

Care of a cardiac pt on mechanical ventilation

CVICU New Hires Orientation Day 2

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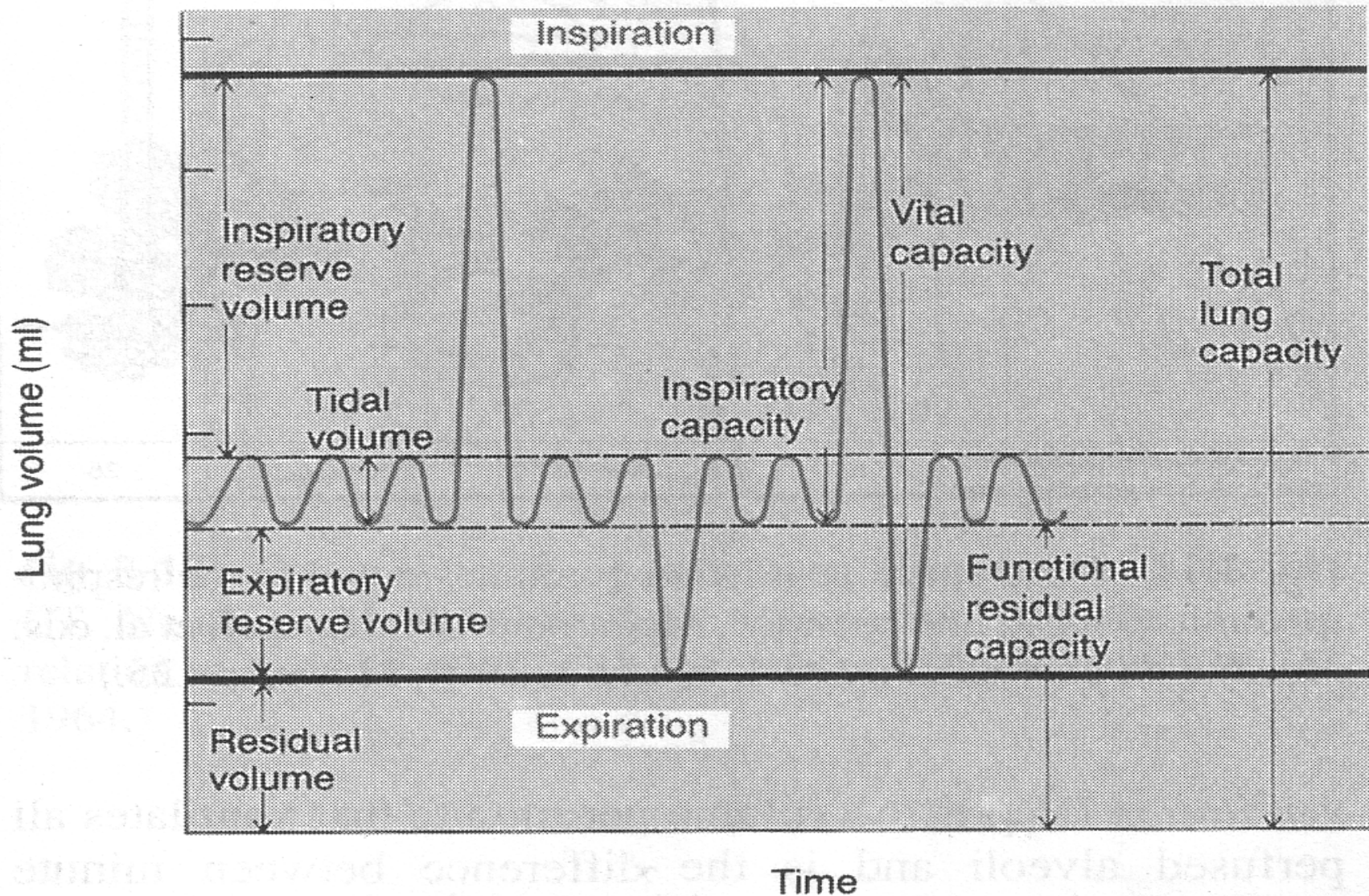
Outline

- Physiology of breathing
- Terminology
- Intubation
- Mode of mechanical ventilation
- Nursing care of a vented pt
- Nursing care of a vented single ventricle pt
- Extubation

Normal Respiration: Terminology

1. Compliance: lung “stiffness”
2. Resistance: inspiratory or expiratory
3. Tidal volume: volume of air inspired in 1 normal breath

Physiology of breathing



Ventilation: Terminology

1. IMV: set respiratory rate
2. PIP: Peak inspiratory pressure
3. PEEP: Positive end-expiratory pressure
4. PS: Pressure support = Mean airway pressure
5. V_T : Tidal volume (6 – 10 mL/kg)
6. MV: Minute volume (RR x V_T)
7. i time: inspiratory time
8. FiO_2 : Fraction of inspired oxygen conc
9. I:E : Inspiration to expiration time ratio (normal = 1:2)

Ventilation Mode

1. IMV: Intermittent mandatory ventilation (thought to be better for weaning; pt maintains use of resp muscle)
2. SIMV: Synchronized intermittent mandatory ventilation (no superimposed breathe)
3. No back up rate (sprinting): PSV, CPAP

Ventilator sub-mode

1. Pressure support or pressure control
2. Volume support or volume control
3. PRVC (SIMV): pressure regulated volume control (dual control mode)

Factors affecting a breathe

1. Pressure
2. Volume
3. Rate
4. Time
5. Synchronized or not

Volume vs Pressure

	Volume control	Pressure control
Cycle	Vol	Time or flow
Trigger	Child and machine	Child and machine
Limit	Flow	Pressure
V_T	Constant	Variable
Peak pressure	Variable	Constant
Advantages	Constant V_T	Avoids excessive PIP
Disadvantages	Risk of barotrauma	Variable V_T risks atelectasis

TABLE 25.6**EFFECTS OF VENTILATOR SETTING CHANGES**

Ventilator setting changes	Typical effects on blood gases	
	Paco ₂	PaO ₂
↑ PIP	↓	↑
↑ PEEP	↑	↑
↑ Rate (IMV)	↓	Min.↑
↑ I:E ratio	No change	↑
↑ Fio ₂	No change	↑
↑ Flow	Min. ↓	Min.↑
↑ Power (in HFOV)	↓	No change
↑ MAP (in HFOV)	Min. ↓	↑

Indications for intubation

- Work of breathing
- Upper airway obstruction
- Actual or potential decrease in airway protection
- Hypoxemia despite max non invasive O₂ supplement
- Inadequate ventilation

Equipment & sequence for intubation

1. CR monitor with QRS tone audible
2. O₂ sat
3. Bag, mask, and O₂ source
4. Suction
5. Meds: paralyzing agent, sedative, and atropine
6. ETT
7. Laryngoscope blade and handle
8. Stylet
9. Ventilator
10. Tape, water-soluble lubricant, and benzoin
11. NG tube
12. CXR
13. ABG

Frequent Oral Care

HOB 30°

Avoid condensation

in circuit back wash into pt

Indications for suction

- secretion in ETT
- Chest auscultation
- V_T (if not volume controlled)
- PIP (if not pressure controlled)
- Desaturation (not definitive esp with cardiac population)
- Extreme caution with: fresh post op, single ventricle, or hemodynamically unstable
- HFOV & iNO: MUST suction with RT

Retaping ETT

2 man job: 1 RT + 1 RN
or
2 RT

No exception!

Extubation

Long term vented pt: sprinting

Is your pt ready?

- Minimal support on vent
- ABG
- Cough, gag reflex intact
- LOC / drive to breath consistently
- Held sedative / morphine infusion and prn
- Little secretion
- Secretion thin and clear/white
- No anticipated status change

Extubation

- Right size mask
- Suction (ETT and oral)
- Extubating to nCPAP or Hiflow?
- Sit pt up / HOB 45°
- Informed family and pt (if appropriate)
- Prep family: there is always a chance of reintubation (not a sign of deterioration!)
- Auscultate lungs
- ABG

NCPAP

HIGH RISK FOR: **PRESSURE ULCER**

- Inspect septum Q shift
- NS drops and suction nares
- Avoid torque with tubing
- Inspect skin where there is pressure