T-Piece Ventilation

Purpose

Provide staff with information on T-piece resuscitators available for use.

Policy Statement

The T-piece system allows for resuscitation and intermittent ventilation with greater precision and consistency than ventilation with either a flow-inflating or self-inflating bag resuscitation device. Therefore, this system is preferred for situations where resuscitation or portable ventilation is necessary. T-piece provides flow-controlled and pressure limited breaths and works only when gas from a compressed source flows into it.

Applicability

All Covenant Health Neonatal staff.

Principles

There are three t-piece ventilation systems in use. The GE T-piece resuscitator available on the Giraffe and Panda warmers, Disposable T-piece and the Neopuff® T-Piece Resuscitator.

NOTE:

Neopuff available only in emergency department at the Misericordia Community Hospital. Neopuff available in emergency department, caseroom and portable available for use in NICU at the Grey Nuns Community Hospital.
**GE- T-Piece Resuscitator**

**Procedure**

- Suction control knob
- Medical gas On/Off switch
- Oxygen tank gauge
- Air tank gauge
- Airway pressure manometer
- PIP override release
- Flow meter control knobs
- T-piece gas outlet
- Blender control knob

**PEEP End**

**T-Piece**
Procedure

VENTILATION WITH A T-PIECE RESUSCITATOR

ACTION | RATIONALE
--- | ---
1. Perform hand hygiene
2. Ensure gas flow to T-piece resuscitator.
   a. The GE resuscitator gas source is connected to tanks for transport or to wall sources. Turn the Medical Gas switch on. Set flow Misericordia Hospital 8–10L/min Greynuns Hospital set @ standard flow of 10L/min
   b. Attach tubing from blended gas source to gas inlet port on the Neopuff®. Check flow rate.
   Medical air and oxygen are required to use resuscitator and blended source allows for variable oxygen delivery.
3. Connect one end of corrugated tubing to gas outlet port on resuscitator box and the other to the T-piece / pressure modulator. The corrugated tubing connects the gas source and pressure modulator / T-piece that interfaces with the airway device.

4. Test maximum peak inspiratory pressure (PIP) and positive end expiratory pressure (PEEP) by occluding open end of T-piece with palm of your hand or test lung and covering the PEEP opening on the top of the tubing end. This test helps to provide sufficient pressures for ventilation while minimizing excessive pressures. Settings should be 24 PIP and 6 PEEP as standard settings. For patients on ventilators, the initial settings should match the current PIP and PEEP the patient receives from the ventilator.

5. Adjust PIP on GE device, disposable T-piece and Neopuff® by turning the inspiratory pressure control knob. If a PIP of > 30 cm H₂O is required the pressure control knob (yellow) needs to be depressed then turned for the GE device. PIP is adjusted to achieve minimal chest excursion on the patient.

6. Adjustable PEEP dial on all devices Located at end of corrugated tubing (or top portion of T-Piece) Achieved PIP and PEEP may vary with leaks between resuscitator and patient interface.

7. Attach the open end of the T-piece to a mask or artificial airway end. Attaching the device provides constant pressure (CPAP) at the PEEP level. Place a finger or thumb over the small opening to provide PIP. The length of time that the opening is occluded determines the length of the ventilated breath. Monitor measured PIP and PEEP given on airway pressure gauge seen on resuscitator box.

8. Remove digit from opening to end ventilated breath.

9. Adjust oxygen as required.
   a. Oxygen dial is adjusted on the GE device.
   b. Adjust oxygen flow rate on disposable T-piece
   b. Gas source on the Neopuff® is adjusted to change oxygen concentration.
SETUP PROCEDURE FOR GIRAFFE and PANDA ® WARMER T-PIECE RESUSCITATOR

<table>
<thead>
<tr>
<th>ACTION</th>
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<tbody>
<tr>
<td>1. Perform hand hygiene.</td>
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</tr>
<tr>
<td>2. Ensure the air and oxygen cylinders are open if the resuscitator will be used for transport. The resuscitator may be used with gas wall sources. Turn gas flow switch to the &quot;on&quot; position.</td>
<td>Resuscitator is gas-powered. Medical air and oxygen provide variable oxygen concentrations.</td>
</tr>
<tr>
<td>3. Connect corrugated tubing and T-piece to gas outlet port on resuscitator box.</td>
<td>Corrugated tubing and T-piece will be attached to patient airway interface.</td>
</tr>
<tr>
<td>4. Set the gas flow to the resuscitator to MCH 8-10L/min GNCH 10L/min</td>
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<tr>
<td>5. Keep end cap on T-piece end.</td>
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<tr>
<td>6. Occlude the opening of the PEEP control knob on the T-piece.</td>
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</tr>
<tr>
<td>7. Turn the PIP control knob on the front panel fully clockwise beyond the yellow override release. Verify that 45 cm H₂O can be obtained on the airway pressure manometer. While keeping the PEEP control knob on the circuit occluded, turn the PIP control knob on the front panel counterclockwise to set the PIP level patient is ventilated with or 24 cm H₂O.</td>
<td>The yellow override release must be depressed to obtain PIP greater than 35 cm H₂O to prevent excessive ventilation pressures.</td>
</tr>
<tr>
<td>8. Adjust PEEP valve (plastic knob on T-piece end) by rotating it to reach 6 cm H₂O or the level your patient is to receive. This is the standby PEEP setting.</td>
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<tr>
<td>9. Adjust the blender control knob to set the desired FiO₂ from 0.21 to 1.00.</td>
<td></td>
</tr>
<tr>
<td>10. Check air and oxygen tank pressures. Change tanks when the pressure drops below 500 psi. (Greynuns - inform Respiratory of tank change required)</td>
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</table>
11. Turn the medical gas switch to “Off” until ventilation with device is necessary.

## SET UP PROCEDURE FOR NEOPUFF®

<table>
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<tr>
<td>1. Perform hand hygiene.</td>
<td>Resuscitator is gas-powered. Medical air and oxygen provide variable oxygen.</td>
</tr>
<tr>
<td>2. Turn air and oxygen cylinders on.</td>
<td>Corrugated tubing and end piece are attached to patient interface.</td>
</tr>
<tr>
<td>3. Connect corrugated tubing to gas outlet port on resuscitator box.</td>
<td>The oxygen source should be blended to provide varying levels of oxygen as required.</td>
</tr>
<tr>
<td>4. Connect oxygen tubing from the oxygen source flow meter to the gas inlet port on the resuscitator box.</td>
<td>Maximum pressure relief prevents use of excessive pressures for ventilation of the neonate.</td>
</tr>
<tr>
<td>5. Set the gas flow to the resuscitator to MCH 8-10L/min GNCH 10L/min</td>
<td>Maximum pressure relief prevents use of excessive pressures for ventilation of the neonate.</td>
</tr>
<tr>
<td>6. Occlude opening on T-piece resuscitator.</td>
<td>Maximum pressure relief prevents use of excessive pressures for ventilation of the neonate.</td>
</tr>
<tr>
<td>7. Turn maximum pressure relief knob fully clockwise. Turn inspiratory pressure control knob clockwise until a pressure of 50 cm H₂O is reached. Turn maximum pressure relief knob counter-clockwise until the pressure drops to 35 cm H₂O. You have just set the maximum pressure relief.</td>
<td>Maximum pressure relief prevents use of excessive pressures for ventilation of the neonate.</td>
</tr>
<tr>
<td>8. Turn inspiratory pressure control knob counter-clockwise until the pressure drops to 24 cm H₂O. This is the standby PIP setting.</td>
<td>Maximum pressure relief prevents use of excessive pressures for ventilation of the neonate.</td>
</tr>
<tr>
<td>9. Adjust PEEP valve (white plastic on T-piece end) to reach 6 cm H₂O. This is the standby PEEP setting.</td>
<td>Maximum pressure relief prevents use of excessive pressures for ventilation of the neonate.</td>
</tr>
<tr>
<td>10. Ventilate test lung by occluding the opening on the T-piece end intermittently. Verify on the pressure manometer that the preset parameters are achieved.</td>
<td>Maximum pressure relief prevents use of excessive pressures for ventilation of the neonate.</td>
</tr>
</tbody>
</table>
11. Check air and oxygen tank pressures. Change tanks when the pressure drops below 500 psi. *(Greynuns - inform Respiratory of tank change required)*

12. Turn tanks off. Turn flow to Neopuff® off.

13. In delivery room, check supply inventory for adequate supplies. Supplied to be readily available for emergency situation

**Related Documents**


**References**

*T-Piece Ventilation August 2011*

**Revisions**

Sept 2012  
Dec 2015
Signing

GAIL CAMERON
SENIOR DIRECTOR OPERATIONS
MATERNAL, NEONATAL & CHILD HEALTH PROGRAMS
COVENANT HEALTH
GREY NUNS & MISERICORDIA HOSPITALS

DATE

Original signed

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Dr. Sharif Shaik
MEDICAL DIRECTOR
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