# Mechanical Ventilator Waveform Analysis

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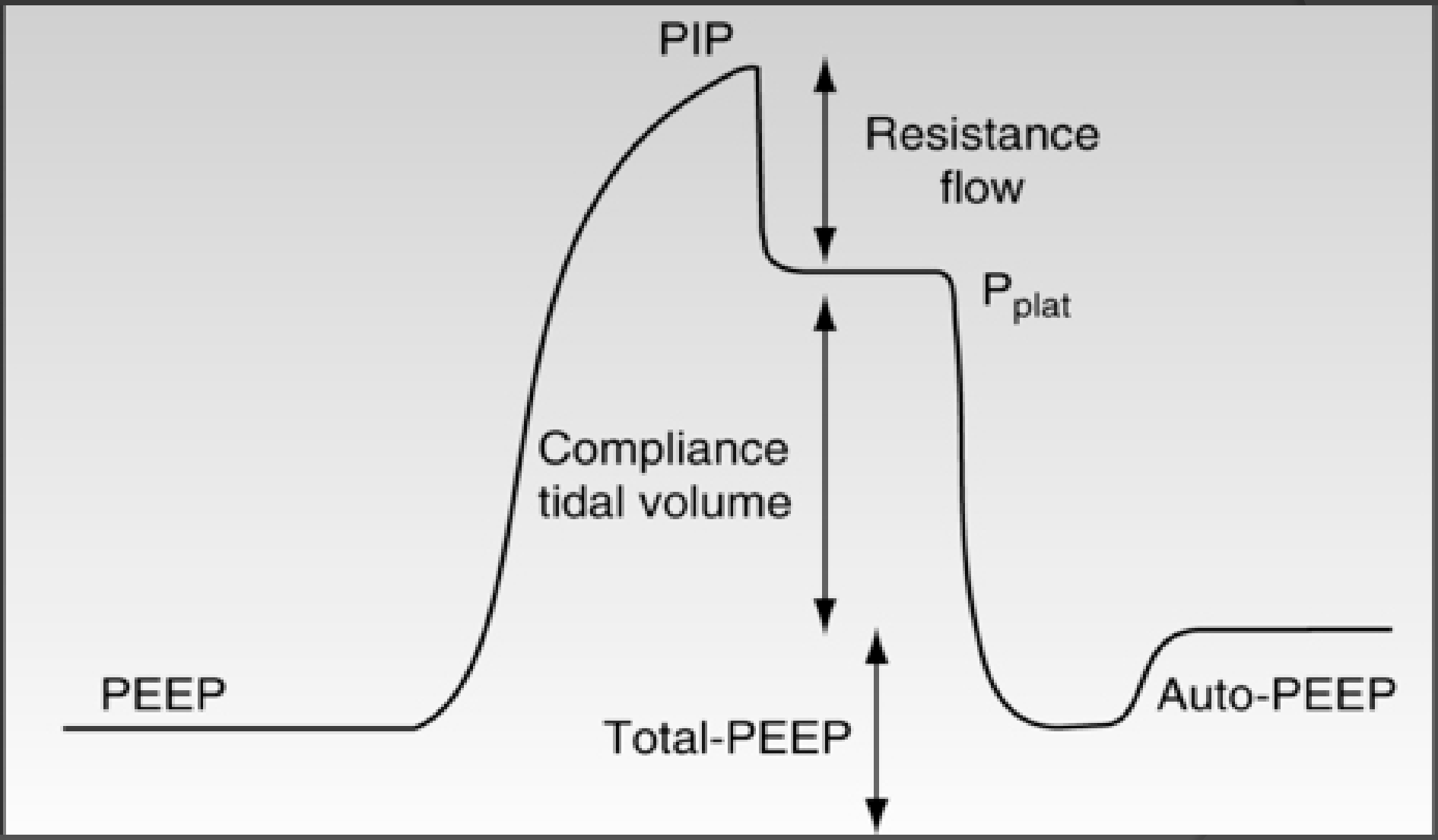
# Objectives

- Identify early changes in patient pathophysiology
- Recognize changes in compliance
- Recognize changes in resistance


MEANWHILE AT WAVEFORM CLASS...
NOW WHAT DO YOU SEE WITH THE FOLLOWING FLOW VOLUME LOOP?
A DUCK!
A HORSIE!
NO A DOGGIE!
SIGH
MY MOM-IN-LAW BENDING OVER!

# The Pressure Graph....

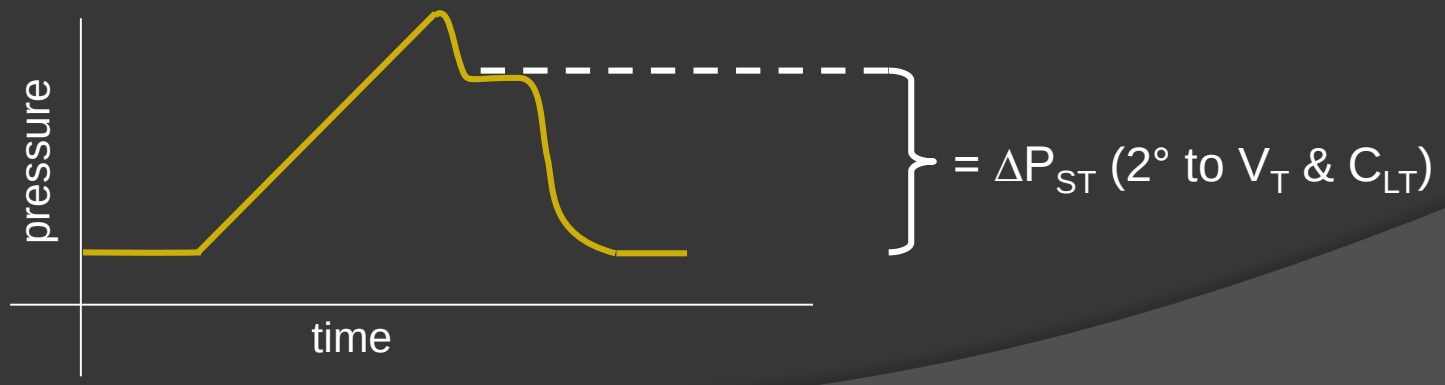


Any difference between $P_{PLATEAU}$ and PEEP is due to the volume of gas forced into the lung ($V_T$) and the lung compliance ($C_{LT}$)

$$P_{PLATEAU} - PEEP = P_{STATIC} \quad \text{(Ventilating Pressure)}$$

Since $C_{LT} = \frac{\Delta V}{\Delta P}$, then this formula can be rewritten so that:

$$C_{LT} = \frac{V_{Te}}{P_{PLATEAU} - PEEP}$$

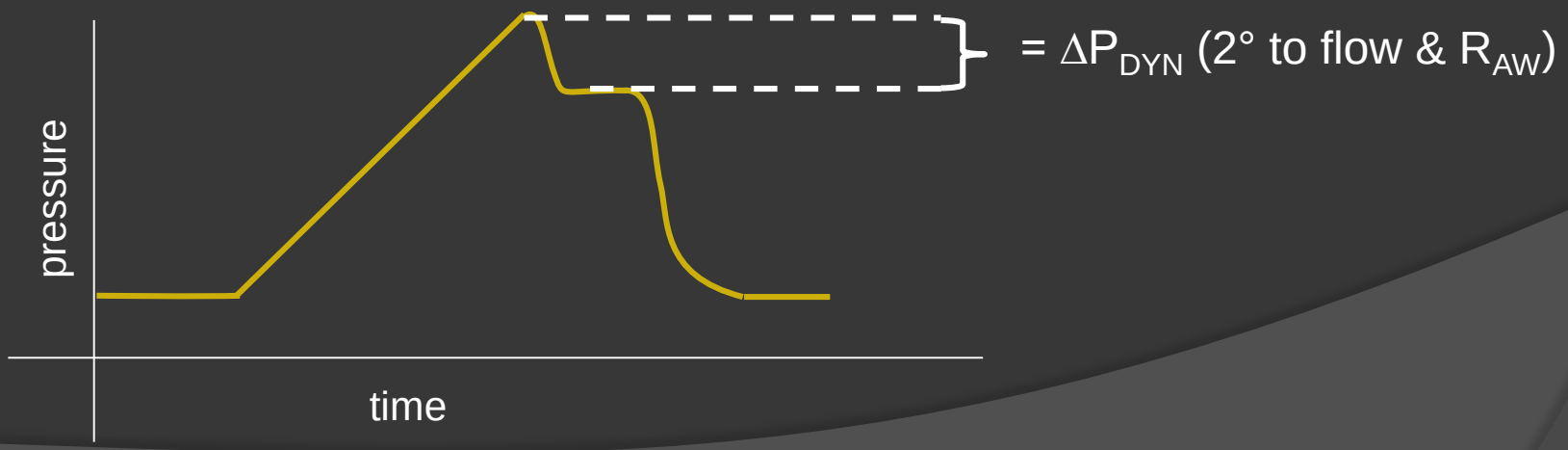


Any difference between $P_{PLATEAU}$ and PIP is due to flow and resistance to flow.

$PIP - P_{PLATEAU} = P_{DYN}$

Since $\dot{V} = \frac{\Delta P}{R_{AW}}$, then this formula can be rewritten so that:

$$R_{AW} = \frac{P_{DYN}}{\dot{V}}$$



## Resistance Problems

- Secretions
- Bronchospasm

## Compliance Issues

- Restrictive Lung Diseases
- Atelectasis
- Pneumonia
- ARDS

# *Take Home Points*

- Greater the variance between PIP and $P_{PLAT}$ (increase $P_{DYN}$) indicates an increase in resistance

- A compliance issue is indicative of a decrease $P_{DYN}$ (less variance of PIP and $P_{PLAT}$)

# *Questions??*