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VPAP ST Operational Checklist and Instructions for Use (Version 2.1)

Advisory on the Use of ResMed VPAP ST

(ResMed, Australia; ResMed USA, San Diego)

Because of an automatic shut-off feature in the ResMed bilevel (S9 VPAP and AirCurve), these devices should NOT be used for invasive ventilation unless no other options exist.

The ResMed VPAP ST is designed to be a *noninvasive* ventilator. Incorporation of supplemental oxygen at > 15 LPM into the circuit anywhere distal to the blower should be undertaken with extreme caution.

At a set CPAP or EPAP > 10 cmH₂O, oxygen flows > 15 LPM in a circuit with a standard exhalation port can result in an unanticipated device shut-off and patient harm. This shut-off does not occur at EPAP ≤ 10 cm H₂O or when O₂ flow < 15 LPM.

At supplemental oxygen flows of 15 LPM, the maximum achievable FiO₂ will be no higher than 60%. If a patient requires FiO₂ > 60% or PEEP > 10 cmH₂O, the use of another brand of bilevel or a conventional invasive ventilator should be considered.

Exercise extreme caution when EPAP requirements exceed 10 cmH₂O and FiO₂ requirements exceed 60%!

This document should be used as a clinical adjunct to the protocol “Repurposing bi-level ventilators for use with intubated patients while minimizing risk to health care workers during insufficient supply of conventional ventilation for patients with COVID-19” and is shared with our health care colleagues to increase knowledge about potential solutions to increase the capacity and access to mechanical ventilation during the COVID-19 crisis. Icahn School of Medicine does not warrant the contents or effectiveness of the protocol, and the use and implementation of this protocol should be first reviewed and evaluated with each hospital’s medical staff.

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Ensure that emergency ventilator equipment (i.e. the patient's original ventilator connected to an oxygen source or Ambu-Bag®) is readily available in the event of device malfunction.

BEFORE ROOM ENTRY:

- Have the following ready:
 - VPAP ST machine with power brick and cable
 - Pre-assembled "VPAP Circuit Kit" with tubing and components
 - Rolling cart or Mayo stand
 - GE Carescape B450 freestanding monitor. **Keep this outside of the negative-pressure isolation room.**
- Connect the gas sampling line and spirometry connector to the GE monitor.
- Don appropriate PPE per institutional protocol.
- Enter the room with the VPAP ST, circuit kit, and rolling cart.
 - Be sure to not disconnect the gas sampling line from the GE monitor.

AFTER ROOM ENTRY:

- Move the patient so the endotracheal tube is less than 5 feet away from the door.
- Plug in VPAP ST to an outlet capable of backup generator power (this is a **red outlet** in most hospitals) in the event of power outage.
 - If using Tx-Link, see *Home Bi-level to Vent Modification - Tx Link Hardware Setup*
- Connect the **pre-assembled circuit** to the VPAP ST. **Do not disconnect the patient from the ventilator.**
- Connect O₂ line to wall regulator.
- Adjust O₂ flow to 15 LPM per clinical protocol.
- Turn the VPAP machine on by pressing the power button.

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- ❑ To enter “Clinical Mode” on the VPAP ST, hold down the knob and the lower button simultaneously for about 3 seconds.



- ❑ Press the button on the knob to select a menu or field.



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- Rotate the knob to navigate the menus



- Press the lower button to go back



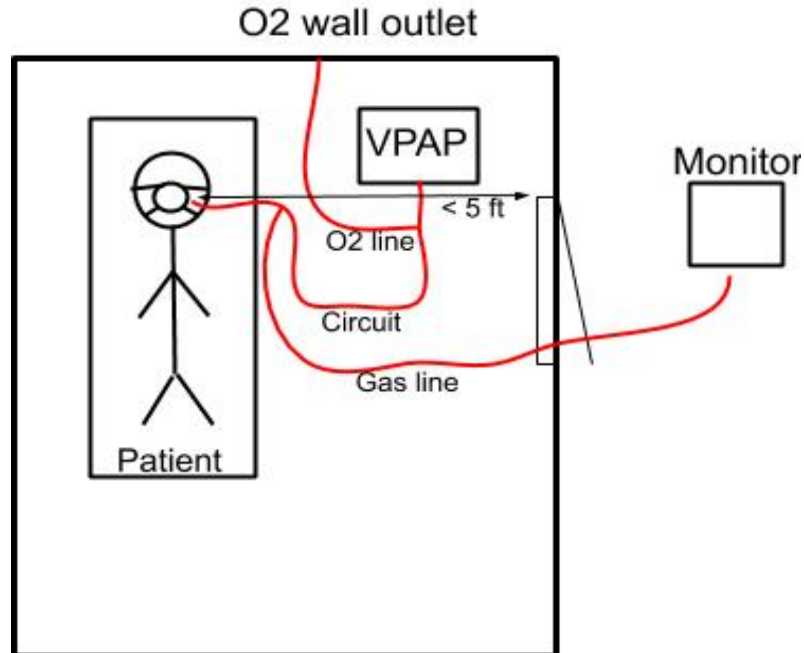
Before attaching the circuit to the patient’s endotracheal tube, perform final safety checks:

- Check circuit for uncapped openings
- Confirm VPAP settings
- Confirm O₂ flow rate

- Disconnect the patient from the ventilator. **CAUTION: THIS IS AN AEROSOLIZING PROCEDURE.**
- Connect the VPAP ST circuit to the endotracheal tube. Confirm that the VPAP ST is delivering set tidal volumes.
- Leave ventilator accessible at the patient’s bedside, if possible.

CAUTION: DO NOT TURN OFF THE VPAP ST ONCE THE PATIENT IS CONNECTED.

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