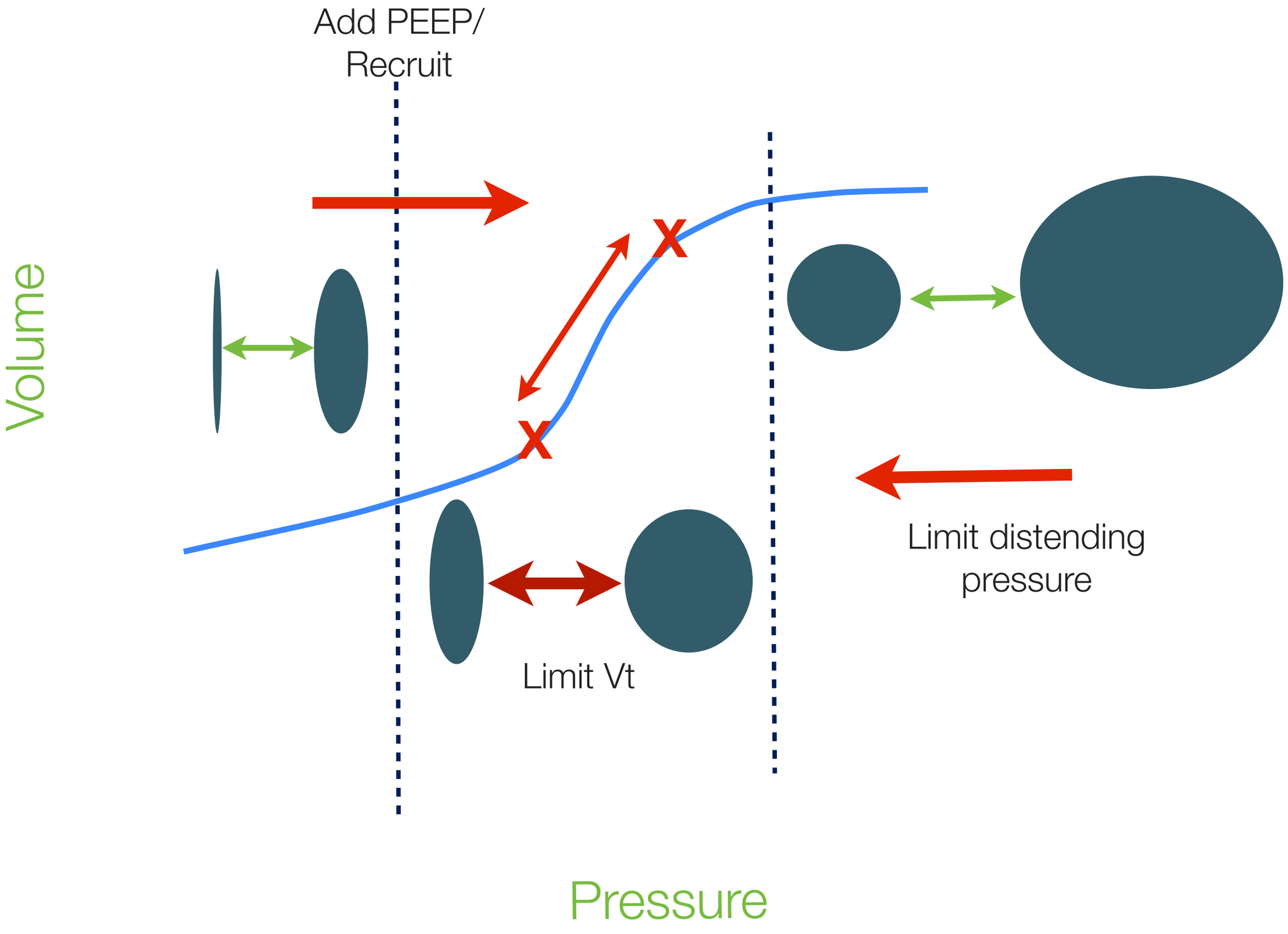
Airway Pressure Release Ventilation

(“APRV”)

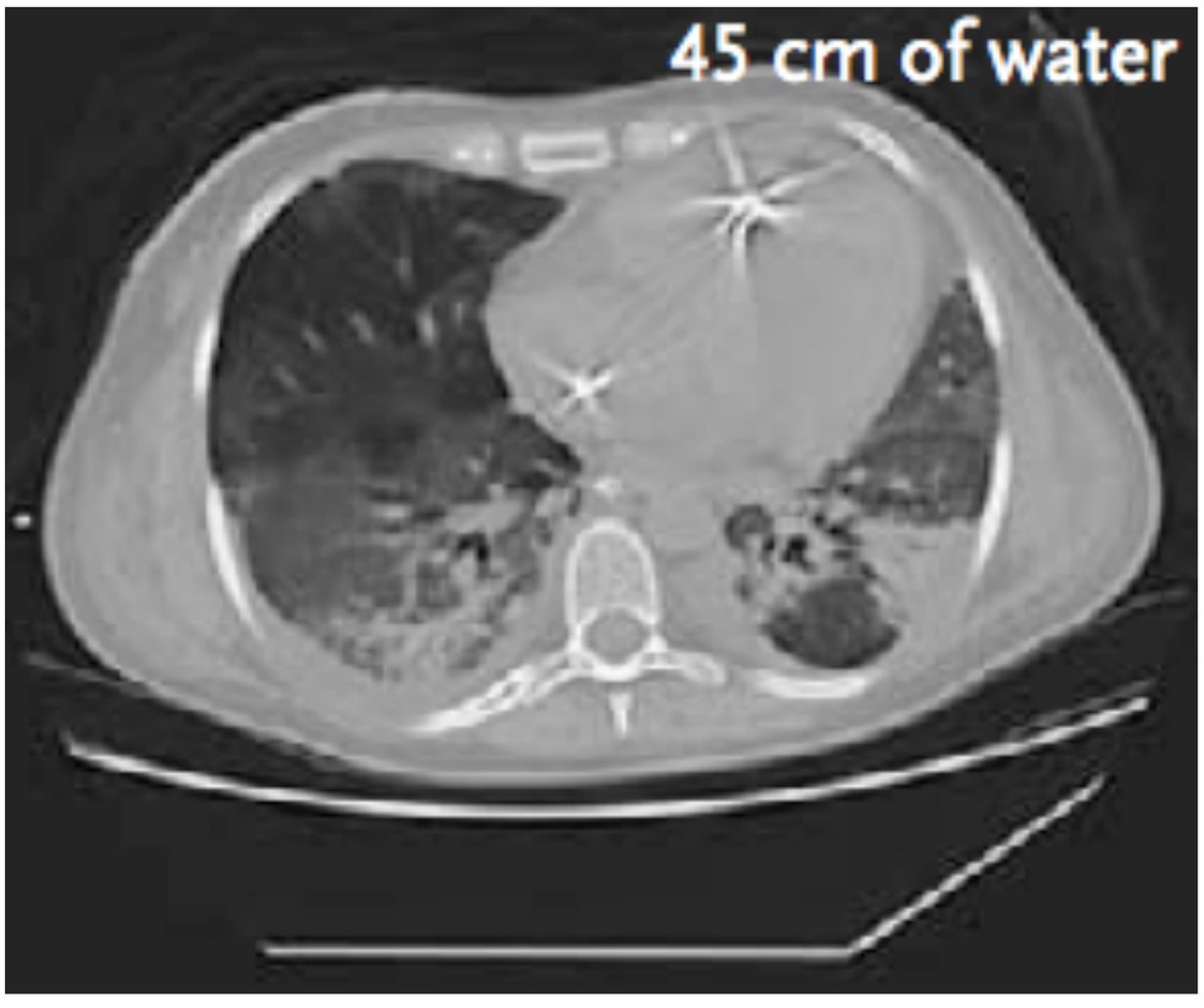
“Lung protective ventilation”

Avoid recruitment/de-recruitment

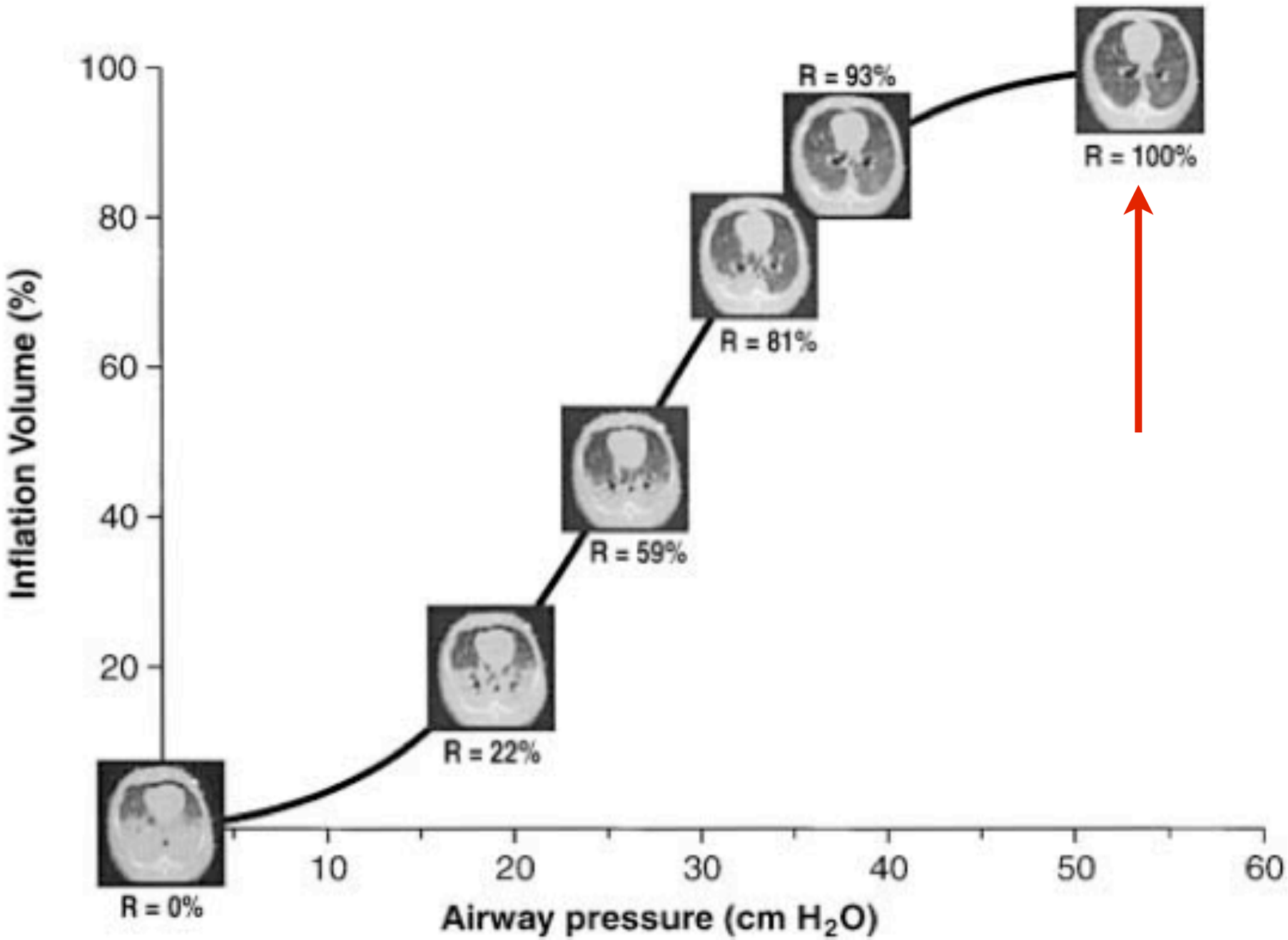
Preventing overdistension and under-recruitment injury



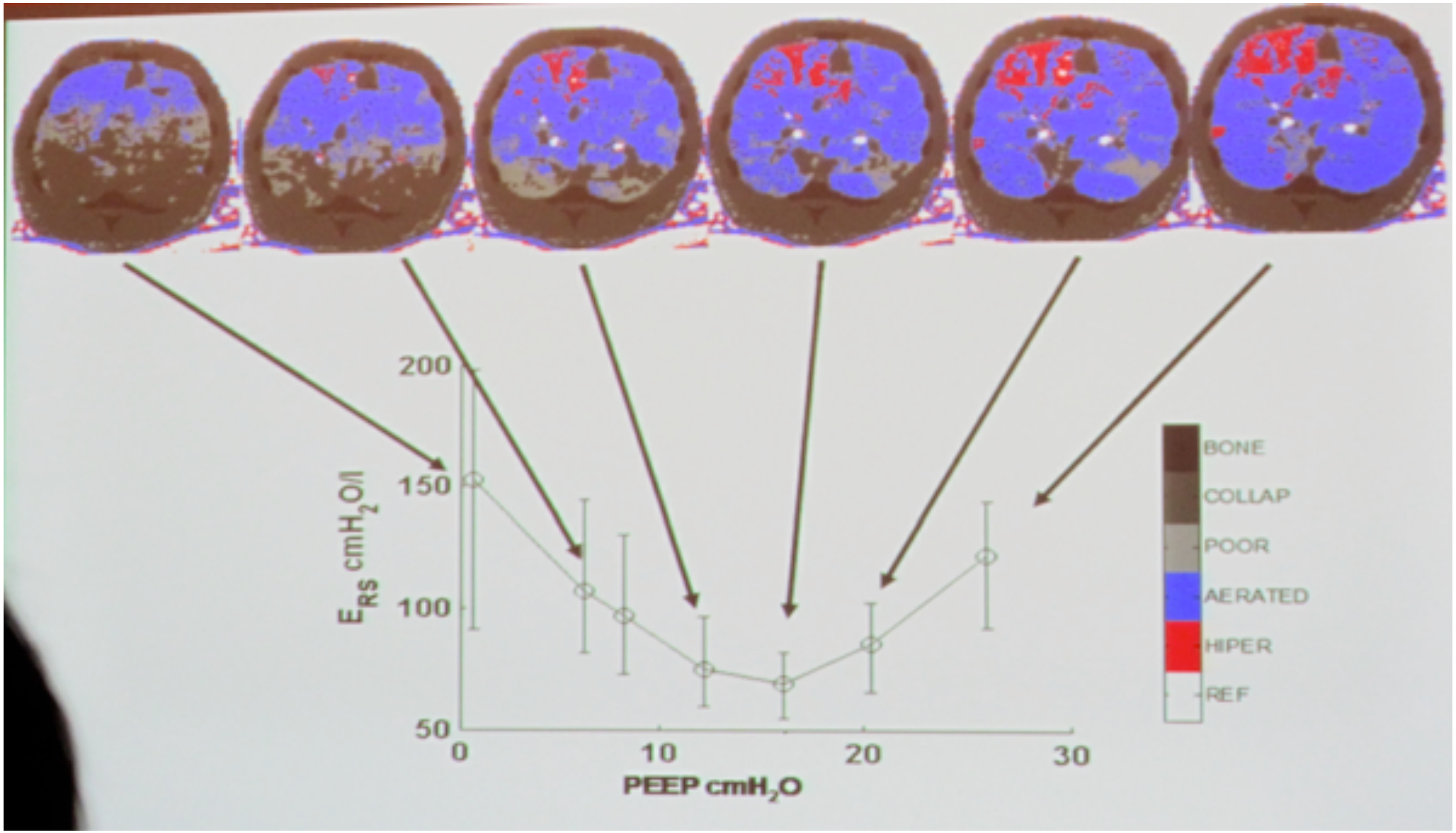
Recruitment manoeuvre and PEEP



Recruitment manoeuvre and PEEP

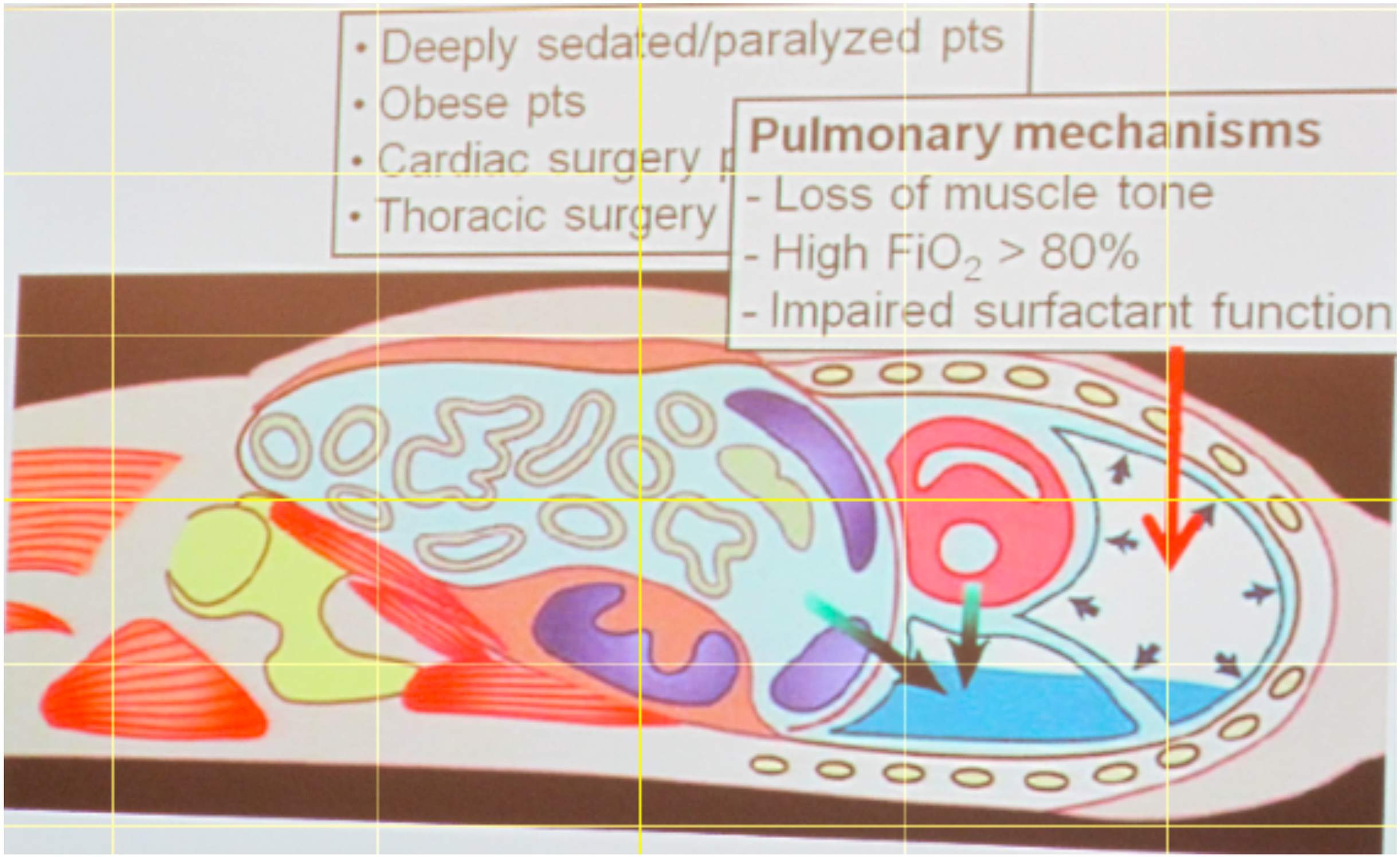


Use compliance to titrate PEEP in ARDS



Carvalho AR et al. Intensive care medicine 2008 Dec; 34(12):2291-9

De-recruited lung

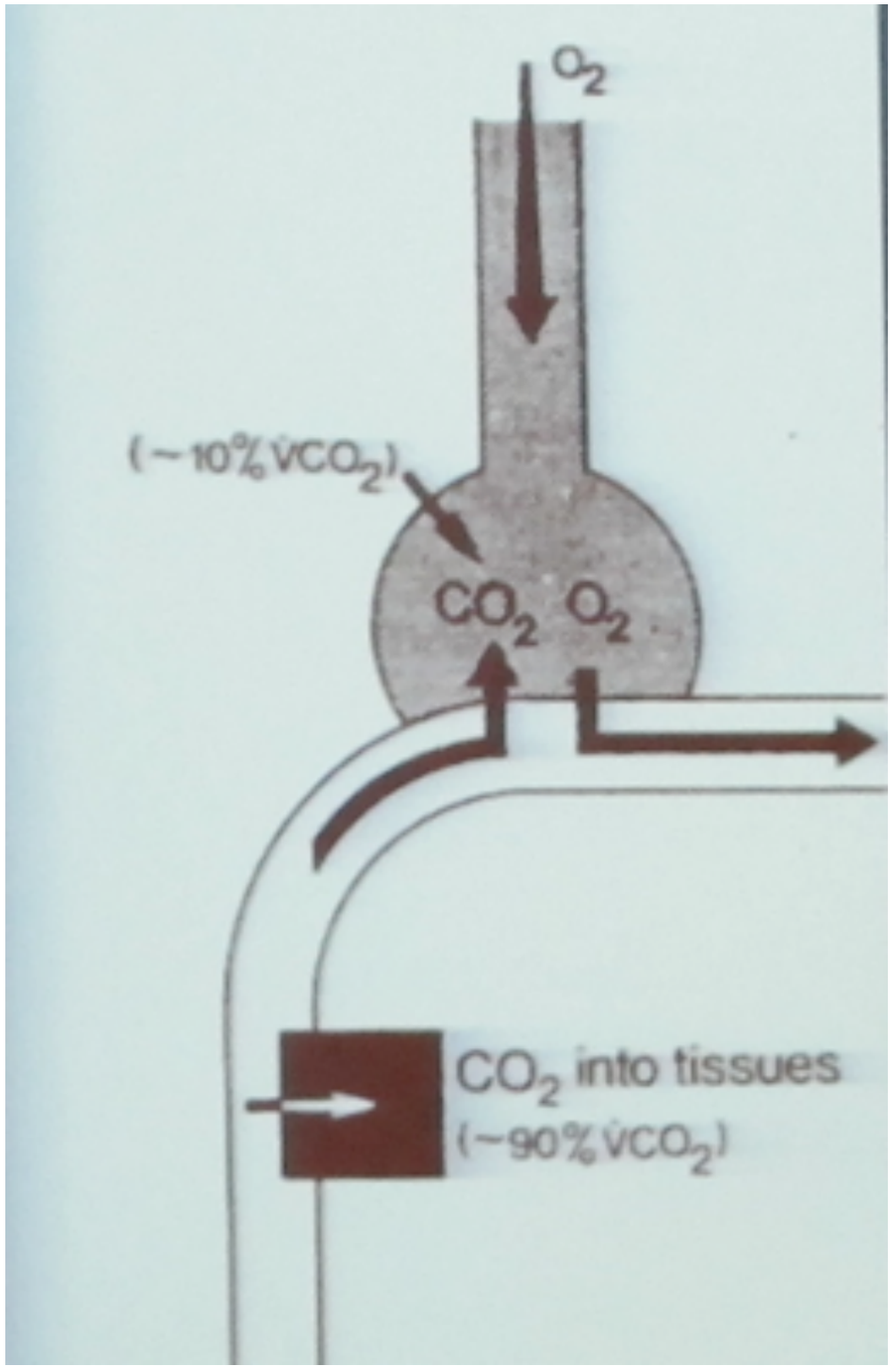


Duggan and Kavanagh Anesthesiology 2005, 102: 838-854

How does APRV work?

1. **Oxygenation** by **diffusion** into open alveoli

2. **CO2** clearance by **ventilation**



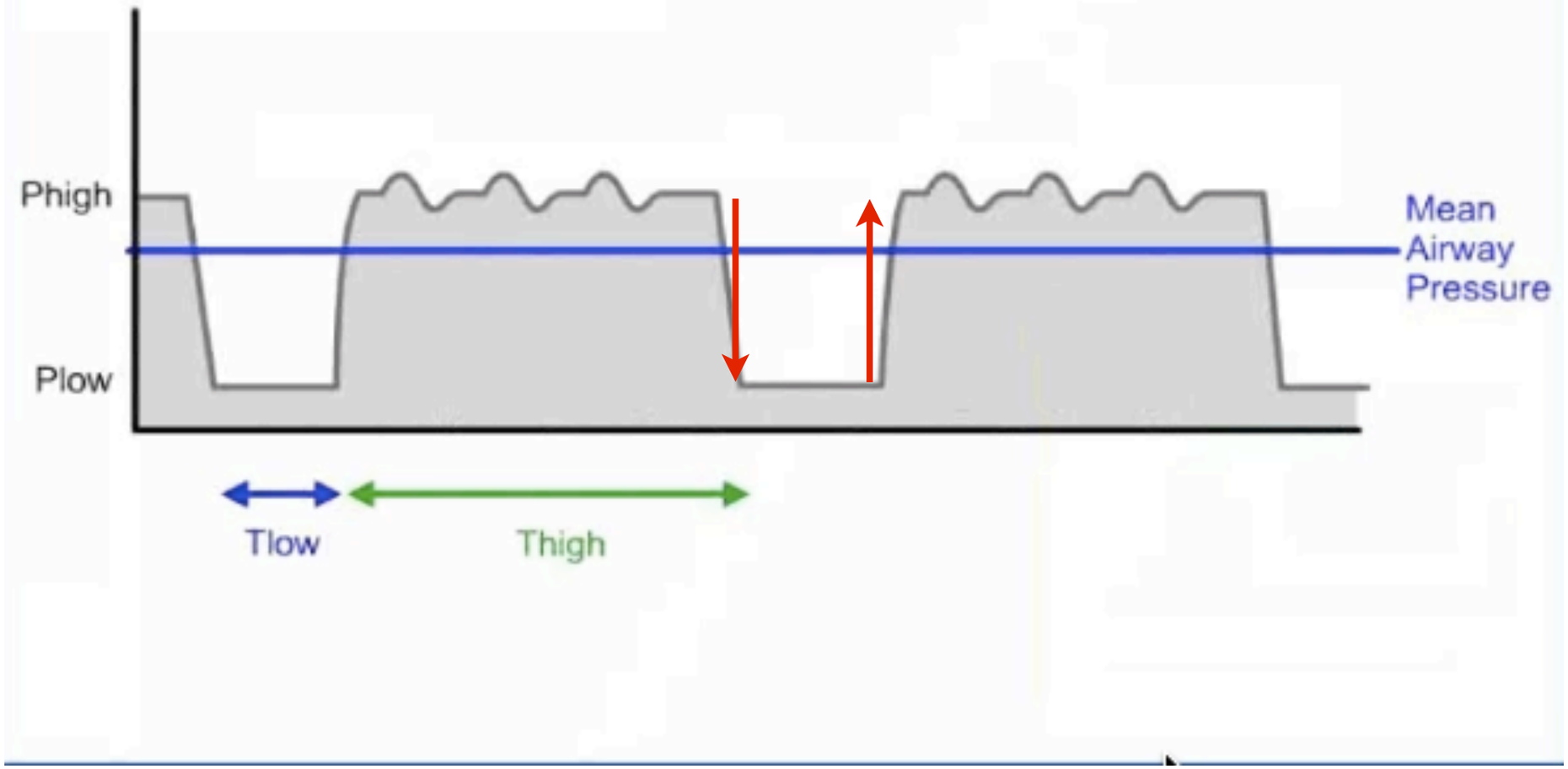
How does apnoeic oxygenation work?

Release phase

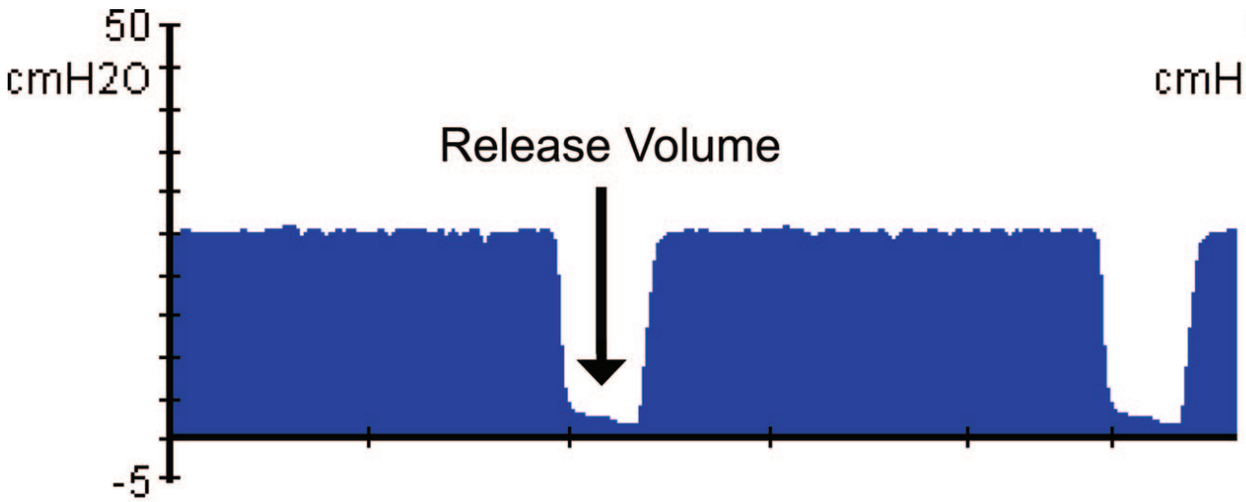
- Release phase is for **CO2 clearance**
- Release volume is NOT tidal volume
- Will be dictated by the pressure differential between

  P High and P low and patient's lung compliance

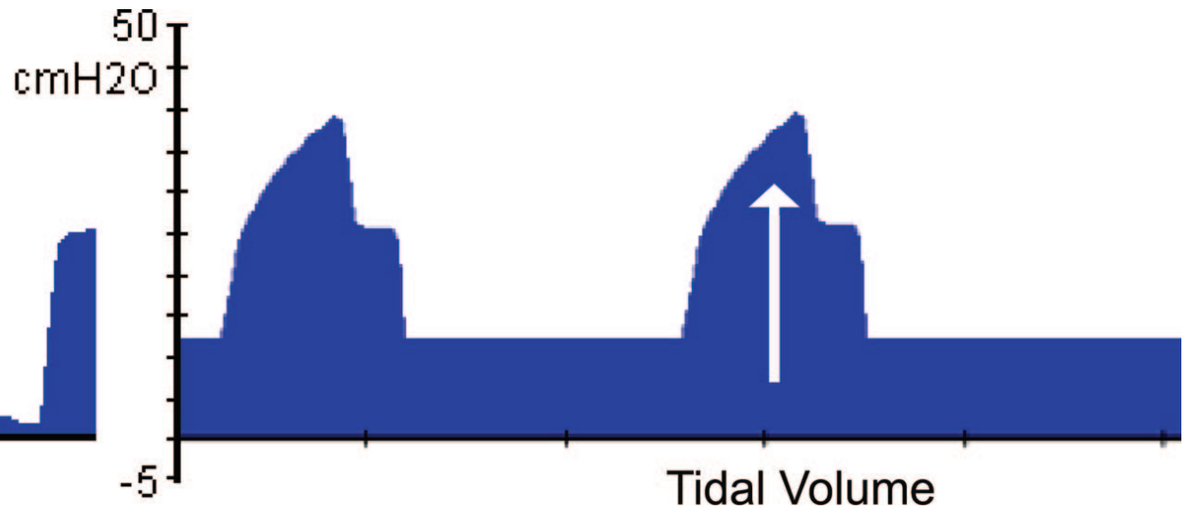
Turning ventilation upside down



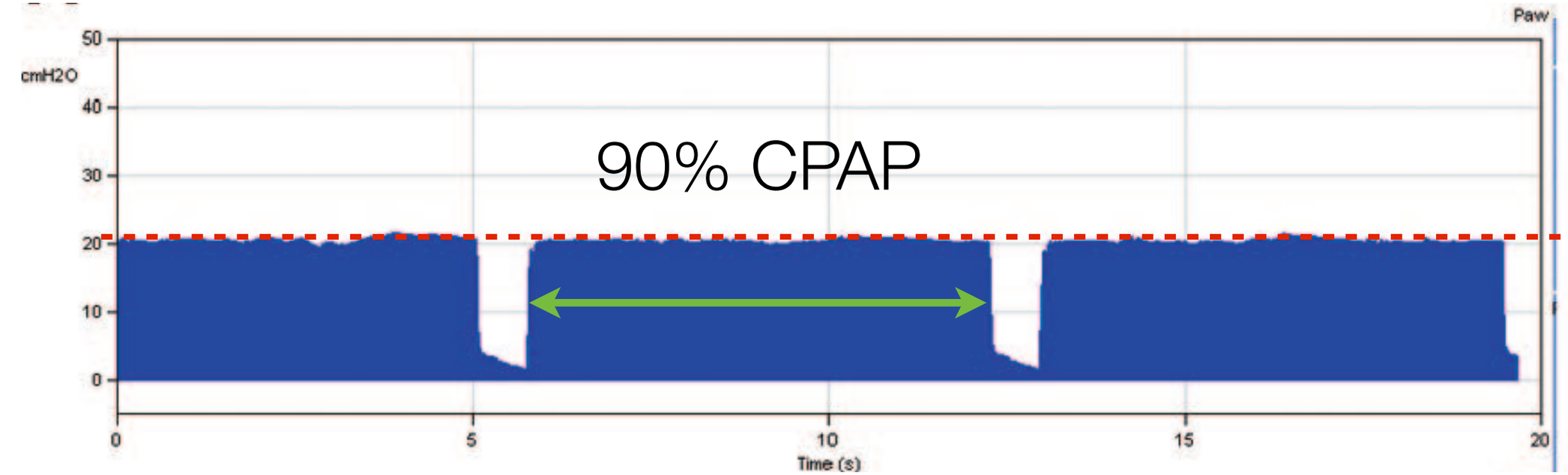
APRV with release ventilation (release of CPAP)
and spontaneous breathing during upper pressure plateau

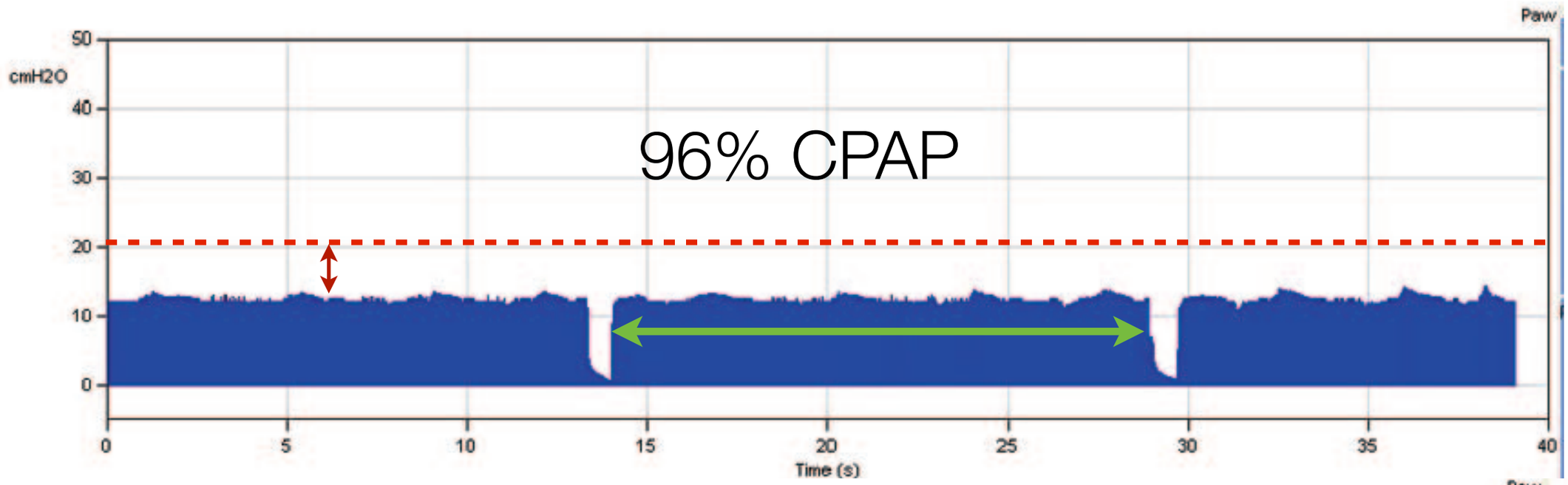


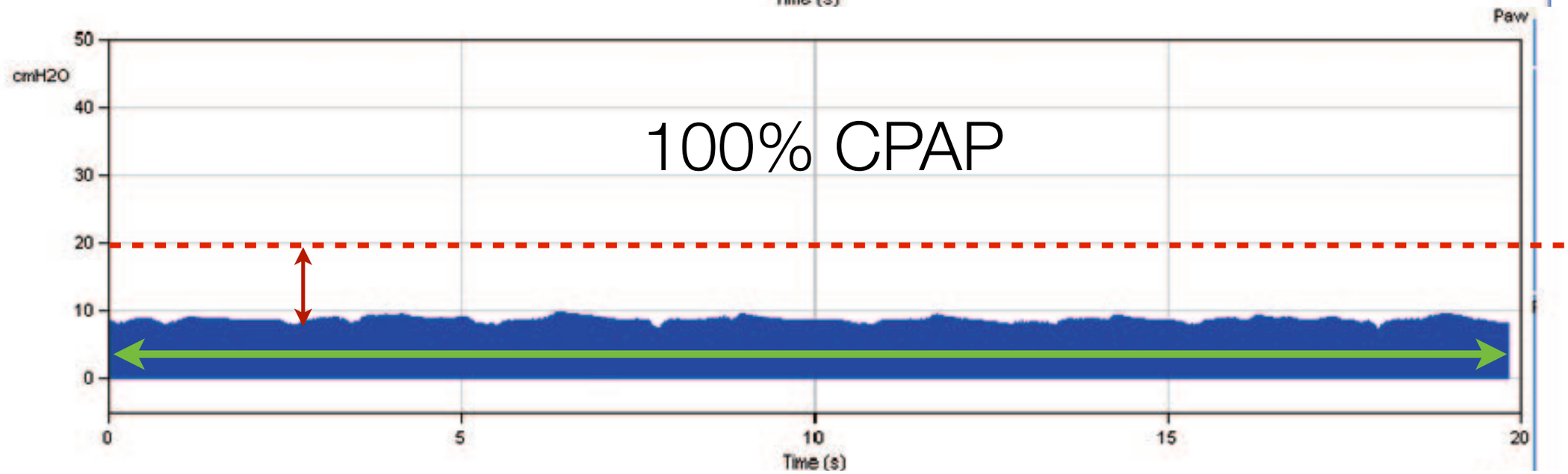
Ventilation during airway pressure release ventilation is augmented by release volumes

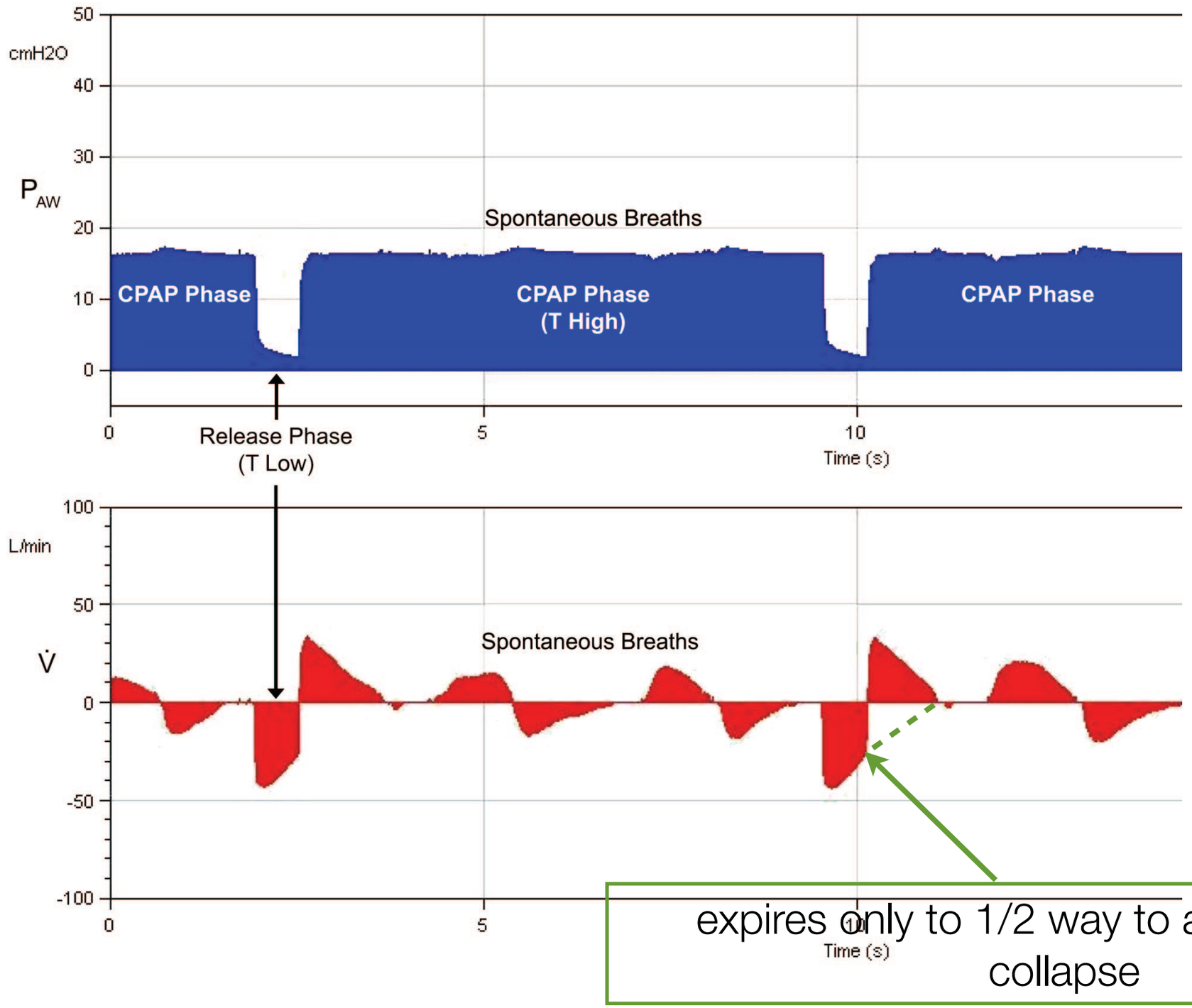


Conversely, tidal volumes during conventional ventilation are generated by increasing airway pressure and lung distension


Paw
cmH2O
50
40
30
20
10
0
90% CPAP
0
5
10
15
20
Time (s)


Paw
cmH2O
50
40
30
20
10
0
96% CPAP
0
5
10
15
20
25
30
35
40
Time (s)


Paw
cmH2O
50
40
30
20
10
0
100% CPAP
0
5
10
15
20
Time (s)


50
cmH2O
40
30
P_{AW}
20
Spontaneous Breaths
10
CPAP Phase
CPAP Phase
(T High)
CPAP Phase
0
0
Release Phase
(T Low)
5
10
Time (s)
100
L/min
50
$\dot{V}$
0
Spontaneous Breaths
-50
-100
0
5
10
Time (s)
expires only to 1/2 way to avoid alveolar collapse

Typical initial settings

- P High - 25 -30 cm H2O
- P Low - 0 - 5 cm H2O
- T High - 4-6 sec
- T Low - 0.4 - 1.0 sec

???

Download at

http://www.jvsmedicscorner.com