

Retrospective Study on Outcomes of Veno-Venous and Veno-Arterial Extracorporeal Membrane Oxygenation

Kennedy Gallagher

Rachel Wills

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

Follow this and additional works at: <https://scholarlyworks.lvhn.org/research-scholars-posters>

Published In/Presented At

Gallagher, K., Wills, R., Misselbeck, T., Wu, J., (2017, July, 31) *Retrospective Study on Outcomes of Veno-Venous and Veno-Arterial Extracorporeal Membrane Oxygenation*. Poster presented at LVHN Research Scholar Program Poster Session, Lehigh Valley Health Network, Allentown, PA.

This Poster is brought to you for free and open access by LVHN Scholarly Works. It has been accepted for inclusion in LVHN Scholarly Works by an authorized administrator. For more information, please contact LibraryServices@lvhn.org.

Retrospective Study on Outcomes of Veno-Venous and Veno-Arterial Extracorporeal Membrane Oxygenation

Kennedy Gallagher, Rachel Wills, Timothy S. Misselbeck, MD, James K. Wu, MD
Division of Cardiothoracic Surgery

Lehigh Valley Health Network, Allentown, Pennsylvania

BACKGROUND

- Extracorporeal Membrane Oxygenation (ECMO) is a form of partial heart-lung bypass that provides support for critically ill patients with severe yet potentially reversible respiratory and/or cardiac failure¹
- ECMO is a supportive therapy that allows time for recovery of lung and/or heart function by directly oxygenating and removing CO₂ from the patient's blood
- ECMO provides direct respiratory support via veno-venous (VV) ECMO or cardiorespiratory support via veno-arterial (VA) ECMO²

OBJECTIVE

- This study analyzes the survival at discharge of patients treated with VV and VA-ECMO at the Lehigh Valley Health Network from 2013-2017

METHODS

A retrospective review of all VV and VA-ECMO patients recorded from 2013-2017 at the Lehigh Valley Health Network. The study included 112 VV-ECMO cases and 92 VA ECMO cases, including patients who underwent extracorporeal cardiopulmonary resuscitation (ECPR)

- Electronic hospital records were reviewed for demographic, etiology, and outcome information
- Data collection and analysis focused on survival rates after ECMO support was provided

OUTCOMES

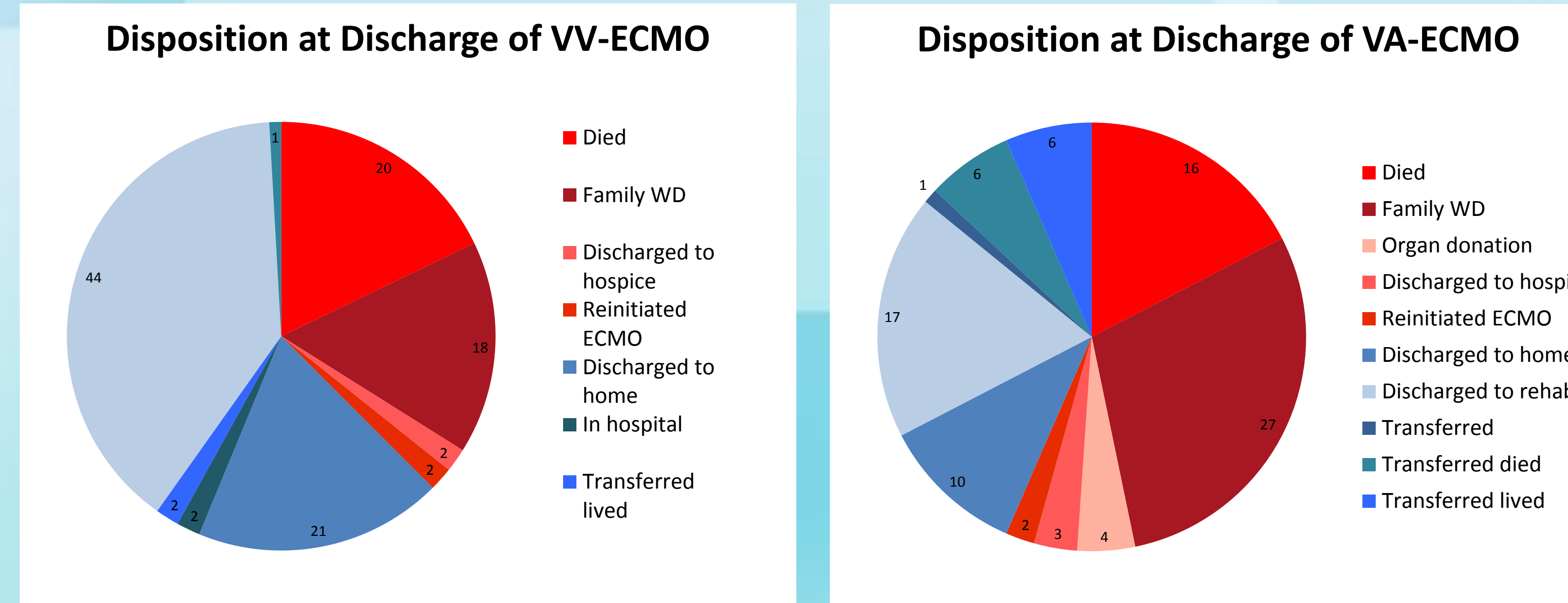


Figure 1: Positive (blue) and negative (red) outcomes were determined at the time of patient discharge. Overall outcomes for patients treated with VV-ECMO at LVHN show a survival rate of 63%. Of the patients treated with VA-ECMO, there was a 43% survival rate.

Type of ECMO Support:	VV ECMO		VA ECMO		VA ECMO (excluding ECPR)	
Date of Procedure:	Feb 2013- Dec 2015	Jan 2016- May 2017	Feb 2013- Dec 2015	Jan 2016- May 2017	Feb 2013- Dec 2015	Jan 2016- May 2017
Survival Rates at Discharge:	60.87%	65.12%	39.61%	48.71%	53.33%	64.70%

Figure 2: VV and VA-ECMO patients were split into two groups based on procedure date. The survival rate at discharge increased from Feb 2013-Dec 2015 to Jan 2016-May 2017 for both VV and VA-ECMO cases. The VA-ECMO survival rate that excludes ECPR patients shows the greatest increase between years.

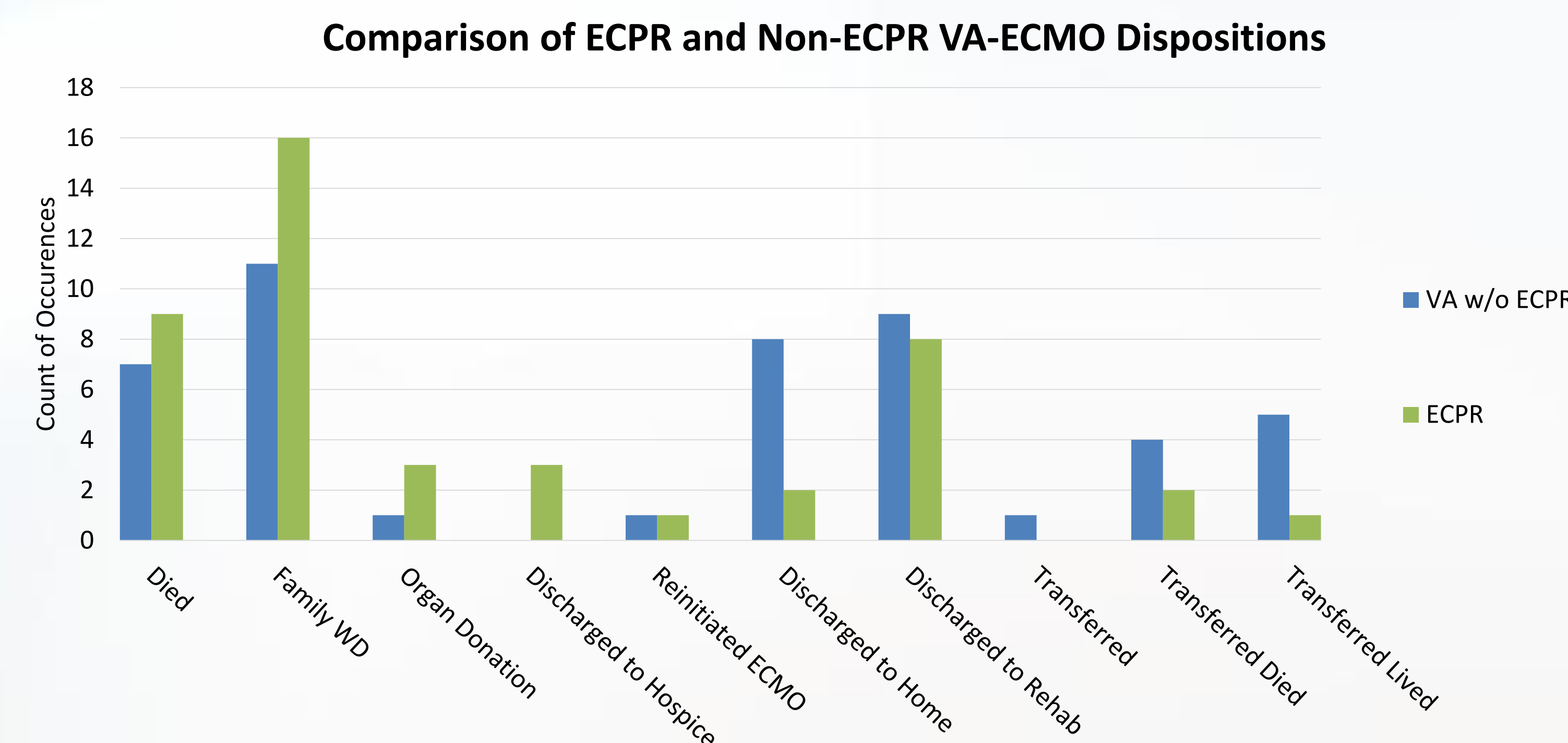


Figure 3: Comparison of patient dispositions at discharge between those who underwent ECPR and those who required VA-ECMO for other cardiopulmonary issues.

RESULTS

- Patients treated with VV-ECMO show a survival rate of 63% while patients treated with VA-ECMO show a survival rate of 43%, the majority of whom were discharged to rehab
- LVHN experienced a 5% increase in VV-ECMO survival, a 9% increase in VA-ECMO survival, and an 11% increase in the survival of VA-ECMO patients that did not undergo ECPR

CONCLUSIONS

- Increase in survival rates for both VV and VA-ECMO cases suggests that greater experience with ECMO may lead to greater patient survival over time
- ECPR patients who experienced cardiac arrest likely contributed to the lower survival rate in VA-ECMO patients
- Overall results of ECMO continue to demonstrate the importance of this life saving technology and service
- Future research should investigate how LVHN ECMO case volumes and outcomes compare to other ECMO centers across Pennsylvania

References

- ¹ Adrish, Muhammad, et al. "Extracorporeal Membrane Oxygenation." *Critical Care* Oropello JM, Pastores SM, Kvetan V, Oropello J.M., Pastores S.M., Kvetan V Eds. John M. Oropello, et al. New York, NY: McGraw-Hill, <http://accessmedicine.mhmedical.com/content.aspx?bookid=1944§ionid=143522594>.
- ² Makdisi, George, and I-wen Wang. "Extra Corporeal Membrane Oxygenation (ECMO) Review of a Lifesaving Technology." *Journal of Thoracic Disease* 7.7 (2015): E166-E176. *PMC*. Web. 19 July 2017.
- ³ Ventetuolo, Corey E., and Christopher S. Muratore. "Extracorporeal Life Support in Critically Ill Adults." *American Journal of Respiratory and Critical Care Medicine* 190.5 (2014): 497-508. *PMC*. Web. 20 July 2017.

© 2017 Lehigh Valley Health Network

610-402-CARE LVHN.org