The purpose of this study was to compare the target tidal volume to the actual tidal volume when ventilating an electronic test lung simulating a COPD model and an ARDS model. During Adaptive Support Ventilation on the Hamilton G5, the G5 appears to deliver a tidal volume very close to the target tidal volume when using an electronic lung simulating various disease states and will provide spontaneous ventilation.

**Methodology**: A Hamilton G5 was connected to an electronic lung simulator, the Hans Rudolph HR 1101. The HR 1101 allows the simulation of various disease states and will provide spontaneous ventilation. The HR 1101 settings used were: Amplitude 10, Effort Slope 5, % Inhale 20, and Rate 15/minute. Hamilton G5 settings used were: 100% Minute Ventilation, Pressure Support 25 then 30 cm H\textsubscript{2}O, and PEEP 5 cm H\textsubscript{2}O.

**Results**: The delivered tidal volume was very consistent on each breath. Further studies are necessary to determine the accuracy of delivered tidal volume using Adaptive Support Ventilation on the Hamilton G5 when ventilating patients. The tidal volume was consistent on each breath. Further studies are necessary to determine the accuracy of the delivered volume using Adaptive Support Ventilation on the Hamilton G5 when ventilating an electronic test lung simulating a COPD model and an ARDS model.

**Conclusion**: During Adaptive Support Ventilation on the Hamilton G5, the G5 ventilated the HR 1101 such that the displayed tidal volume was very consistent on each breath. Further studies are necessary to determine the accuracy of the delivered volume using Adaptive Support Ventilation on the Hamilton G5 when ventilating an electronic test lung simulating various disease states and will provide spontaneous ventilation.

**Accuracy of Delivered Tidal Volume Using Adaptive Support Ventilation on the Hamilton G5 When Ventilating an Electronic Test Lung Simulating a COPD Model and an ARDS Model**

<table>
<thead>
<tr>
<th>Compliance (cm H\textsubscript{2}O)</th>
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| COPD 3000 mL, Load Effort Normal, Rate 15/minute. Hamilton G5 ventilated the HR 1101 for two minutes between changing settings. At the end of the two minute period, the displayed tidal volume was recorded at the end of every minute for five minutes. The HR 1101 ventilated for two minutes after changing the resistance in the COPD model, and after changing the compliance in the ARDS model. At the end of each minute at each level of resistance for the COPD model, the tidal volume at the end of every minute for five minutes. The HR 1101 ventilated for two minutes after changing the compliance in the ARDS model.

The averaged displayed tidal volume was subtracted from the target tidal volume. The difference was then divided by the target tidal volume and expressed as a percentage. In the COPD model, as airway resistance was increased, the percent differences were 1.36, 1.94, 1.24 and 1.5%. With the ARDS model, as compliance was decreased, the percent differences were 2.11, 2.71, 1.58 and 2.13%.

**ARDS Graph**: The average displayed tidal volume and target tidal volume at each level of resistance for the ARDS model are displayed in the ARDS Graph. The average displayed tidal volume at the end of each minute at each level of resistance for the COPD model and average displayed tidal volume at each of the settings. The averaged tidal volume was subtracted from the target tidal volume. The ventilation was then changed to the next level of compliance for the ARDS model.