The Peak Inspiratory Pressure Has Increased… Now What Do I Do?

1) **What Determines Peak Inspiratory Pressure?**
The peak inspiratory pressure (PIP) reflects how hard the ventilator must “work” to deliver a breath and is a function of three variables: (1) the inspiratory flow rate and flow pattern; (2) airway resistance (including the endotracheal tube and circuit); and (3) the compliance of the respiratory system. If the flow rate and flow pattern have not changed, any change in PIP is due to either a change in resistance or a change in compliance.

2) **What Are Common Causes of Changes in Resistance or Compliance?**

<table>
<thead>
<tr>
<th>Increased Resistance</th>
<th>Decreased Compliance</th>
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</thead>
<tbody>
<tr>
<td>Airway secretions</td>
<td>Abdominal distention</td>
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<tr>
<td>Bronchospasm</td>
<td>Pleural effusions</td>
</tr>
<tr>
<td>Kinks in circuit tubing</td>
<td>Pneumothorax</td>
</tr>
<tr>
<td>Patient biting on ET tube</td>
<td>Pulmonary edema / ARDS</td>
</tr>
</tbody>
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3) **How Do I Distinguish Between Resistance and Compliance Issues on the Ventilator?**
Perform an inspiratory pause maneuver. During the pause, there is no airflow and, therefore, resistance is no longer a factor. The pressure measured during the pause (referred to as the “plateau” or “static” pressure) is the pressure needed to keep the system open at that volume and reflects the compliance of the respiratory system. In comparison to measurements done before the change in PIP, one of two situations can be seen:

4) **Management**

**Resistance Problem:** (Peak pressure increased, plateau pressure unchanged)
- Suction the ET Tube
- Bronchodilators
- Check endotracheal and circuit tubing for kinks or patient biting on the tube

**Compliance Problem:** (Peak pressure and plateau pressure increased)
- Sudden change: rule out pneumothorax with chest radiograph and/or chest ultrasound
- Less sudden changes:
  - Chest radiograph
  - Review fluid balance
  - Examine the abdomen. Consider bladder pressure measurement if tense