Category 1: **Respiratory: mechanical ventilation**
Category 2: **Respiratory: other support**

**A507 - Mechanical power decreased in acute respiratory distress syndrome patients supported with extracorporeal membrane oxygenation**

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**Introduction:**
We sought to use mechanical power to describe “lung rest” in patients with acute respiratory distress syndrome (ARDS) supported with extracorporeal membrane oxygenation (ECMO). Mechanical power describes work done by the ventilator on the patient’s respiratory system over time. This concept unifies tidal volume, rate, and total pressure delivered during the ventilatory cycle into a discrete value that may be useful to guide ventilatory support. We hypothesized that initiation of ECMO led to decreased mechanical power delivered to the patient.

**Methods:**
We reviewed the charts of the three medical intensive care unit patients at our institution supported with ECMO for severe ARDS. We collected data on plateau pressure, driving pressure, and mechanical power before initiating ECMO, then at <6 hours, 24 hours, and 72 hours after. We calculated the mechanical power delivered by the ventilator to the patient in Joules per minute as 0.098 x respiratory rate x tidal volume x (peak pressure - ½ x driving pressure)[1].

**Results:**
All patients were alive at discharge and at 90 days. Mean PaO\textsubscript{2}/FiO\textsubscript{2} at ECMO initiation was 64±38, mean plateau pressure was 37±3 cm water. All patients received neuromuscular blockade at initiation of ECMO. Following ECMO initiation, mechanical power decreased by an average of 58%±14% initially, by 69%±4% at 24 hours, and by 66%±17% at 72 hours (Figure 1). By comparison, driving pressure changed by an average value of -0.3±8.0, -0.3±5.5, and -2.0±4.6 cm water over those same intervals. Average plateau pressure changed by -3.3±5.7, -4.7±5.5, and -1.7±6.4 cm water during the same time period (Figure 2).

**Conclusion:**
In our limited case series, mechanical power decreased significantly following initiation of ECMO in patients with severe ARDS. We suggest mechanical power may be more useful than changes in driving pressure or plateau pressure when pursuing “lung rest” during ECMO.

**References:**

**Image 1:**

![Mechanical Power (J/min)](image1)

*Change in Mechanical Power after ECMO Initiation*

**Image 2:**
Change in Driving Pressure and Plateau Pressure after ECMO Initiation