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Nicole Stansbury
Taryn Samet MD
Tim S. Misselbeck MD
Lehigh Valley Health Network, Timothy_S.Misselbeck@lvhn.org
James K. Wu MD
Lehigh Valley Health Network, james.wu@lvhn.org

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Comparison of In-Line versus Conventional Independent Continuous Renal Replacement Therapy in Extracorporeal Membrane Oxygenation Patients

Nicole Stansbury1, Taryn Samet1, Rita Pechulis, MD2, James Burke, MD3, Timothy Mittlebeck, MD1, James Wu, MD1
Division of Cardiothoracic Surgery1, Division of Pulmonary and Critical Care Medicine2, Division of Cardiology3
Lehigh Valley Health Network Allentown, Pennsylvania

BACKGROUND
Extracorporeal Membrane Oxygenation (ECMO) is a treatment that provides support for critically ill patients experiencing pulmonary or cardiopulmonary failure. These patients are at high risk of developing acute kidney injury and often require additional treatment. Continuous renal replacement therapy (CRRT) provides constant management of renal functions and can be administered either in-line with ECMO or independently.

OBJECTIVE
This study seeks to determine if using the in-line CRRT technique provides comparable results to those using the conventional independent access.

METHODS
We evaluated ECMO patients from our in-house database for the years 2015 and 2016 at the Lehigh Valley Health Network who developed renal failure and required renal replacement therapy. We compared in-line vs. conventional independent access (IC) techniques.

RESULTS
• Out of a total 91 patients, there were 57 patients with renal complications, and 21 patients required CRRT.
• CRRT was deployed with IC in 11 cases with a discharge rate of 45.5%, and in-line with the ECMO circuit in 10 cases with a discharge rate of 30%.
• Of the patients that survived, 2 out of 3 patients that underwent CRRT in-line with ECMO regained renal function and 4 out of 5 of the IC patients regained function.
• Patients that underwent CRRT independently spent an average of 7.5 days on ECMO, and patients that underwent CRRT in line with ECMO spent an average of 11.5 days on it.

CONCLUSIONS
Patients who required CRRT with in-line technique often were sicker and had more central access issues. This was reflected in the lower discharge rate and increased time on ECMO. The complications were not a direct result of the in-line technique, but were most likely due to various prior comorbidities. The patients that were discharged regained proper renal function. Therefore, the in-line technique was comparable to the conventional independent access.

References: