3.10.2 HFNC units do not provide Continuous Positive Airway Pressure (CPAP).
3.10.3 Never connect the unit to a patient until it reaches the set temperature level (i.e. the temperature display stops dashing).
3.10.4 Allow the unit to warm up to purge condensate and prevent patient discomfort due to cold or partly humidified gas.

4. PROCEDURE:

4.1 Verify physician's order/request for correctness and completeness.
4.1.1 Total liter flow of gas to be set.
4.1.2 Desired oxygen saturation
4.1.3 Follow w physician's order for weaning the patient from HFNC Therapy or you may use Appendix D or E as a guide if the physician agrees.

4.2 Gather necessary equipment and supplies.
4.2.1 Refer to Appendix A for the Vapotherm System
4.2.2 Refer to Appendix B for the AIRVO 2 System
4.2.3 Refer to Appendix C for VN500

4.3 Ensure the presence and continued relevance of the current care plan.

4.4 Follow relevant infection control activities (e,g. hand washing, glove, gown, mask, etc.) so avoid touching connection points when handling HFNC devices.

4.5 Confrm patient idenlily per hospital policy

4.6 Explain the purpose and goals of intended activities to the patient; patient U-family education as required.

4.7 Assemble necessary equipment and supplies, ensuring proper operation.
4.7.1 Refer to Appendix A for the Vapotherm System
4.7.2 Refer to Appendix B for the AIRVO 2 System
4.7.3 Refer to Appendix C for the Babylog VN500 System.

4.8 Connect the HFNC device to the patient:

4.9 Make pertinent observations and measurements, such as:
4.9.1 Level of work of breathing

4.9.2 Oxygen saturation by pulse oximetry (Sp02)
4.9.3 Carbon dioxide level (PCO2)
4.9.4 Fraction of inspired oxygen (Fi0)
4.9.5 Nasopharynx patency
4.9.6 Feeding tolerance

4.10 Assess the impact of care/treatment in achieving desired outcomes.

4.11 Record observations and assessments as required and appropriate
4.11.1 Record observations and assessments as required and appropriate.
4.11.2 Flow rate, Fi0z, device temperature, water level.
4.11.3 Patient's response or any other pertinent actions or observations.

4.12 Ensure appropriate communication with other health care workers, if indicated.

4.13 Clean, store, and discard any consumables and/or equipment as appropriate.
4.13.1 The AIRVO 2 unit MUST be cleaned and receive high-level disinfection, per the AIRVO 2 Disinfection Kit Manual.
4.13.2 The AIRVO 2 air filter at the rear of the unit should be replaced if a highly infected patient has used the unit.

5. MATERIALS AND EQUIPMENT:

5.1 N/A

6. RESPONSIBILITIES:

6.1 Respiratory Therapist

7. APPENDICES:

7.1 Babylog VN500
7.2 Vapotherm Neonatal Implementation and Maintenance Guidelines
7.3 Vapotherm Neonatal Weaning Guidelines
7.4 Vapotherm Pediatric Implementation and Maintenance Guidelines
7.5 Vapotherm Pediatric Weaning Guidelines
7.6 AIRVO 2

8. REFERENCES:

8.1 AIRVO 2 Operators Manual
8.2 AIRVO 2 Disinfection Kit Manual
8.3 Babylog VN500 Operator's Manual.
8.4 King Abdullah bin Abdulaziz University Hospital, February 2017

9. APPROVALS:

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Appendix 7.1 Babylog VN500

1. Intended Use:

1.1 During 02 therapy with the Babylog VN500, nasal cannulas can be used.

2. Required Equipment and Supplies

2.1 Babylog VN500 device

2.2 Ventilator circuit

2.3 Sterile water bag

2.3.1 Appropriate size RAM Cannula

2.3.1.1 The ideal prong size will fill approximately 80% of the nares. Ensure that prongs do not fll nares completely

3. Caution:

3.1 Internal monitoring is deactivated. Airway pressure and ventilation parameters (e.g., flow, minute volume, or apnea are not monitored).

4. Assembling Equipment and Supplies:

4.1 Fit the breathing hoses for inspiration, The expiratory ports on the device and on the Y-piece remain open.

4.2 Switch on Babylog VN500

4.3 Switch Babylog VN500 to standby.

4.4 Activate 02 monitoring.

4.4.1 The alarm limits for MVe, RR, Paw, Tapn are not active. The alarm limits for 02 moniloring is automatically set by the device.

4.5 Connect the RAM cannula for 02 therapy to the Y-piece

4.5.1 Touch the "start" button and confirm with the rotary knob.

4.5.2 Touch the "start" button and confirm with the rotary knob.

4.5.3 Touch the "start" button and confirm with the rotary knob.

4.5.4 Set the corresponding therapy control for Fi02 and Flow.

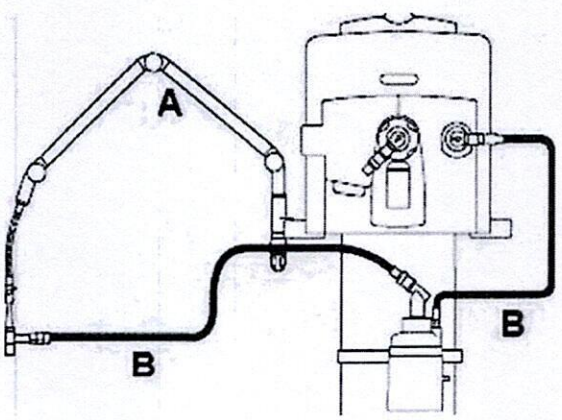
4.5.4.1 Fi02 can be set from 21 % to 100%

4.5.4.2 Flow can be set (rom 2 to 50 Umin.

4.5.4.2.1 Set the value by turning the rotary knob and push to confirm

4.5.4.3 The 02 and flow can also be set in the "ventilation setting" dialog window

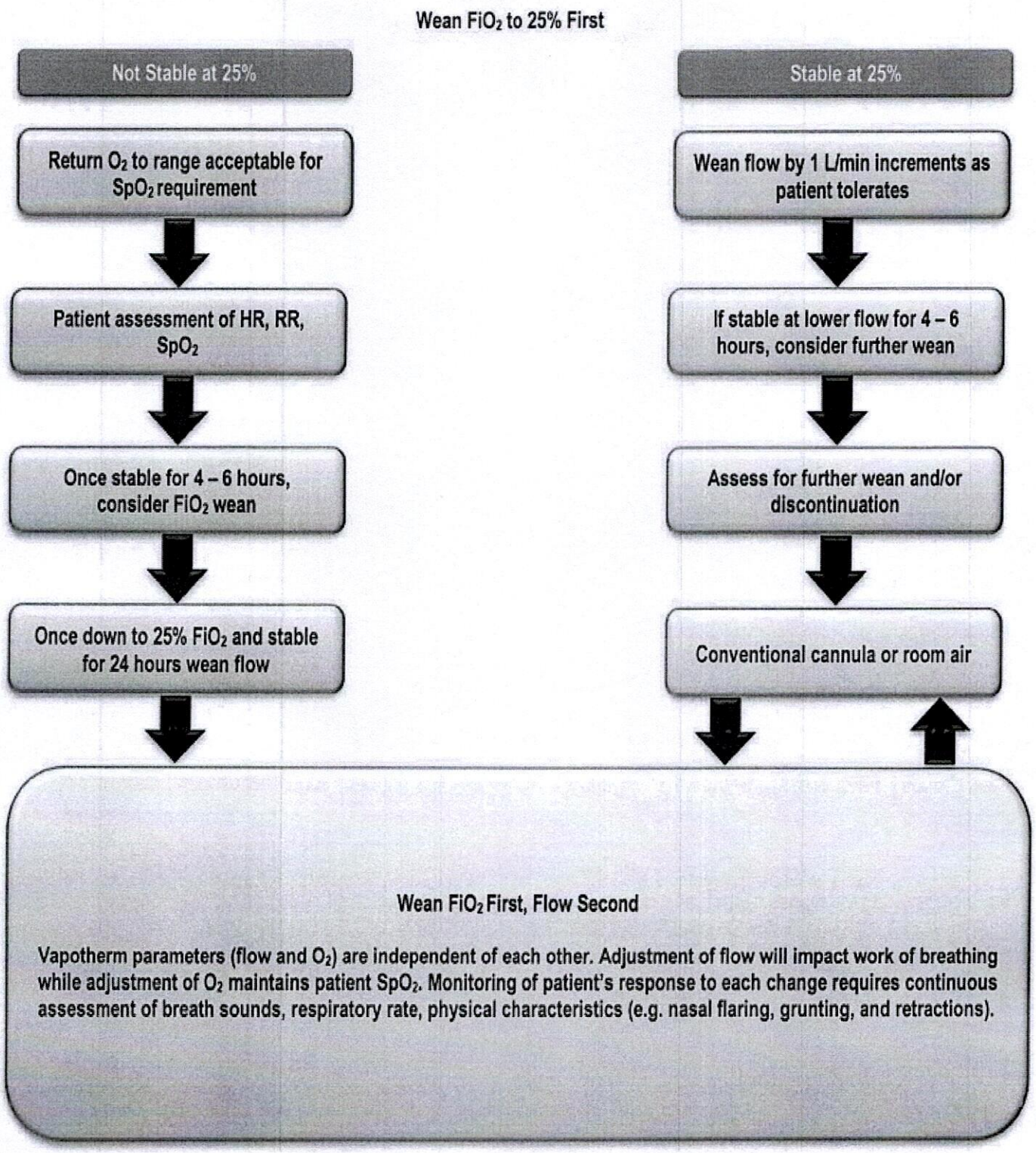
4.5.4.3.1 Touch lhe button "ventilation settings" Place the nasal cannula on the patient.



Appendix 7.2 Vapotherm Neonatal Implementation and I\Maintenance Guidelines

Patient Assessment	Flow	Temperature	Fi0z
Sp0z greater than 88% with a moderate increase in work of breathing.	Start at 4 L/min and increase by 0.5 L/min as work of breathing requires.	36°C - 37°C	Start at 21% and increase conservatively to maintain the target SPOT
SpOz is lower than 88% with a moderate increase in work of breathing.	Start at 5 L/min and increase by 0.5 L/min as work of breathing requifes.	36°C - 37°C	Start at 25% and increase conservatively to maintain the target SPOT
SpO2 is less than 88% with severe respiratory distress.	Start at 6 Umin and increase by 0.5 L/min as work of breathing requires.	36°C - 37°C	Start at 30% and increase consefvatively to maintain Ihe target SPOT

Appendix 7.3 Vapotherm Neonatal Weaning Guidelines

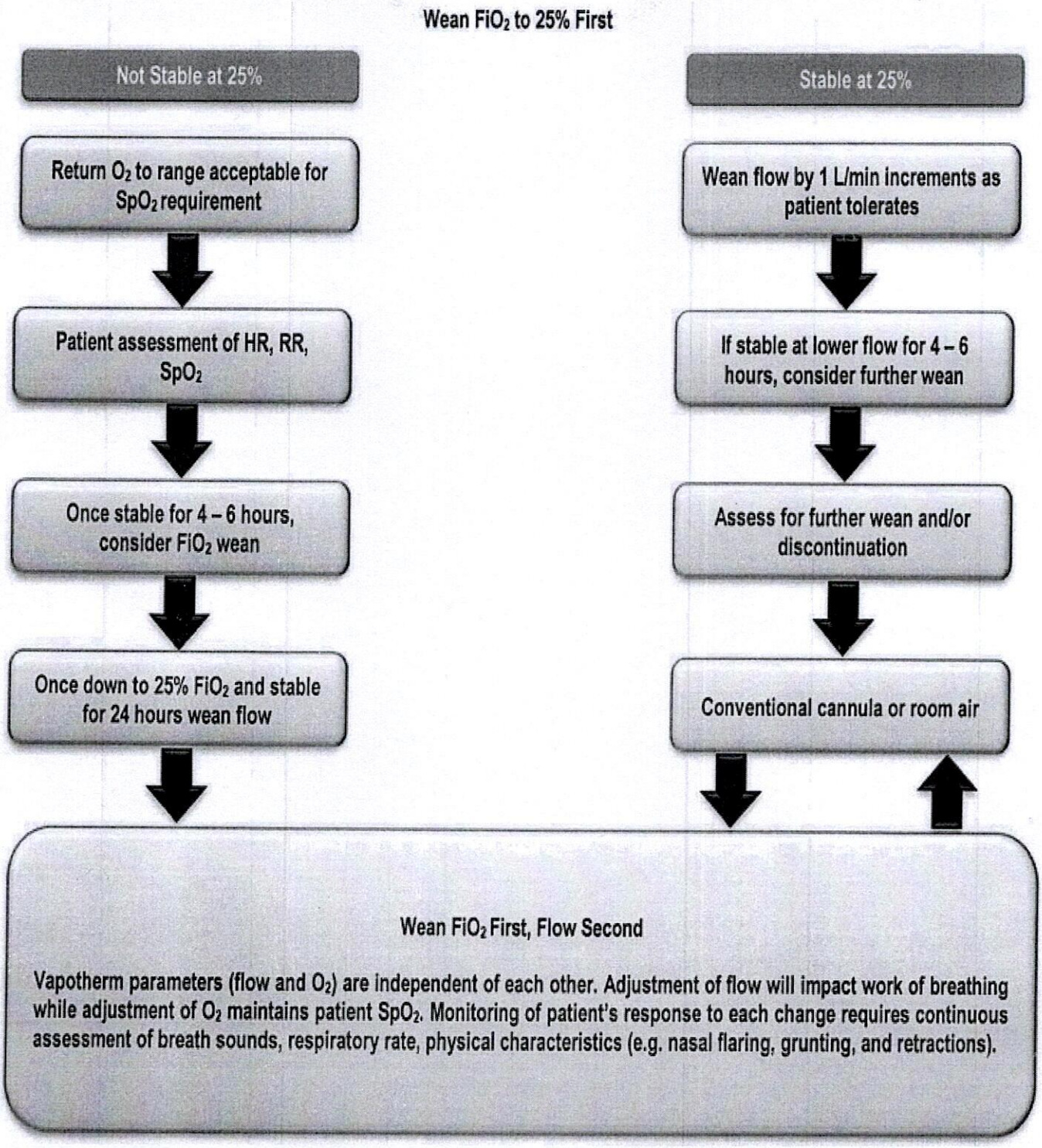


Appendix 7.4

Vapotherm Pediatric Implementation and Maintenance Guidelines

<table>
<tr><td colspan="4">Patient Assessment: SpO less than 92% and/or increased work of breathing.</td></tr>
<tr><td>AGE</td><td>FLOW</td><td>TEMPERATURE</td><td>FI0</td></tr>
<tr><td>0 — 30 days</td><td>Start at 5 — 8 Umin and increase by 1 L/min as work of breathing requires.</td><td rowspan="5">Set temperature at 37°C and adjust to patient preference</td><td>Start at 0.40 and bitrate as needed to achieve tafget SPOT.
"if SPOT is greater than 92%, start at 0.21</td></tr>
<tr><td>1 month — 1 year</td><td>Start at 8 — 12 L/min and increase by 1 L/min as work of breathing requires.</td><td rowspan="4">Start at 0.60 and titrate as needed to achieve target SPOT.
*if SPOT is greater than 92%, start at 0.21</td></tr>
<tr><td>1 - 6 years</td><td>Start at 12 -20 L/min and increase by 1 L/min as w0fk Of breathing requires.</td></tr>
<tr><td>6 - 12 years</td><td>Start at 20 —25 L/min and increase by 1 - 2 L/min as work of breathing requires</td></tr>
<tr><td>12 — 18 years</td><td>Start at 25 L/min and increase by 2 L/min as work of bfeathing requires</td></tr>
</table>

Appendix 7.5 Vapotherm Pediatric Weaning Guidelines



Appendix 7.6 AIRVO 2

1. **Intended Use:**
   - 1.1 The AIRVO 2 is for the treatment of spontaneously breathing patients who would benefit from receiving high- flow warmed and humidified respiratory gases. This includes patients who have had upper airways bypassed. The how may be from 2 — 60 L/min, depending on the patient interface.
     - 1.1.1 Junior Flow Cannulas: 2 —20/25 L/min
     - 1.1.2 Adult Cannulas: 10 — 50/60 L/min
2. Required Equipment and Supplies:
   - 2.1 AIRVO 2 unit (which includes, the AIRVO 2, IV pole, and high-flow how meter [0-70 Umin])
   - 2.2 The heated breathing tube and chamber kit (water chamber, chamber adapter, heated breathing tube.
   - 2.3 Sterile water in a bag.
   - 2.4 Appropriate-sized patient interface
     - 2.4.1 Adult Nasal Cannula:
       - 2.4.1.1 Small (10 — 50 Umin)
       - 2.4.1.2 Medium (10 — 60 Umin)
       - 2.4.1.3 Large (10 - 60 Umin)
3. Assembling Equipment and Supplies:
   - 3.1 Open the heated breathing tube kit and remove the water chamber.
   - 3.2 Remove the water chamber cover and connect the chamber adapter, clipping the water supply tube into position.
   - 3.3 Insert water chamber into AIRVO 2 unit.
   - 3.4 Attach the sterile water bag to the IV pole and connect the water tubing.
   - 3.5 Open the vent cap on the bag spike. The water will begin to fill the chamber.
   - 3.6 Connect one end of the heated breathing tube to the AIRVO 2 unit
   - 3.7 Plug the AIRVO 2 unit into the red electrical outlet.
   - 3.8 Turn the AIRVO 2 unit on and verify that the disinfection status is "green".
   - 3.9 Do not use "Junior Mode". If Junior Mode is active, press and hold the mode button for 5 seconds to switch to modes
   - 3.10 Connect the oxygen source to the oxygen inlet port on the side of the AIRVO 2 unit.
   - 3.11 Press the "Mode™ Button to configure settings:
     - 3.11.1 Temperature:
       - 3.11.1.1 The target temperature should be set to 37 ° C. If non-compliance is an issue, changed to 34° C.
     - 3.11.2 Flow:
       - 3.11.2.1 The AIRVO 2 low rates can be set between 10 - 60 Umin, in increments of 1 Umin (10- 25 Umin) arid 5 Umin (25-60 Umin).
     - 3.11.3 Fi02:
       - 3.11.3.1 Adjust the level of oxygen from the oxygen source, until the desired Fi02 is displayed on the screen.
         - 3.11.3.1.1 Real-time 02 measurement is displayed when 02 is greater than 25% and less than 95%. However, not that FI02 below 25% and above 95% will be displayed as 21% and 100% respectively.
     - 3.11.4 Note: If the oxygen fraction exceeds 95%, the oxygen reading will pulse red and the device will beep
     - 3.11.5 Connect interface to a heated breathing tube.
     - 3.11.6 Connect interface to patient.
   - 3.12 Condensation Management:
     If excess condensate accumulates in the heated breathing tube, disconnect the patient interface from the heated breathing tube, and drain the condensate by lifting the patient end of the tube, allowing the condensate to run into the water chamber.
   - 3.13 Refer to the AIRVO 2 Disinfection Kit Manual for cleaning and high-level disinfection after every use.