PROCEDURE FOR CHECKING VENTILATOR

PROCEDURE

Standard ventilator features that must be checked upon assuming care and prn, which includes:

1. Power Source
   - Internal battery
   - External battery
   - Accessible, functioning electrical wall outlets
   - Battery Life in hours documented in Tracheostomy Care Notebook
   - Emergency power supply

2. Oxygen source
   - Connection to ventilator and spare tubing
   - Full tank of oxygen, with gauge

3. Humidification source if ordered.

POINTS TO REMEMBER

Clarify what power source will be used on campus during school hours.

The internal battery is generally a 12-volt DC battery intended for emergency use only.

If the electrical cord is used, the cord must be grounded (3 prong plug/socket). If the student is in one place for an extended period of time, the ventilator should be plugged in to maintain battery for transport.

An oxygen source may be included, if ordered.

Oxygen may be supplied in gas or liquid form. Ensure adequate supply of oxygen is available for the day. Identify flow in liters per minute (LPM).

Identify emergency power source at the school site.

Refer to manufacturer guidelines for battery life.
PROCEDURE

4. Alarms
   - High and low pressure
   - Volume
   - Power source

5. Other equipment that must be checked daily
   - Resuscitation device (BVM)
   - Spare tracheostomy tubes and supplies
   - Suctioning equipment
   - Saline dosettes, if ordered
   - Other supplies as indicated, i.e., ventilator tubing

POINTS TO REMEMBER

Caution always should be taken not to block or obstruct the ventilator tubing.

Alarms **MUST** never be turned off. All ventilator alarm settings **MUST** be written on the emergency card posted on a visible side of the ventilator.

Each student who travels to school with a ventilator should have a supply bag containing all of these supplies. This bag should be checked before the student boards the bus. The equipment check must be documented daily on the **Tracheostomy Equipment Checklist**. A supply bag includes a manual resuscitation bag, spare tracheostomy tubes and supplies, and suctioning supplies.
VENTILATOR DEFINITIONS

**TERMINOLOGY**

Ventilator settings are prescribed for a student by the licensed health care provider and should be checked upon assuming care, or more frequently if the student’s status changes.

- **Tidal volume**
- **Respiratory rate**
- **Oxygen percentage or LPM**
- **Peak inspiratory pressure (PIP)**
- **Pressure support**
- **Positive end expiratory pressure (PEEP)**
- **Ventilator mode**
- **Inspiratory Pressure/Time (“I” Time)**
- **High-pressure alarm**
- **Low-pressure alarm**
- **Power source alarm**

**POINTS TO REMEMBER**

A safety card, stating the student’s ventilator settings, should be mounted on the ventilator and easily visible.

- The amount of air in each breath and is determined by the student’s size.
- Number of breaths delivered in a minute and determined by student’s condition and size.
- Percentage is based on the individual student’s needs. Room air is 21%.
- The amount of pressure required to inflate the lungs to the prescribed tidal volume.
- A spontaneous mode of ventilation where the student initiates the breath and the ventilator delivers support with a preset amount of pressure.
- The amount of pressure needed to keep the lungs from totally collapsing after exhalation.
- The type of respiratory support administered to the student: Intermittent mandatory ventilation (IMV), assist-control, or synchronized intermittent mandatory ventilation (SIMV). The prescribed mode will be determined by the student’s condition and respiratory ability.
- The amount of time in the vent cycle used to deliver a breath.
- Reflects an excessive inspiratory pressure; may indicate increased resistance or obstruction.
- Indicates too-low an inspiratory pressure. Warns of a leak in the system; may signal that adequate volume is not being delivered.
- Indicates a change in power; alarms should never be turned off.
### MECHANICAL POSSIBLE PROBLEMS THAT REQUIRE IMMEDIATE ATTENTION

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<tr>
<th>OBSERVATION</th>
<th>REASON/ACTION</th>
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<td>1. Student appears to be in distress:</td>
<td>Immediately check and reassure the student. Call for assistance. <strong>Never leave the student alone.</strong></td>
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<tr>
<td>• Increased shortness of breath</td>
<td>The symptoms may be caused by:</td>
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<td>• Agitation</td>
<td>• Occlusion of the tracheostomy tube by a plug or secretions</td>
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<td>• Blueness or pallor of lips, nail beds</td>
<td>• A dislodged tube or other airway problems</td>
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<td>• Retractions</td>
<td>• Student may be coughing or have increased activity level that raises pressure transiently</td>
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<td>• Confusion</td>
<td>Check to see if the ventilator tube is disconnected from the student.</td>
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<td>• Rapid or pounding pulse</td>
<td>Check to see that the power source is functioning and that oxygen supply is adequate.</td>
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<tr>
<td>2. The tracheostomy tube is dislodged.</td>
<td>Disconnect the student from the ventilator and use manual resuscitator bag if needed while attending to the student’s needs.</td>
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<td>3. The tracheostomy tube is blocked.</td>
<td>Replace the tube.</td>
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<td>4. The student has increased secretions.</td>
<td>Attempt to suction; instill saline if indicated. If unsuccessful, replace tube.</td>
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<td>5. The student is wheezing.</td>
<td>Suction the tracheostomy.</td>
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<td>6. The student continues to be in distress or becomes unconscious.</td>
<td>Administer bronchodilators by nebulizer, if ordered, and suction as necessary.</td>
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<td>7. Distress is relieved by disconnecting student from ventilator and using manual resuscitation.</td>
<td>Call 911 if suctioning is ineffective or if unable to replace trach tube.</td>
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<td>Continue using manual resuscitator (BVM – with supplemental oxygen, Licensed nurses only) until EMS arrives.</td>
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<td>Call 911 and begin CPR if indicated.</td>
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OBSERVATION

8. The power supply is not functioning.

9. An alarm is activated:
   - Low-pressure alarm/apnea alarm is a continuous audible alarm and is usually accompanied by a flashing red light on the ventilator front panel.
   - High-pressure alarm is an intermittent alarm usually accompanied by a flashing red light.
   - Power alarm is continuous, usually accompanied by a flashing light as well.

Note: If the condition that caused this alarm to be triggered is stopped with the next breath, the audible alarm will stop, but the visual alarm will need to be reset.

REASON/ACTION

Ventilate student with manual resuscitator until back-up supply is in operation.

Always check student first. If student is stable, proceed with checking the ventilator for possible tubing disconnections.

This alarm may be activated by the following:
   - The student may be disconnected from the ventilator
   - The tracheostomy tube is no longer in place

If the student is in distress, remove the student from the ventilator and give breaths with the BVM and then check the ventilator.

Always check student first and then proceed with checking the ventilator for possible tube complications.

This alarm may be activated by the following:
   - The student may need to be suctioned for secretions or a mucus plug
   - This may indicate increased resistance or obstruction
   - The ventilator tubing is obstructed (kinked)
   - The ventilator tubing may be obstructed
   - The tracheostomy tube may be dislodged
   - The student may be coughing, sneezing, talking or laughing, which raises pressure transiently

If the student is in distress, remove the student from the ventilator and give breaths with the BVM and then check the ventilator.

Check to see that power source is functioning; that is, AC power, internal and external battery. The alarm may sound if power source is interrupted, as with a power failure or battery change. If all three power sources fail, remove student from ventilator. Give breaths with BVM and Call 911.