Society of Mechanical Ventilation

Mechanical Power

1) A

Mechanical power depicts the energy transferred to the respiratory system by the ventilator during a certain period of time (J/min)
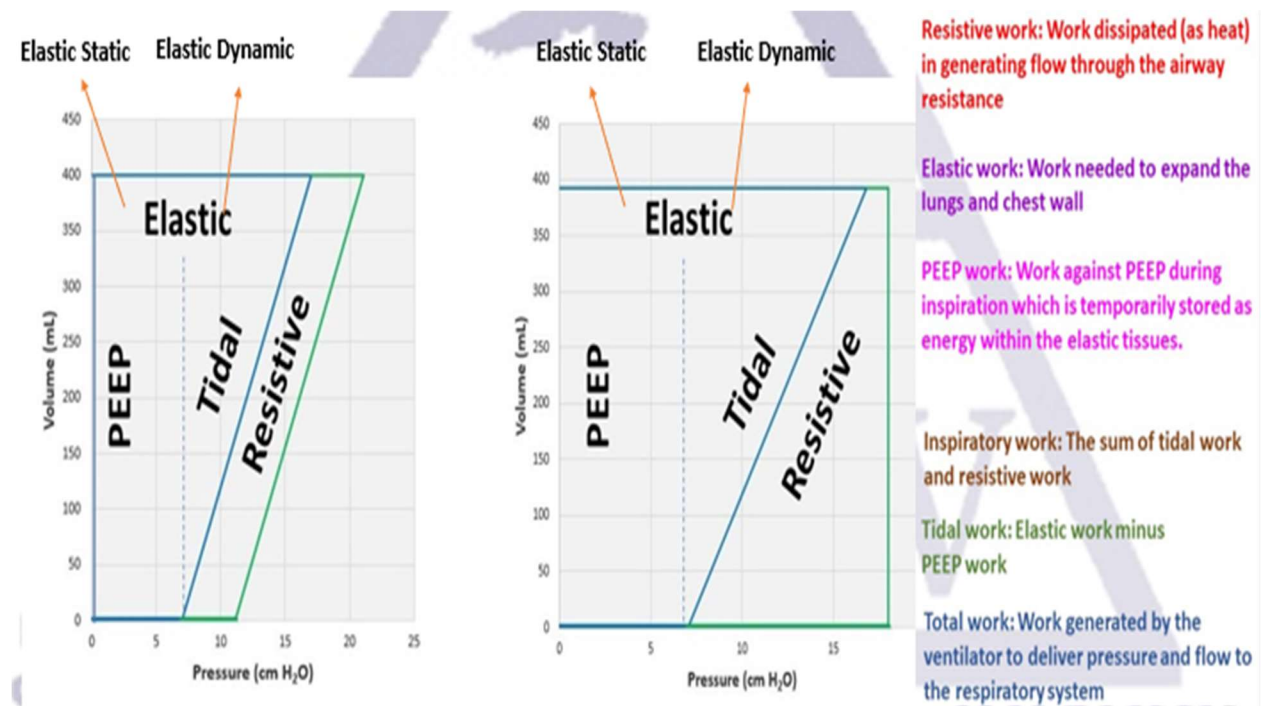Work (J) = Force (P) . Displacement (V)
Mechanical Power (J/minute) = 0.098 . RR (1/minute) . Pressure (cmH2O) . VT (L)

2) A

0.098 is a correction factor to convert energy to power

3) D

Components of mechanical power are [VCV (left) than PCV (right)]

Resistive work: Work dissipated (as heat) in generating flow through the airway resistance

Elastic work: Work needed to expand the lungs and chest wall

PEEP work: Work against PEEP during inspiration which is temporarily stored as energy within the elastic tissues.

Inspiratory work: The sum of tidal work and resistive work

Tidal work: Elastic work minus PEEP work

Total work: Work generated by the ventilator to deliver pressure and flow to the respiratory system

4) C

Figure in answer 3

5) A

Figure in answer 3 shows the area of the P-V curve is smaller in VCV (left) than PCV (right)

6) D

There are many equations to calculate mechanical power in different modes, however the gold standard to calculate the geometrical area of the P-V curve

7) A

Figure in answer 3

8) A

Newer adaptive modes using optimal schemes like ASV and AVM have shown to lower the mechanical power compared to conventional modes

9) C

Unlike the total mechanical power that takes in account the total respiratory elastance, transpulmonary mechanical power takes account of the transpulmonary (lung) elastance.
Transpulmonary mechanical power might be a better target than total mechanical power.

10) The few studies to date have shown that mechanical power is related to VILI and mortality