PLATEAU PRESSURE – Michael Kissel, MD

The plateau pressure (PP) is the pressure applied to small airways and alveoli. It is measured during an inspiratory pause on the ventilator. The goal plateau pressure is <30 cm H2O to prevent volutrauma; that is lung injury secondary to overdistension of alveoli. Without lung disease, peak inspiratory pressure (PIP) is only slightly above the plateau pressure. In cases of increased tidal volume or decreased pulmonary compliance, the PIP and plateau pressure rise together proportionately. If the peak pressure rises with no change in plateau pressure, increased airway resistance should be suspected or high inspiratory gas flow rates. A list of causes of increased PIP with or without increased plateau pressure is noted below. One should note the relationship of plateau pressure with static compliance of the lung (Cstat). The formula for static compliance is as follows:

\[ \text{Cstat} = \frac{\text{Vt}}{\text{Pplat} - \text{PEEP}} \]

Where:
- \( \text{Cstat} \) = Static Compliance of the lung
- \( \text{Vt} \) = tidal Volume
- \( \text{Pplat} \) = Peak Plateau Pressure
- \( \text{PEEP} \) = Positive End Expiratory Pressure

**Increased PIP and Pplat:**

Increased tidal volume
Decreased pulmonary compliance
- Pulmonary edema
- Pleural effusion
- Peritoneal gas insufflation
- Tension pneumothorax
- Trendelenburg
- Ascites
- Abdominal packing
- Endobronchial intubation

**Increased PIP and Unchanged Pplat:**

Increased inspiratory gas flow rate
Increased airway resistance
- Kinked ET tube
- Secretions
- Foreign body aspiration
- Bronchospasm
- Airway compression
- ET tube cuff herniation

References:
