PATHOPHYSIOLOGY

Usually mild elevation of A-a gradient with hypoxemia secondary to V/Q mismatch in the absence of other lung pathologies.

Normal metabolic rate of the body if no sepsis is present.

Lung dynamics consistent with normal compliance, increased resistance, and high expiratory time constant (RC_{exp}).

CONTROL

Determine the ventilator control as the independent variable: volume (VCV) versus pressure (PCV) and apply the equation of motion:

 $\Delta P = R X F + V/C$

R: resistance

F: flow

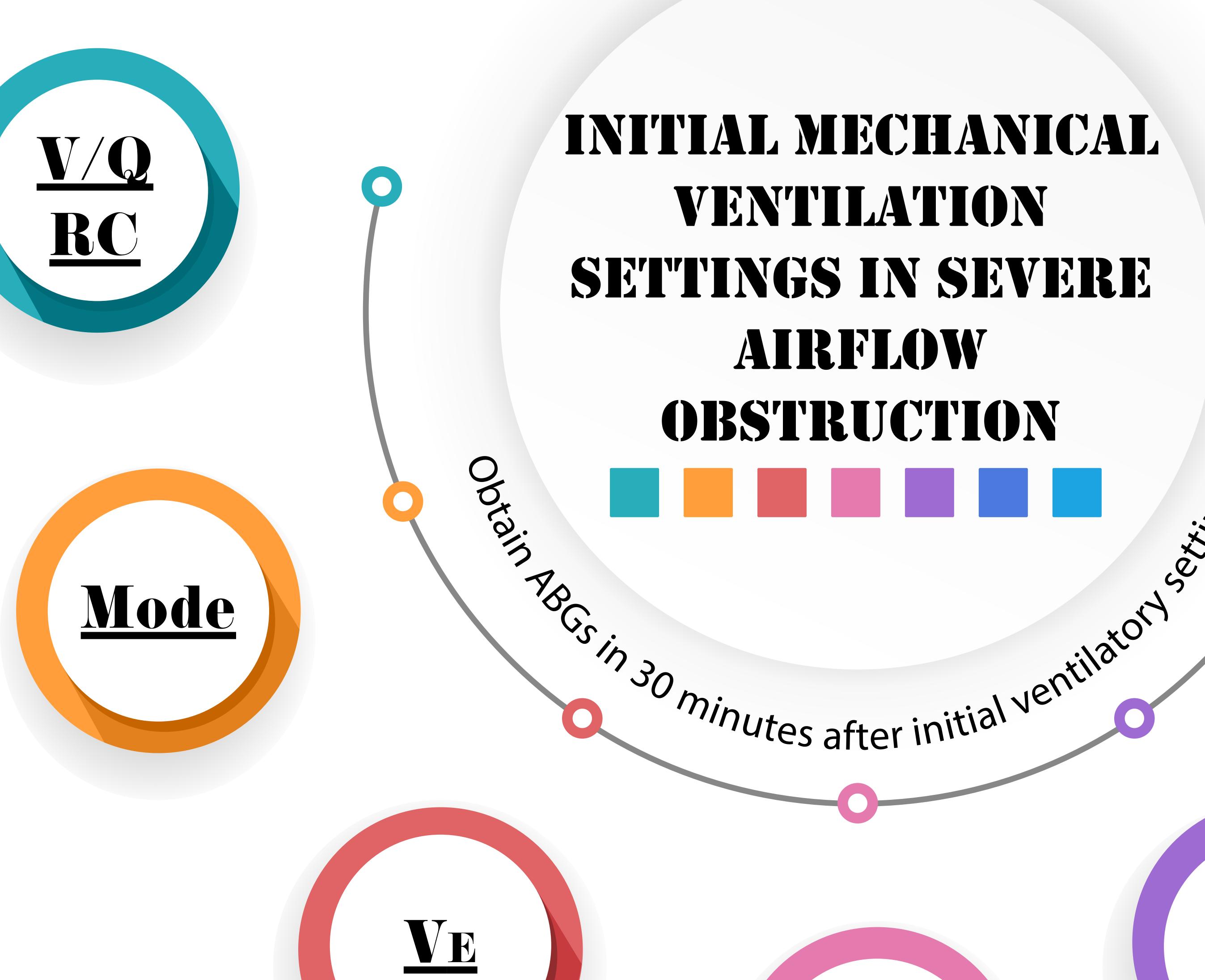
V: volume

C: compliance

As you set the independent variable (V or P), the other variable (P or V) will be dependent on R and C of the respiratory system.

Dual mode (PRVC) is preferred with a targeted tidal volume and pressure regulation.

Keep Pplateau <30 cm H₂O.





Determine the dose of minute ventilation (VE): normal VE (100 mL/kg of IBW) adjusted for the metabolic rate.

If no sepsis, pneumonia or any other condition that increases the metabolic rate, then set the minute ventilation at 100% of normal.

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TIDAL VOLUME

The dose of VT based on IBW (Ideal Body Weight):

6-7 mL/kg of IBW

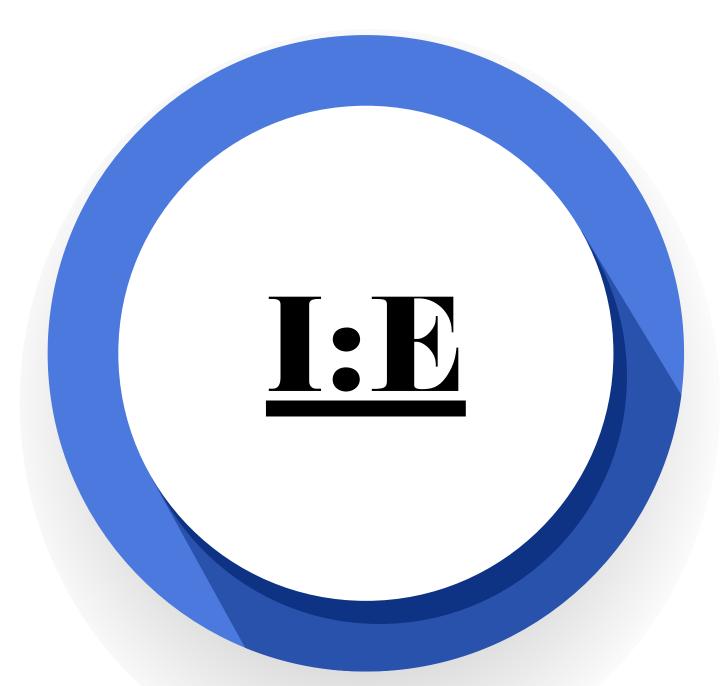
Set the VT at the prescribed dose in VCV or determine the appropriate pressure to deliver the desired tidal volume in PCV.



OXYGENATION

FIO₂: should be initially set at 40-60% and titrated to keep SPO₂ >92%. PO₂

PEEP: set at 5-8 cm H₂O.



I:E RATIO

Set at low I:E ratio (≤1:3) with shortened inspiratory time and prolonged expiratory time.

Time constant is high in severe airflow obstruction, and expiratory time should be at least 2-3X time constant to ensure full expiration and avoid auto-PEEP.

Ensure that expiratory flow returns to zero before the start of the next breath.

RESPIRATORY RATE

Determine the respiratory rate by dividing the minute ventilation over the tidal volume:

RR= VE/VT

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RR is adjusted based on the desired I:E ratio.

