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Evaluation of the RESP Score and Demographic Information in order to Predict Survival of ECMO Patients at a Community Hospital

**Jenna Kocsis**  
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### Introduction

Extracorporeal Membrane Oxygenation (ECMO) is the use of mechanical devices to temporarily support heart or lung function during cardiopulmonary failure, leading to organ recovery or replacement. Veno-venous ECMO is commonly used in patients with acute respiratory distress syndrome (ARDS) in which blood is withdrawn from and returned through the venous system. The patient’s blood is oxygenated and carbon dioxide is excreted via a membrane outside the body. ECMO is initiated in patients with ARDS when positive pressure ventilation cannot maintain adequate gas exchange to support life.

All 42 VV ECMO patients at LVHN have undergone this life-saving measure. Even though we have great statistics so far, much is to be learned and discovered. With its recent institution at Lehigh Valley Health Network, only 42 patients have undergone this procedure. ECMO at a community hospital is possible and very successful.

### Results

**The RESP Score**

The Australian and New Zealand Intensive Care Research Centre developed a method using pre-ECMO variables of 2,395 patients from the Extracorporeal Life Support Organization (ELSO) international registry. It assesses 12 pre-ECMO variables to determine a final score predicting survival for patients receiving ECMO for respiratory failure. The score can range anywhere from -22 to 15. The lower the score, the sicker the patient was before ECMO and the lower the chance of survival is assumed.

LVHN had a survival rate of 68.3% which was higher than the Extracorporeal Life Support Organization rate of 57%. When the survival percentages were broken down by RESP scores, LVHN surpassed the RESP article’s percentage in the first two categories, was slightly lower in the 3 to 5 category, and matched the RESP article’s rate for the 5 to 7 category. We believe our success could be due to three things: 24 hour attending physician supervision, a fully trained clinical staff in ECMO management, and an arsenal of rescue modes of ventilation.

A major limitation of this study was due to the small population of Venovenous ECMO patients. With its recent institution at Lehigh Valley Health Network, only 42 patients have undergone this life-saving measure. Even though we have great statistics so far, much is to be learned and verified. An ECMO database for Lehigh Valley Health Network was created for future data and analysis.

The first informative research study on VV ECMO patients at LVHN was performed showing great success for a community hospital. We hope our data and knowledge will influence other community hospitals to begin to initiate ECMO. I hope this study and evaluation of the RESP score will initiate the use of the RESP score at the bedside of a patient rather than calculating it retrospectively in order to prevent errors and slight discrepancies.

### Conclusion

**LVHN Survival %**

- 1 to 2 category, and matched the RESP article’s percentage in the first two categories, was slightly lower in the 3 to 5 category, and matched the RESP article’s rate for the 5 to 7 category. We believe our success could be due to three things: 24 hour attending physician supervision, a fully trained clinical staff in ECMO management, and an arsenal of rescue modes of ventilation.

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**References**


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**Thank You**

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**Methods**

All 42 VV ECMO patients’ data at LVHN was analyzed for demographic information and for the pre-ECMO variables instituted by the RESP score. The RESP score was then calculated for each patient based on the 12 parameters. The survival rates were then analyzed by overall score, age, gender, and BMI. The patients were also subcategorized into groups focusing on those who were diagnosed with H1N1 influenza, were administered a paralytic, those who were not administered a paralytic, those who developed a cardiac arrest, and those who were placed on high frequency percussive ventilation (VFD). In these groups, the average RESP score was calculated as well as the survival percentage in order to show a connection and highlight the importance of the RESP score.