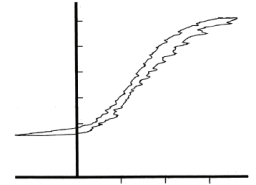
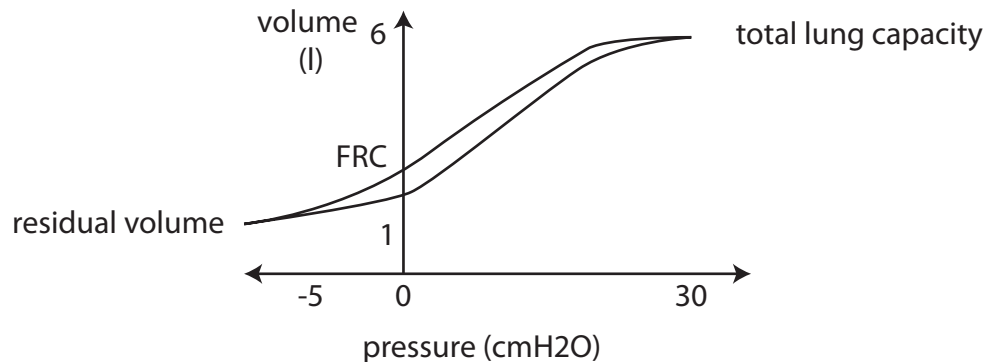


Can you identify this curve and label the axes?



Candidates were tested on their knowledge of pulmonary compliance, its measurement, factors that influence it, surfactant and interpretation of common ventilator waveforms.

This is a pressure volume loop for an air filled lung



“What is compliance”

compliance is the change in volume/change in pressure
it is the inverse of elastance
in the lungs it is roughly 200ml/cmH₂O
the chest is also roughly 200ml/cmH₂O
therefore total lung compliance is equal to around 100ml/cmH₂O
dynamic compliance is measured inbetween inhalation and exhalation
static compliance is measured after a pause (removes the additive effect of tissue/airways resistance)
specific compliance is compliance/FRC

“how is it measured?”

it can be measured using a pressure volume loop where it is the slope
it can be measured by using manouevres on a ventilator
it lung compliance can be measured in isolation using an oesophageal ballon and a spirometer

“What factors do you know of that affect compliance”

Surfactant is the most important factor with respect to compliance
formed by type II alveolar cells, mostly phospholipid DPPC
decreases surface tension, contrary to Laplace, presumably by packing closer together
result is an increase in compliance, prevention of small alveolar collapsing

Lung volumes

as per equation, a greater change in volume = increased compliance
at the base of the lung there is greater expansion therefore increased compliance
larger lungs also have increased compliance

Extremes of expansion

compliance is decreased at full inspiration and expiration
compliance is highest at FRC

Effects of blood volume

compliance is reduced when vasculature is engorged (eg APO)

Pathological changes

unventilated lungs have reduced compliance
emphysema increases compliance
fibrosis decreases compliance