SPONTANEOUS VENTILATORY PARAMETERS

PURPOSE: To determine a patient's capability to maintain his/her own ventilatory status.

POLICY: 1. Obtain parameters on patients when requested by physician.
2. The following parameters shall be obtained when patient cooperation/toleration permits:
   a. Negative Inspiratory Force (NIF)
   b. Spontaneous respiratory rate
   c. Slow Vital Capacity (VC)
   d. Minute Ventilation (VE)
   e. VT (obtained by VE/RR) average VT in that minute.
3. All values will be charted on Respiratory Care Progress Notes or Ventilator Flow Sheet.

EQUIPMENT:
1. Ventilator Monitor Kit
2. Respirometer
3. NIF manometer
4. Mouthpiece (for all patients without artificial airways)
5. Nose clip, optional
6. Bacterial Filter

PROCEDURES:
1. Respiratory Rate (RR) and Minute Volume (VE)
   a. Obtain monitor kit, assess type of airway, and obtain mouthpiece if necessary.
   b. Assemble monitor kit, noting placement of one way valves that allow for inspiration/expiration.
   c. Place bacterial filter proximal to respirometer and attach respirometer to expiratory side of valve assembly.
   d. Attach monitoring device to airway or place mouthpiece between patient's lips. If mouthpiece is used be sure lips are properly sealed around mouthpiece and patient does not breathe through nasal passages (noseclip is preferred).
   e. Instruct patient to relax and breathe as normally as he/she can. NOTE: Patients who have just been removed from mechanical ventilation may require a short period of time to begin to breathe spontaneously.
   f. Reset the volume indicator to zero and not any patient monitors (heart rate, pressure, etc.). Begin a minute count of respiratory rate. At end of minute remove device and return patient to previous support.
   g. Chart respiratory rate, minute volume, and calculate average tidal volume.
   h. These parameters (RR, VE, and VT) may be obtained via monitoring capabilities on the mechanical ventilator with CPAP/PS mode (PS 0 and PEEP 0 cmH2O) with appropriate sensitivity setting.
2. Slow Vital Capacity
   a. Using the same setup as in the above procedure, reattach device to patient's airway. Observe any patient monitors for any change in patient's condition.
   b. Instruct patient to exhale slowly and completely. At end expiration, instruct patient to inhale deeply and then exhale slowly and completely.
   c. Note volume exhaled. Repeat procedure one to two times and record
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best effort. If necessary place patient back on ventilatory support between efforts and document tolerance.

3. NIF
   a. Obtain negative inspiratory force manometer and ventilator monitor kit.
   b. Attach manometer to stem on T-piece from ventilator monitor kit and attach T-piece to patient's ET-tube or mouthpiece to allow for spontaneous inhalation and exhalation through the one-way valves. A bacterial filter shall be in place between the NIF meter and the T-piece.
   c. Instruct patient to attempt 8 to 10 maximum inspiratory efforts while occluding the inspiratory side of the T-piece. Note the maximum negative inspiratory force achieved.
   d. Discontinue the procedure before 8 to 10 breaths are achieved if the maximum negative inspiratory force begins to decrease or if the patient shows signs of fatigue.

ACCEPTABLE WEANING PARAMETERS
   a. VC (10-15ml/kg of ideal body weight)
   b. VT (2-3ml/kg of ideal body weight)
   c. RR (less than 25/minute)
   d. NIF (-20 to -25cm H20)

NOTE: Between patients, the filters and monitor kit shall be replaced, and the respirometer and NIF meter shall be wiped off with aseptic spray. Also once per week the respirometer and NIF meter will be sent to CMS for sterilizing.

O2 tubing to port

Insp filter

To pt (ETT or MP)
Exp side

Close ports

To ETT or MP

REFERENCES:
2. Clinical Practice standards of and recommendations from Critical Care and Pulmonary Medicine. Approval of Medical Director.
3. Shapiro, Barry A., Clinical Application of Respiratory Care

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