



KENYA SOCIETY OF ANAESTHESIOLOGISTS

Safe Anaesthesia

VENTILATOR PROTOTYPE MUST HAVES

1. PHYSICAL PROPERTIES.

- a). Able to operate at temperatures ranging from 14* to 50* centigrade and for at least 24 hours a day continuously for at least 14 days.
- b). Able to operate reliably at sea level up to 2500m above sea level
- c). Robust, compact, easy to clean (disinfect) and hardy
- d). Have an inbuilt oxygen concentrator as well as ability to connect to an external oxygen source.
- e). Able to work off a 240 voltage power supply
- f). A rechargeable battery with a long life exceeding 15 hours
- g) Standard ventilator tubing attachment points. An arm supporting the weight of these tubing is necessary but not mandatory.
- h). an oxygen sensor (fuel cell) on the inspiratory limb of the ventilator tubing.
- i). Impermeable exterior surface

2. VENTILATORY INDICES TO BE SET, MEASURED AND ADJUSTED

- a). Tidal volume (inspired {which is set by the operator} and expired)
- b). Airway pressure: maximum of 40 cmH₂O with a relief valve if exceeds 60cm H₂O
- c). Flow rate
- d). Oxygen concentration delivered to the patient
- e) Adjustable Inspiration and expiration times (this can give an I: E ratio as discussed yesterday) as well as inspiratory pause: ratios available should be at least 1:1, 1:2, 1:3, 1:4, 2:1, 3:1.
- f) Rate of breaths delivered per minute (4-60 breaths per minute)
- g). Inspiratory trigger setting from -1 to -3cm of water (can also be flow sensor set)
- h) PEEP (positive end expiratory pressure) ranging from 1 to 20 cm of water

3. VENTILATORY MODES

- a) Volume control ventilation (synchronized to patient trigger effort and also mandatory controlled ventilation)
- b) Pressure control ventilation
- c) Pressure support ventilation (synchronized to patient effort or mandatory)
- d) Continuous positive airway pressure e) **WOULD BE GOOD TO HAVE BIPAP BUT NOT MANDATORY.**



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4. MANDATORY ALARMS (MUST BE AUDIBLE AT OVER TWO METERS AWAY)

- a). Low oxygen concentration of 21% or below
- b). Respiratory rate from below 4 breaths per minute or above 60 breaths per minute
- c). Airway pressures below 10cm of water and above 30cm of water
- d). Low battery with a time of an hour before exhaustion.

5. INFECTION CONTROL

- a). Impermeable exterior
- b) Able to overcome HMEF pressure (usually 1-2 cm H₂O)
- c) All parts coming into contact with the patient must be able to be disinfected or be disposable

6. INCOMING GAS SUPPLY

- a). Incoming gas supply of 6-10 liters per minute (pipeline, cylinder or concentrators as sources have this range)