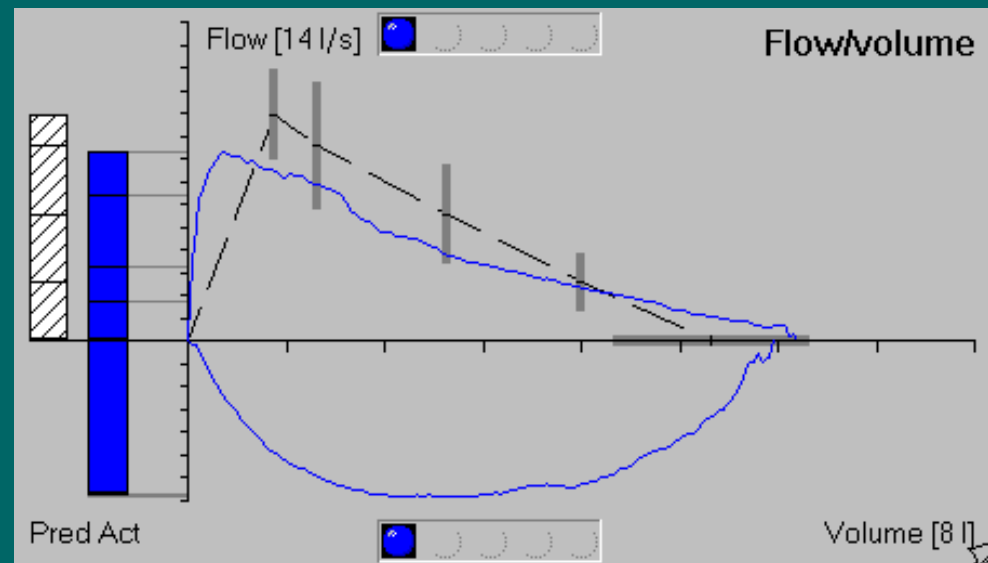
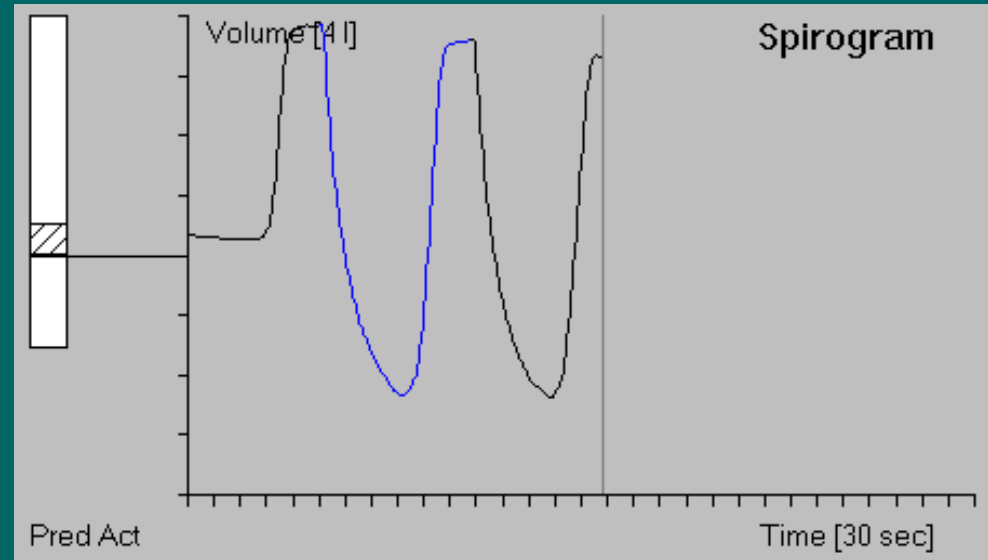
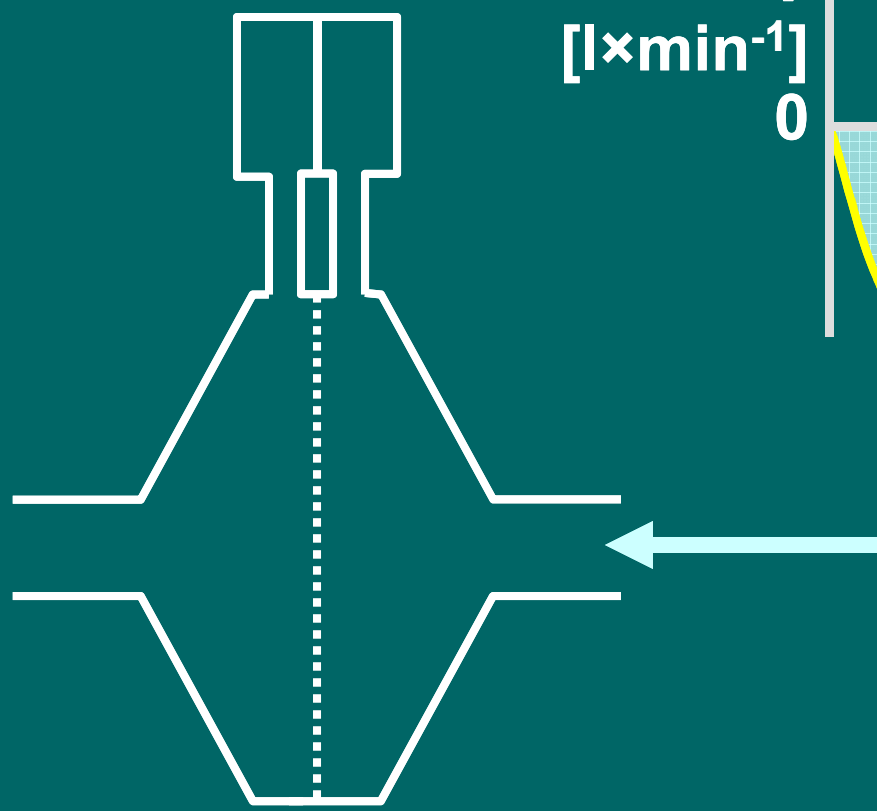


Lung function testing

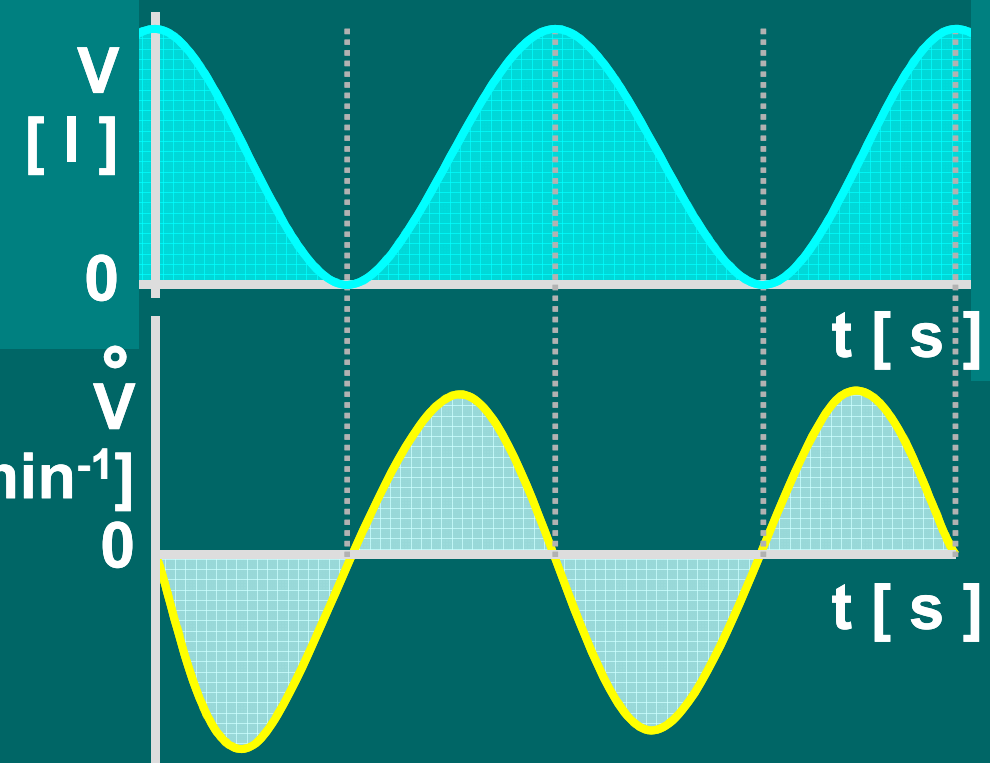
Robert Vyšehradský

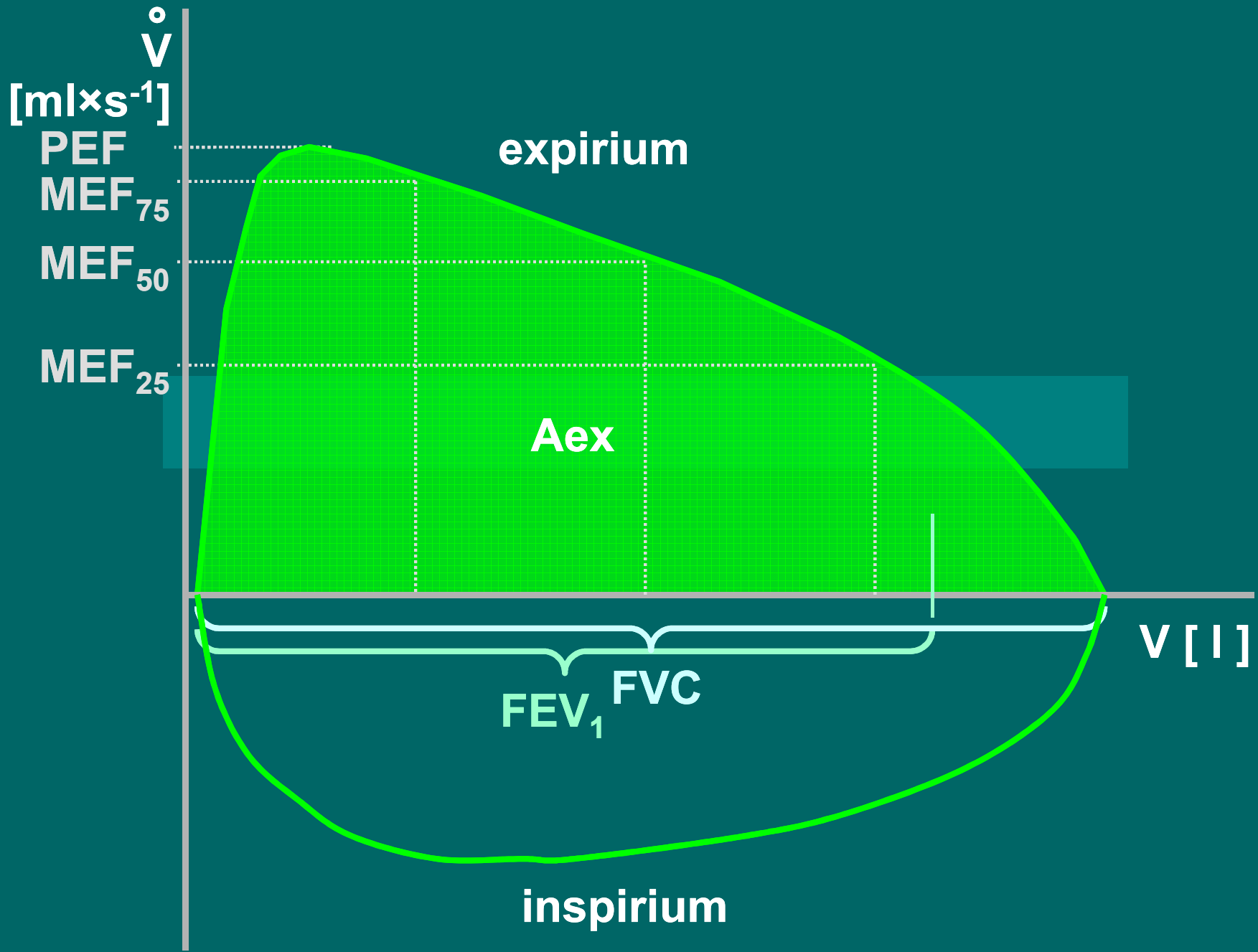
Clinic of Pneumology and Phthisiology
Comenius University, Jessenius Faculty of Medicine

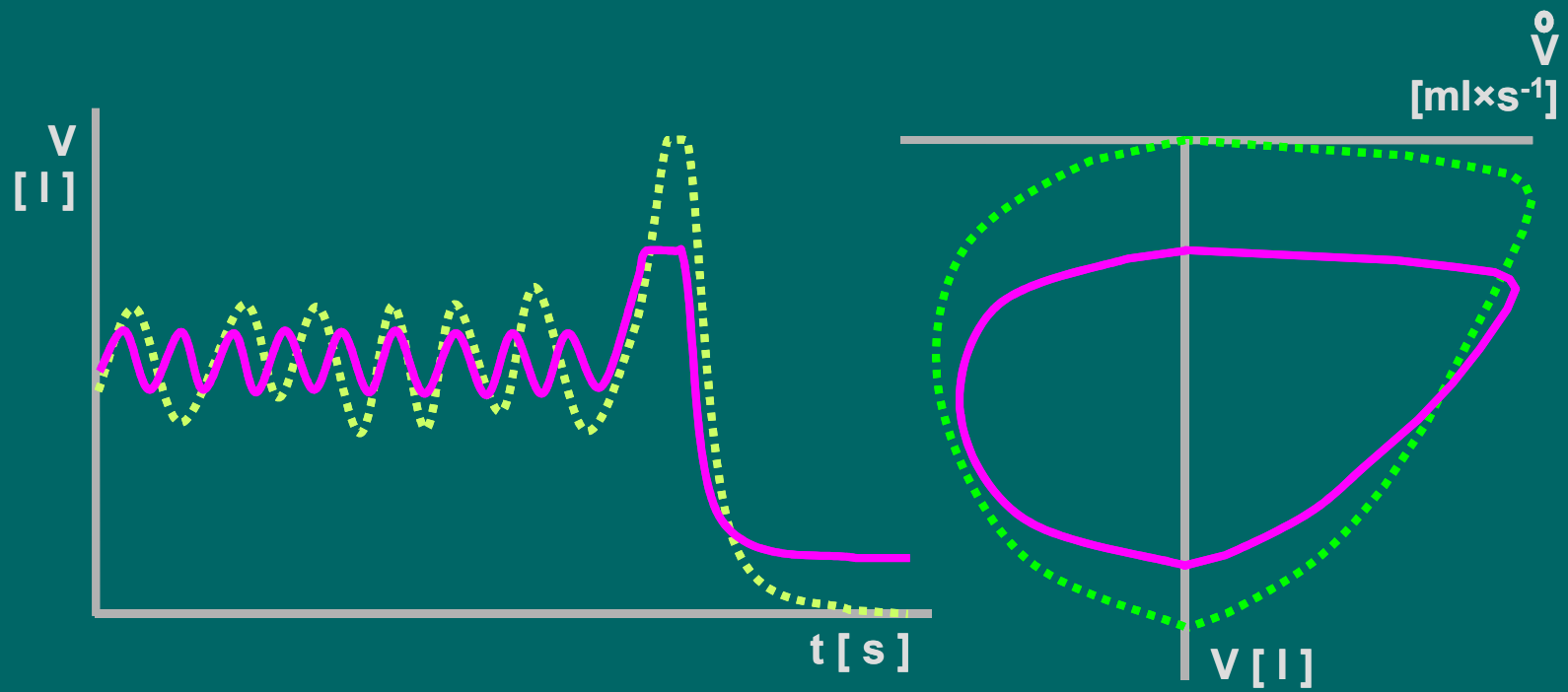


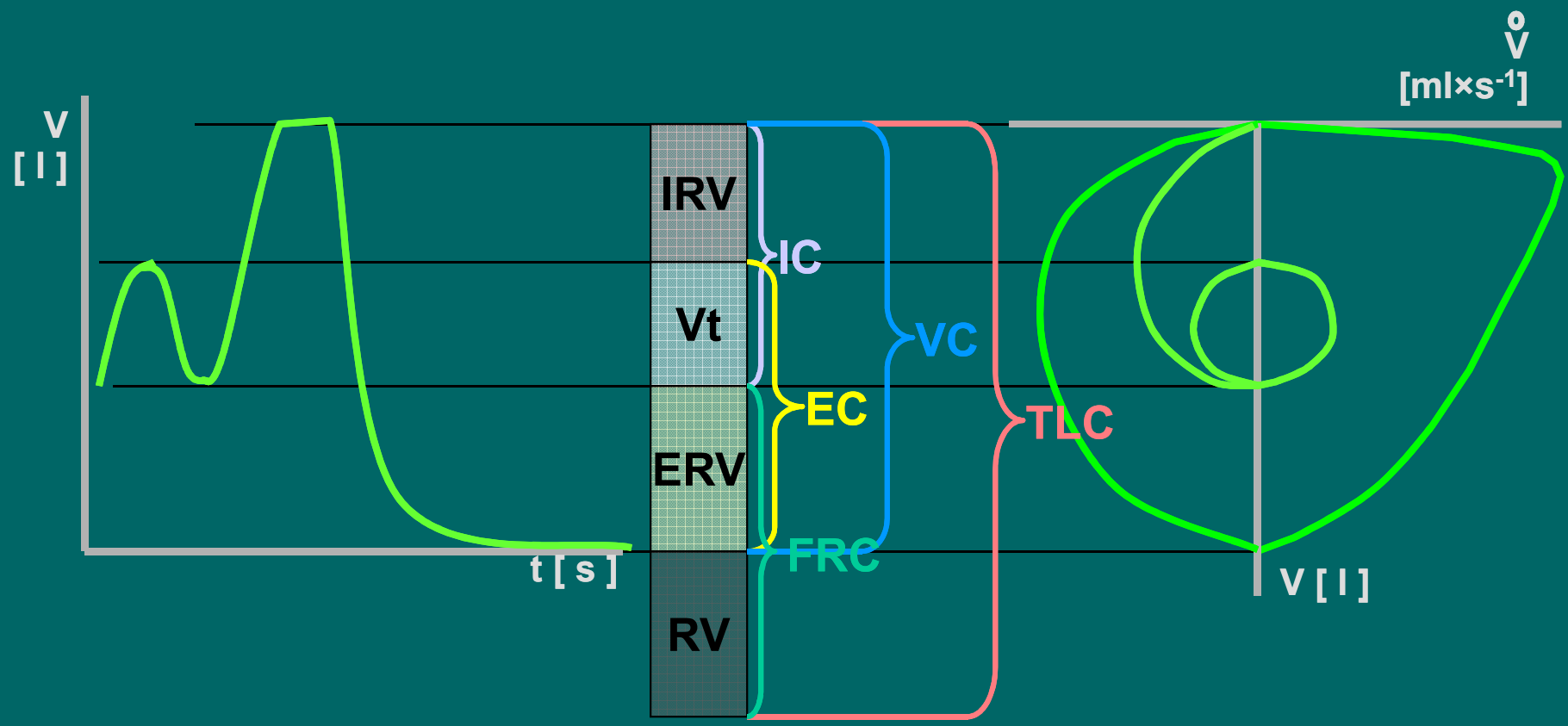


$[l \times \text{min}^{-1}]$

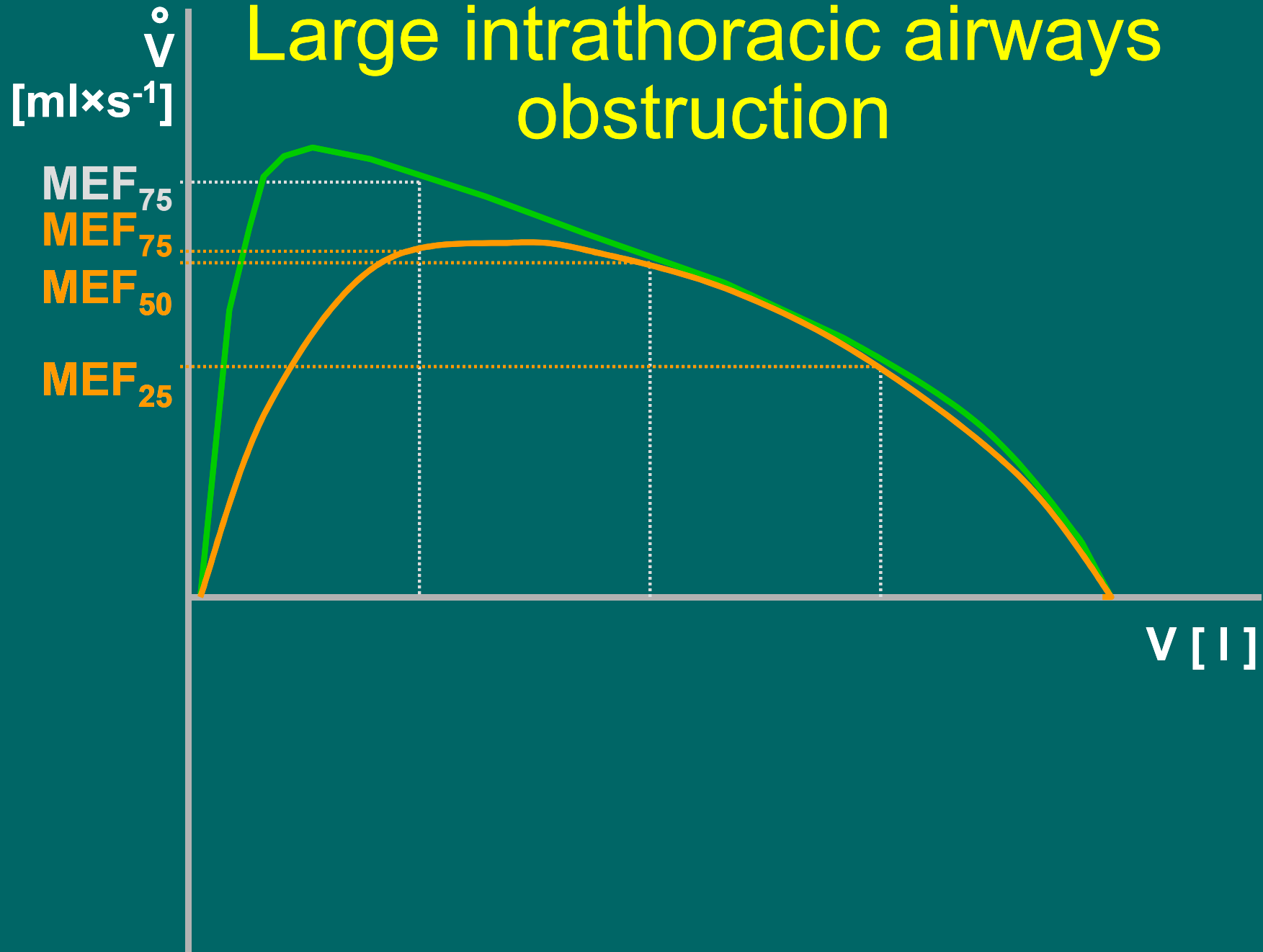




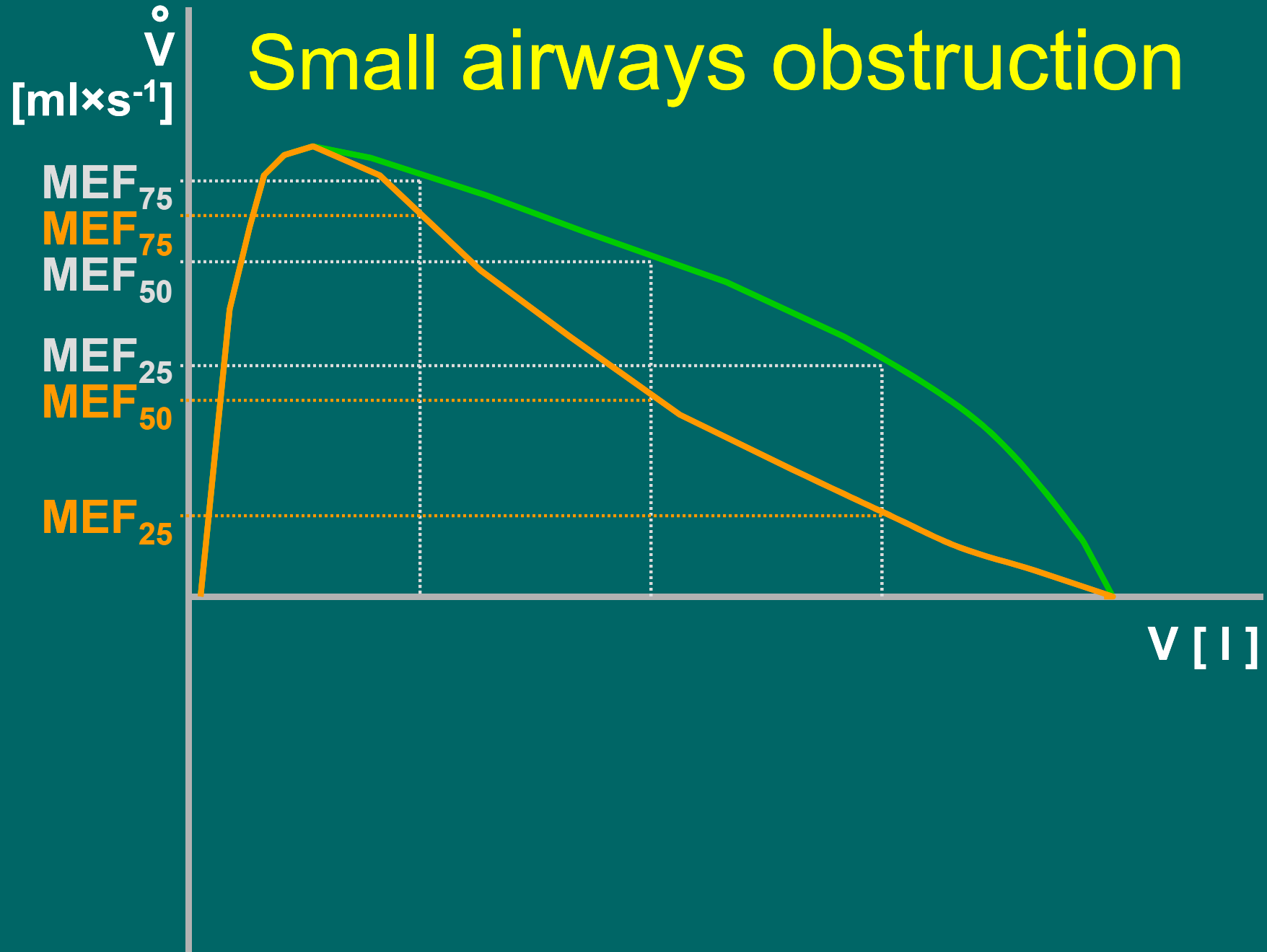




Large intrathoracic airways obstruction

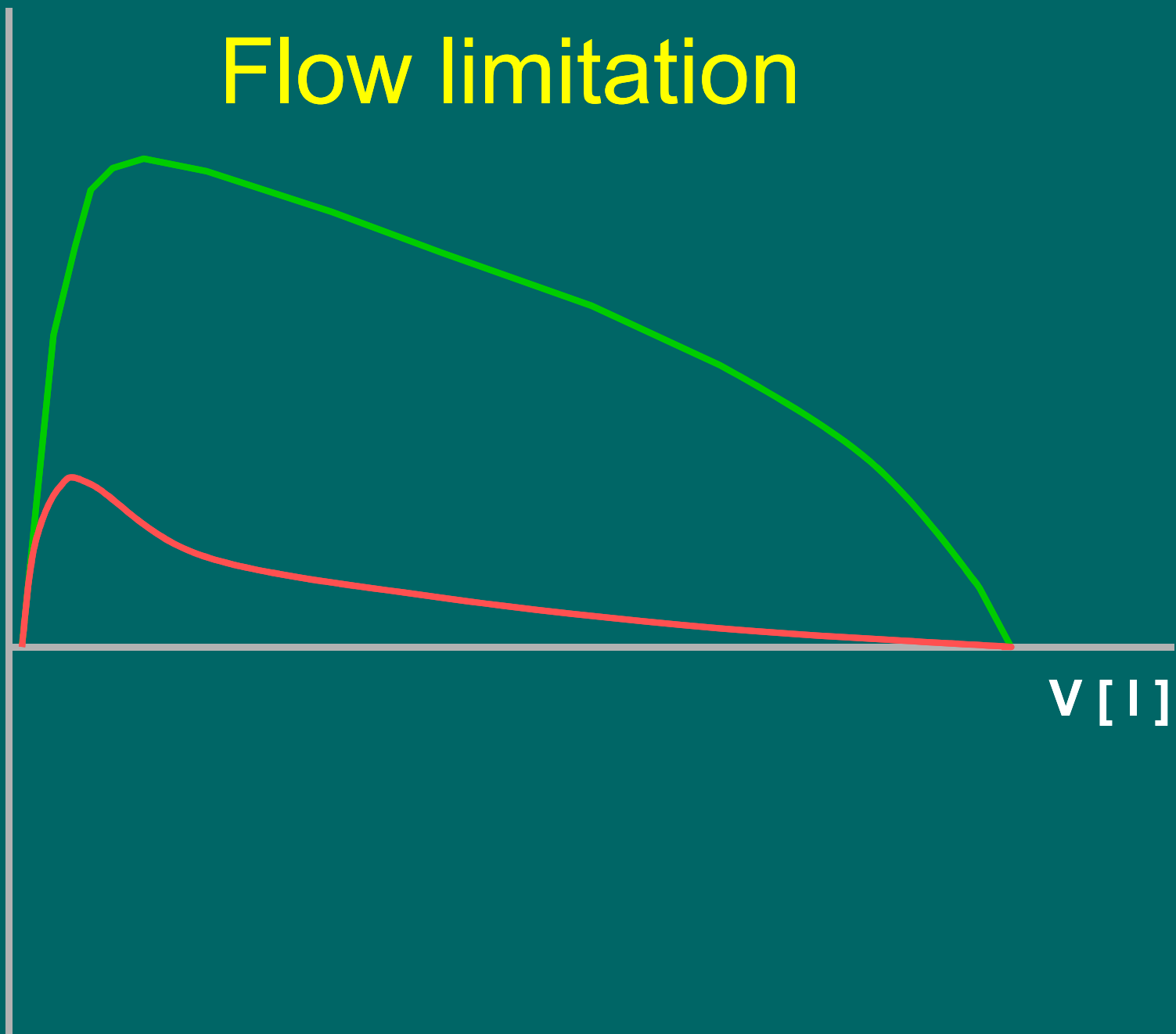


Small airways obstruction



Flow limitation

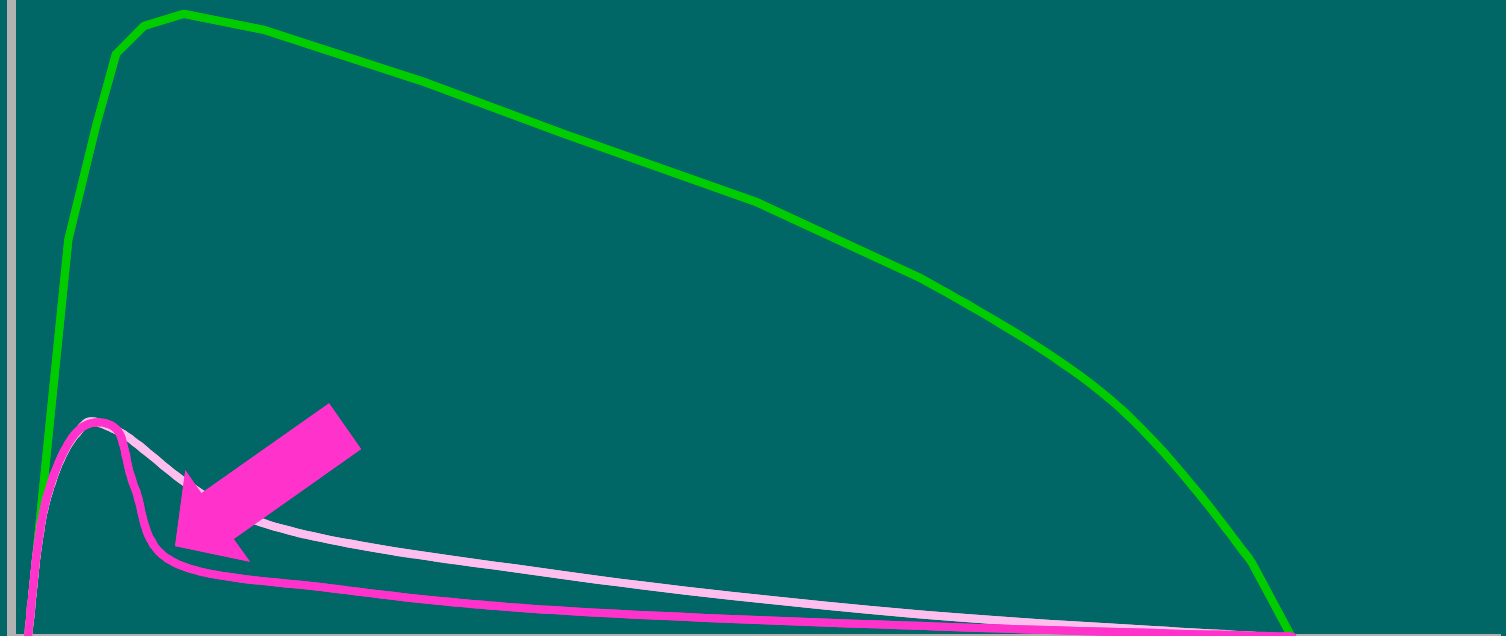
\dot{V}
[ml \times s $^{-1}$]



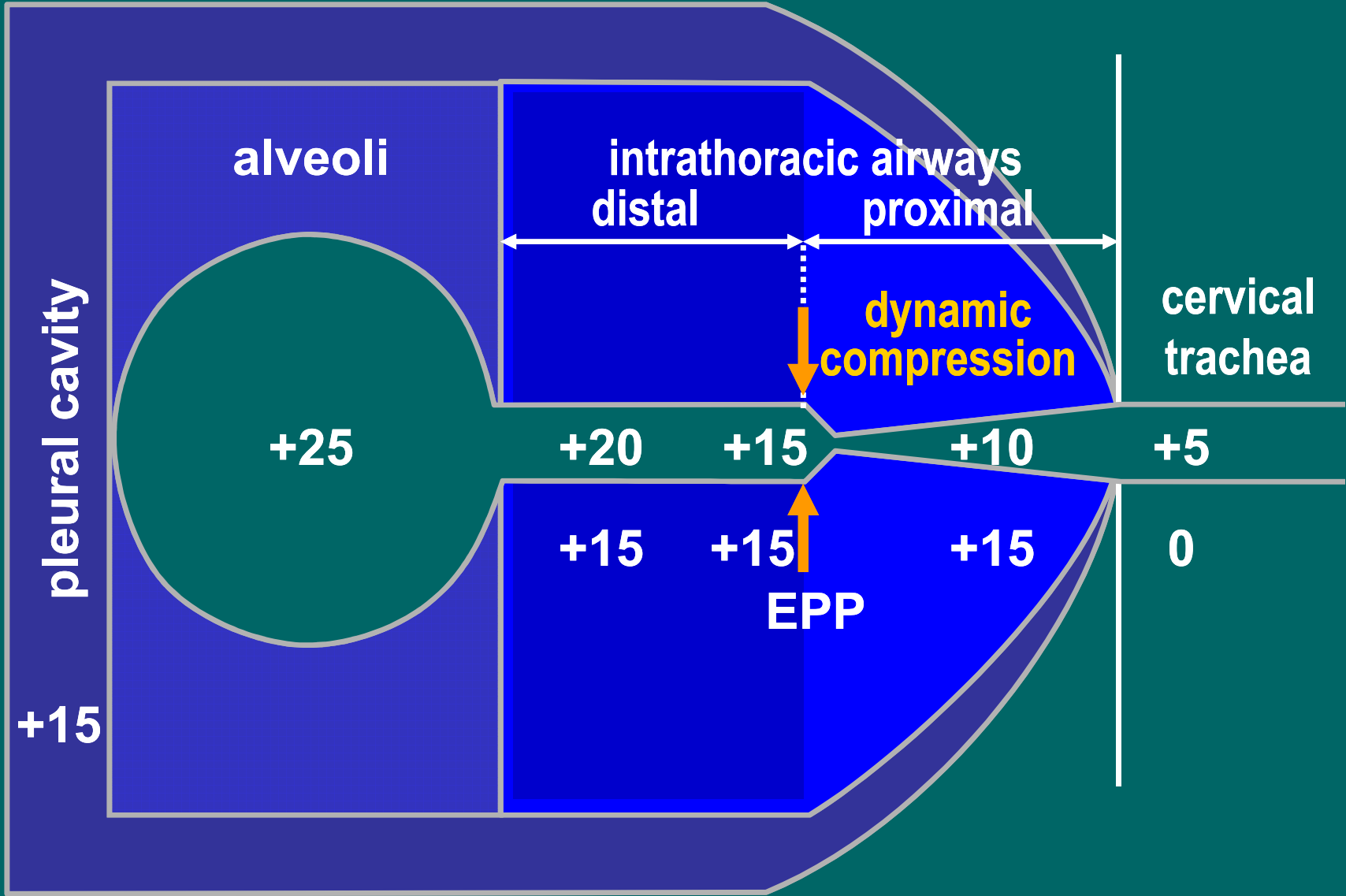
V [l]

Sign of hyperinflation

\dot{V}
[ml \times s $^{-1}$]

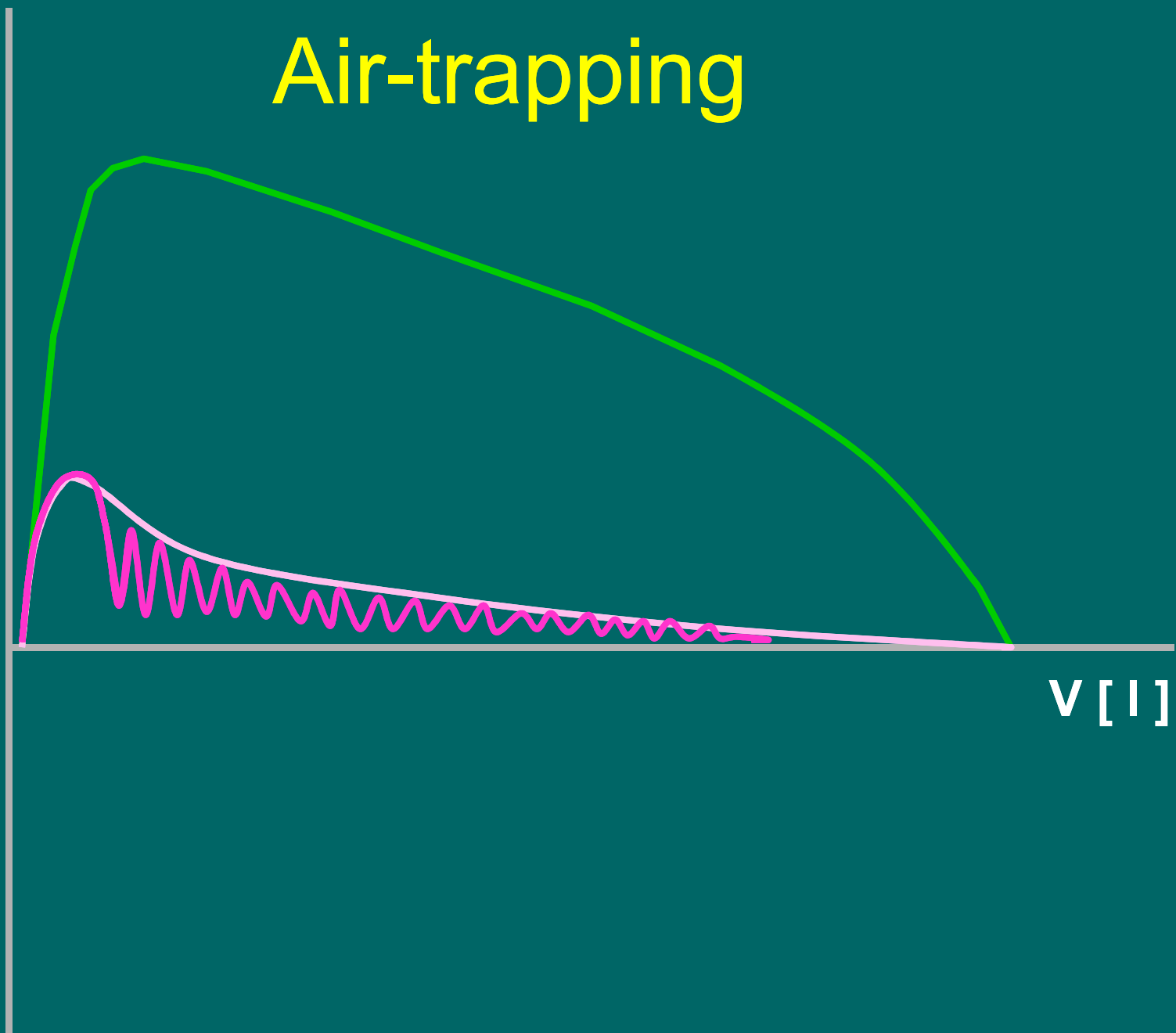


V [l]



Air-trapping

\dot{V}
[ml \times s $^{-1}$]



V [l]

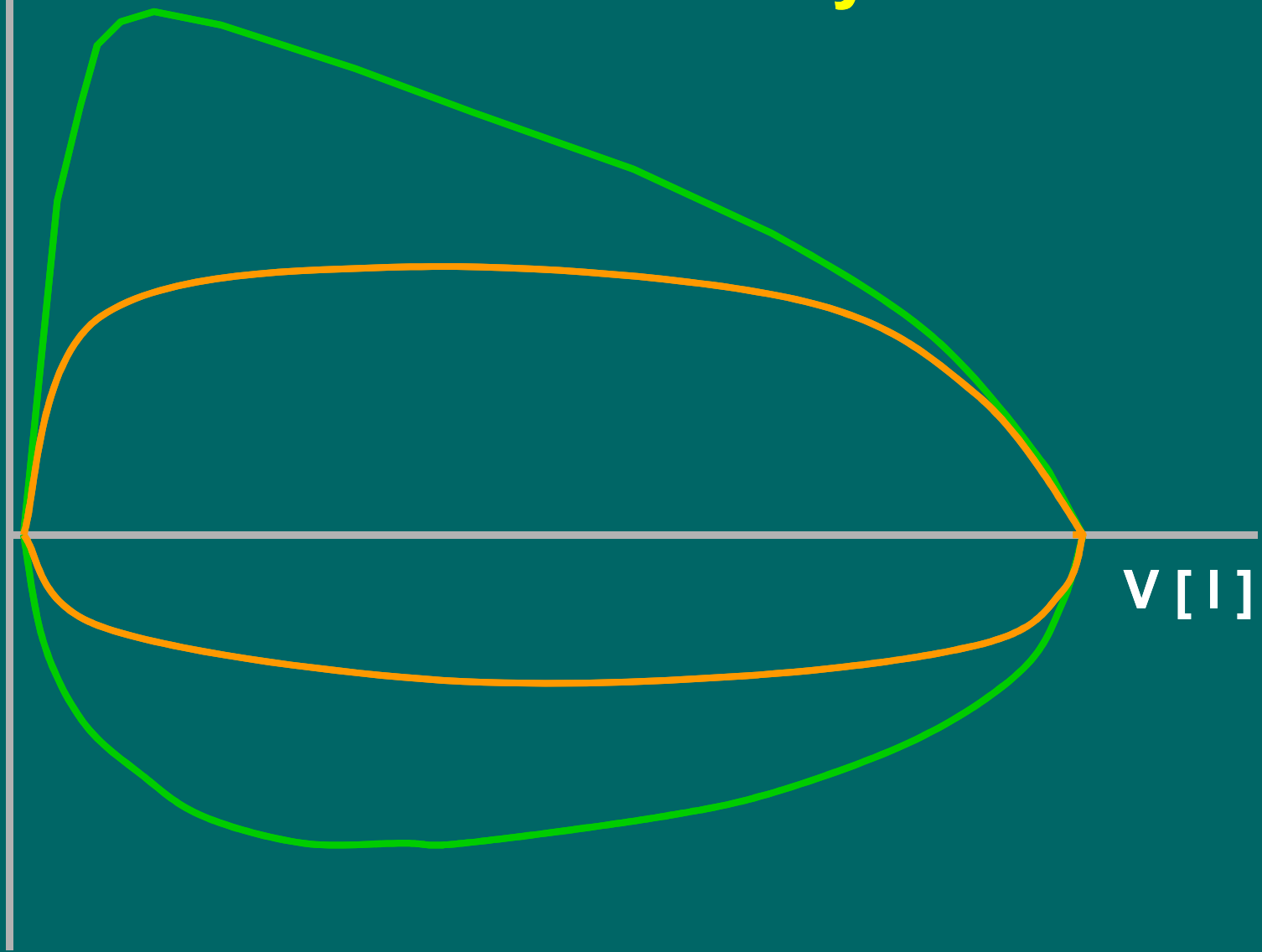
\dot{v}
[ml \times s $^{-1}$]

Variable obstruction of extrathoracic airways



Fixed obstruction of extrathoracic airways

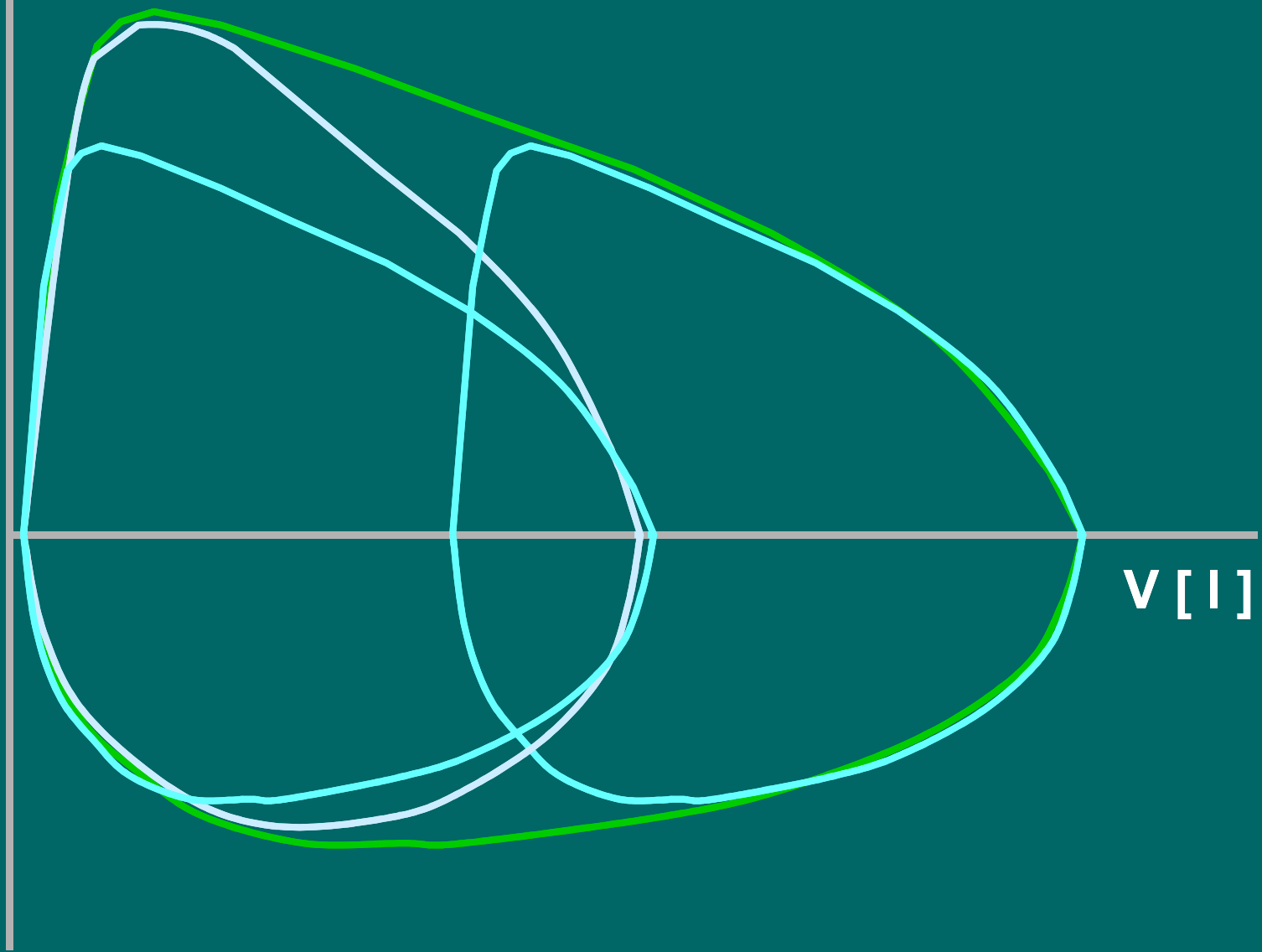
\dot{V}
[ml \times s $^{-1}$]



V [l]

\dot{V}
[ml \times s $^{-1}$]

Restriction

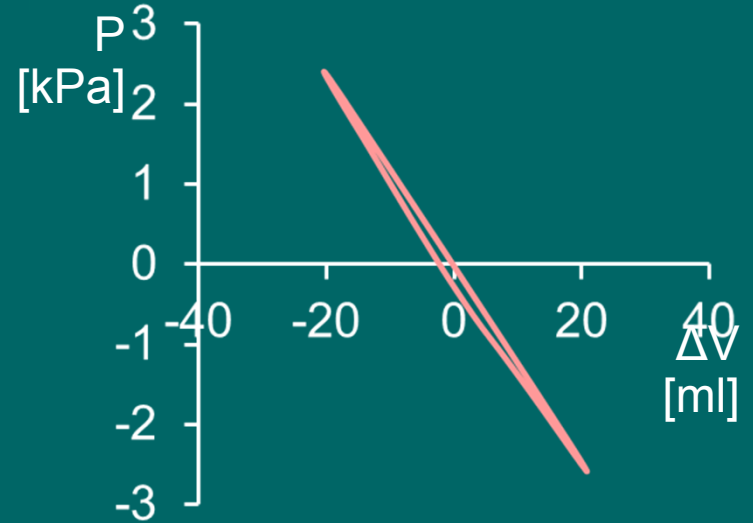
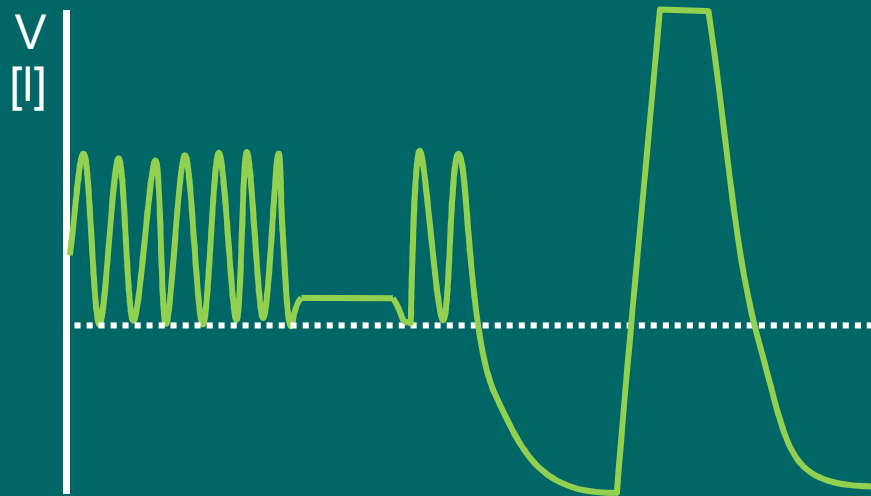
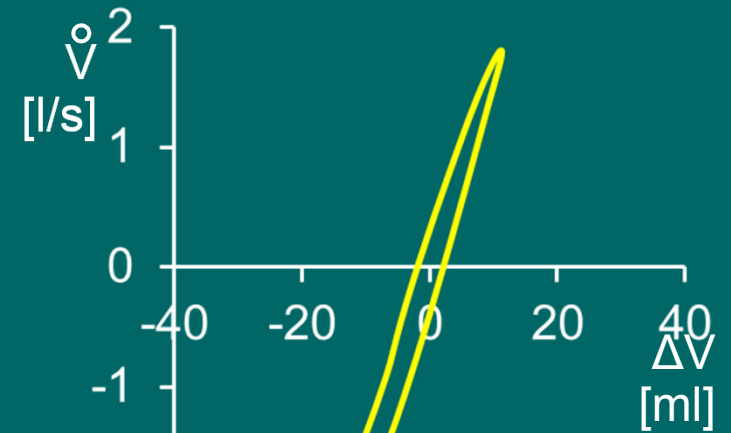
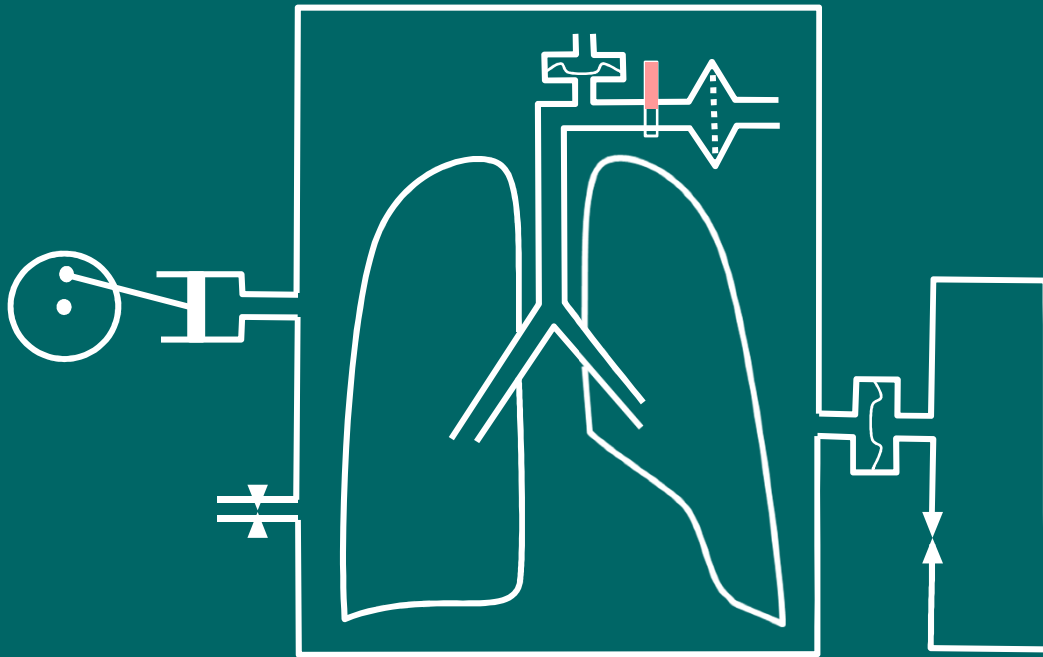


V [I]

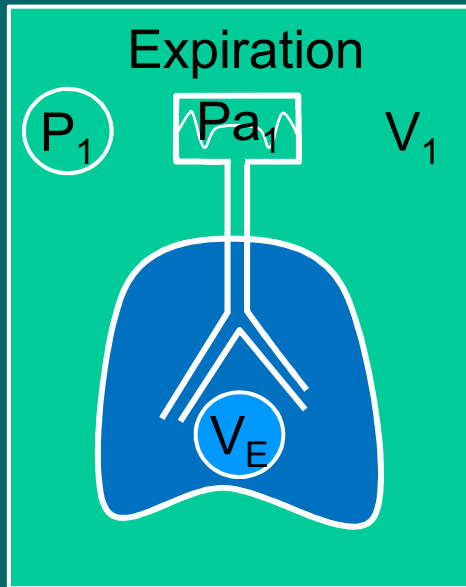
Resistance of airways, RV, TLC



Resistance of airways, RV, TLC



Measurement principle: TGV, sRaw



$$P_1 \times V_1 = P_2 \times V_2$$

$$V_2 = P_1 \times V_1 / P_2$$

V_2 – box volume

$$V_1 - V_2 = \Delta V = V_I - V_E$$

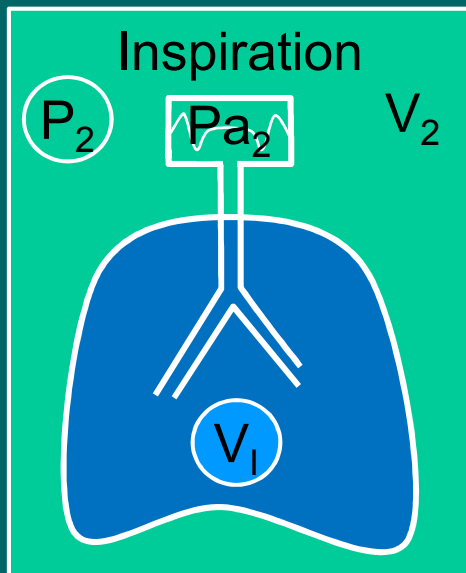
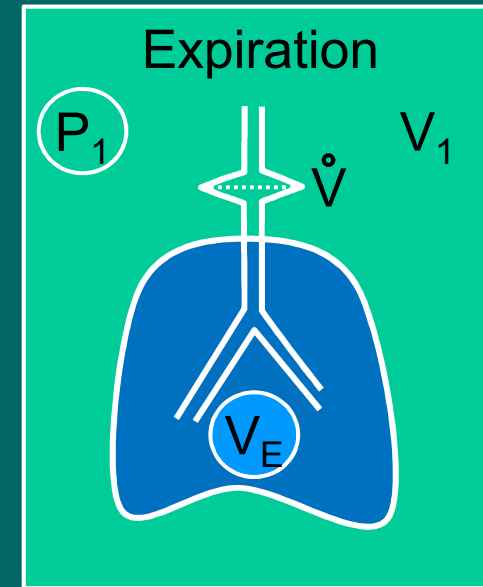
$$TGV \times P_{a1} = (TGV + \Delta V) \times P_{a2}$$

$$TGV \times P_{a1} = TGV \times P_{a2} + \Delta V \times P_{a2}$$

$$TGV \times P_{a1} - TGV \times P_{a2} = \Delta V \times P_{a2}$$

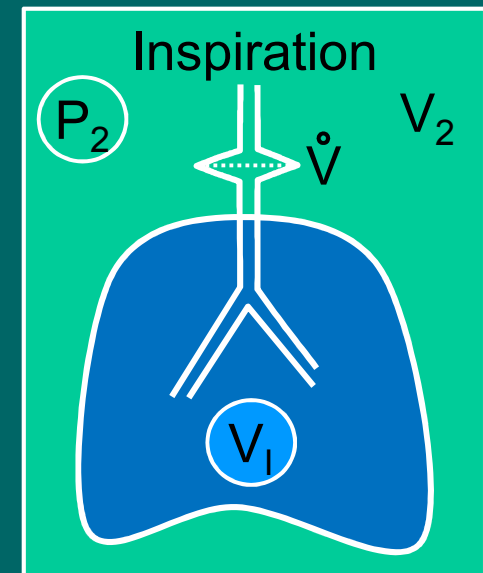
$$TGV \times (P_{a1} - P_{a2}) = \Delta V \times P_{a2}$$

$$TGV = \Delta V \times P_{a2} / (P_{a1} - P_{a2})$$

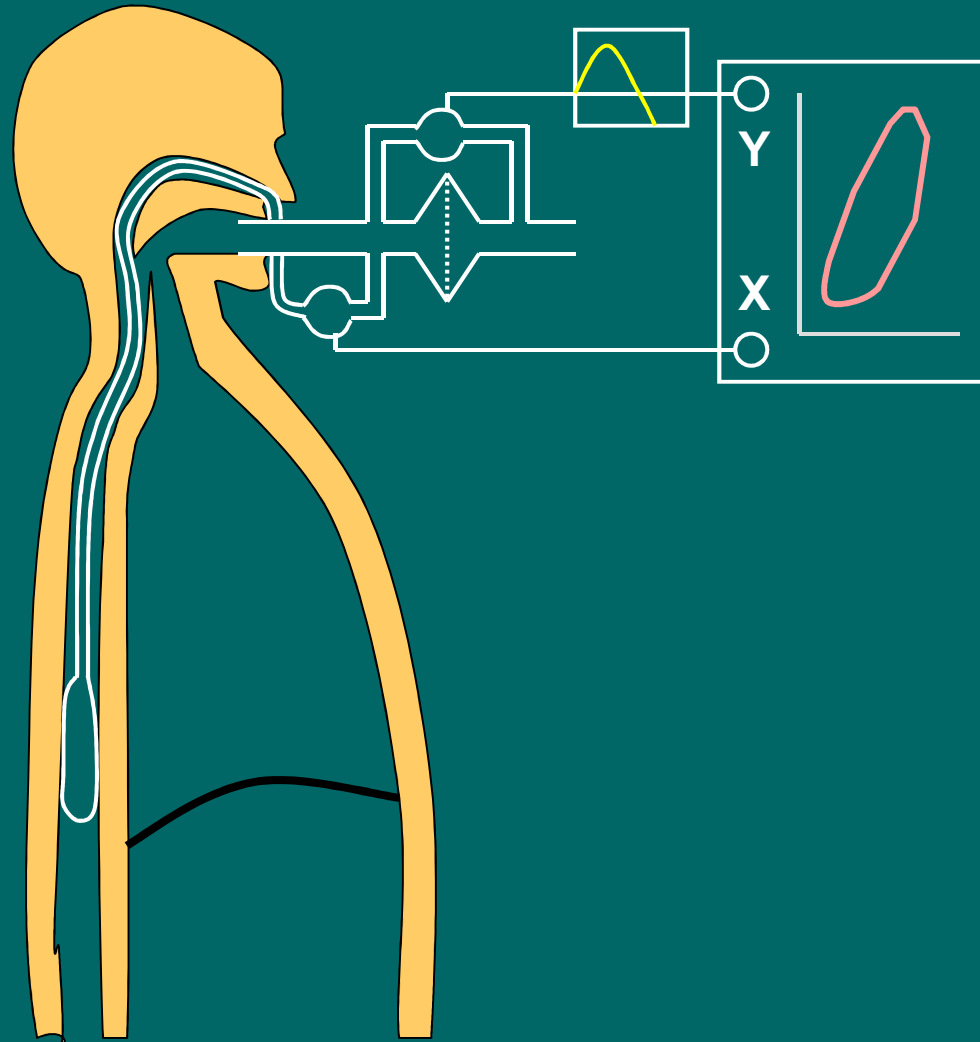


$$V_1 - V_2 = \Delta V = V_I - V_E$$

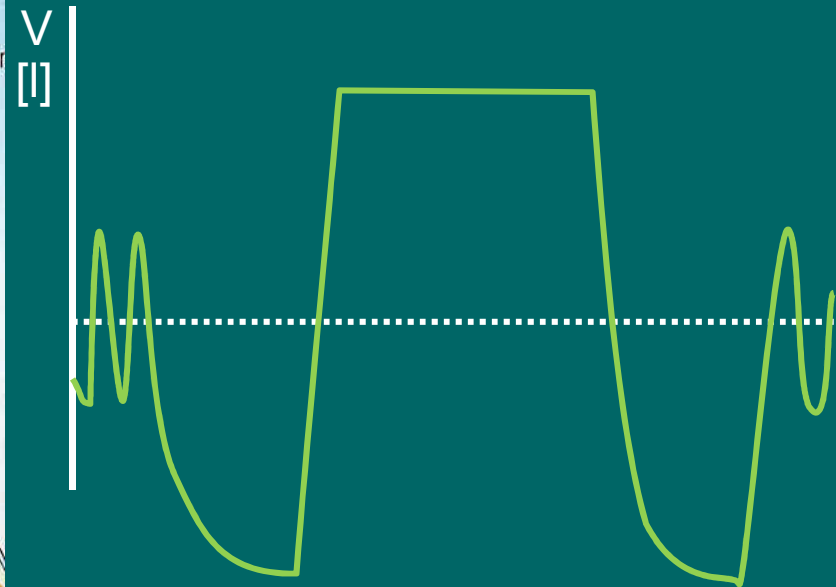
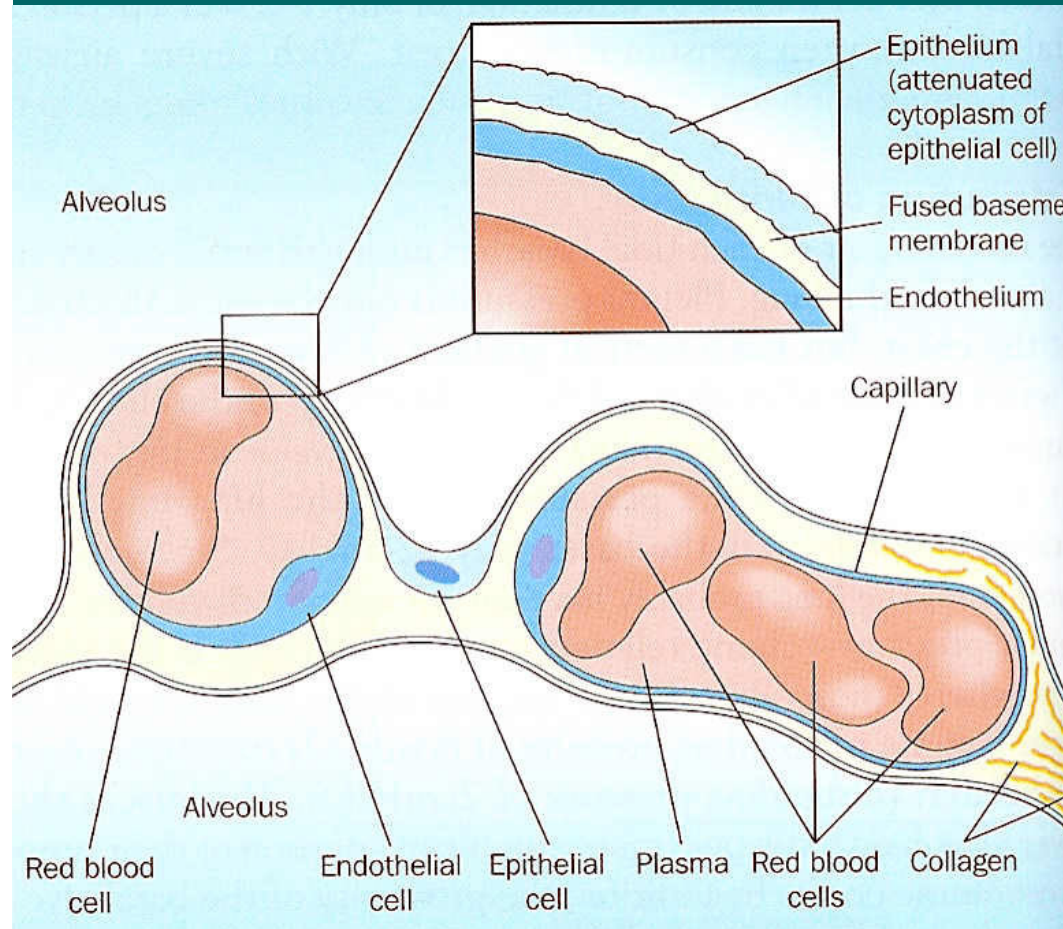
$$sR_{aw} = \Delta V / V \times P$$



Lung compliance



Lung diffusion capacity



Ergospirometry

