

Ventilator Pocket Guide

Foundational Equations

Ohm's Law	$\Delta P = FR = P_{aw} - P_{alv} = P_{pl} - PEEP_{total}$
Equation of Motion	$P_{aw} = FR + \frac{V_t}{C} + PEEP_{total}$
Compliance	$C = \frac{\Delta V}{\Delta P}$
Natural Decay Equation	$V_i(t) = \frac{V_o}{e^{\frac{t}{RC}}} = \frac{V_o}{e^{\frac{t}{\tau}}}$
Calculating τ, General Case	$\tau = \frac{V_t}{F} \cdot \text{Bigg}(\frac{PIP - P_{plt}}{P_{plt} - PEEP_{total}} \text{Bigg)}$
Calculating τ, Special Case*	$\tau = -\frac{V_t}{F}$

*Assumes (1) no autoPEEP and (2) patient is passive.

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