

Casey Norlin, BS, Cynthia L Laviolette, PA-C, David J Hebert, RRT-NPS, Bharat Datt, MS, CCP, Amira Soliman, MD, Timothy Pettitt, MD, Kurt D Piggott, MD

Louisiana State University Health Sciences Center and Children's Hospital New Orleans

## BACKGROUND

Extracorporeal Membrane Oxygenation (ECMO) is bedside equipment that can replace the role of the heart and lungs (Fig. 1). ECMO use in pediatrics has increased, with survival rates between 42% and 73%, and higher survival for pulmonary versus cardiac patients.

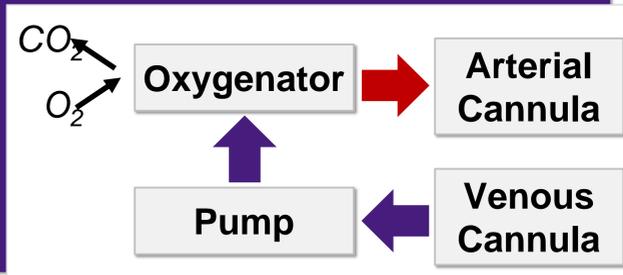
A predictive serum biomarker for ECMO survival remains elusive and would prove extremely valuable. We previously studied ECMO in neonates post-cardiac surgery and found that Nucleated Red Blood Cell (NRBC) value pre-decannulation predicted ECMO survival, while NRBC value post-decannulation predicted survival to discharge.

We investigate if NRBC values throughout pediatric patients' course predict ECMO survival and survival to discharge.

## METHODS

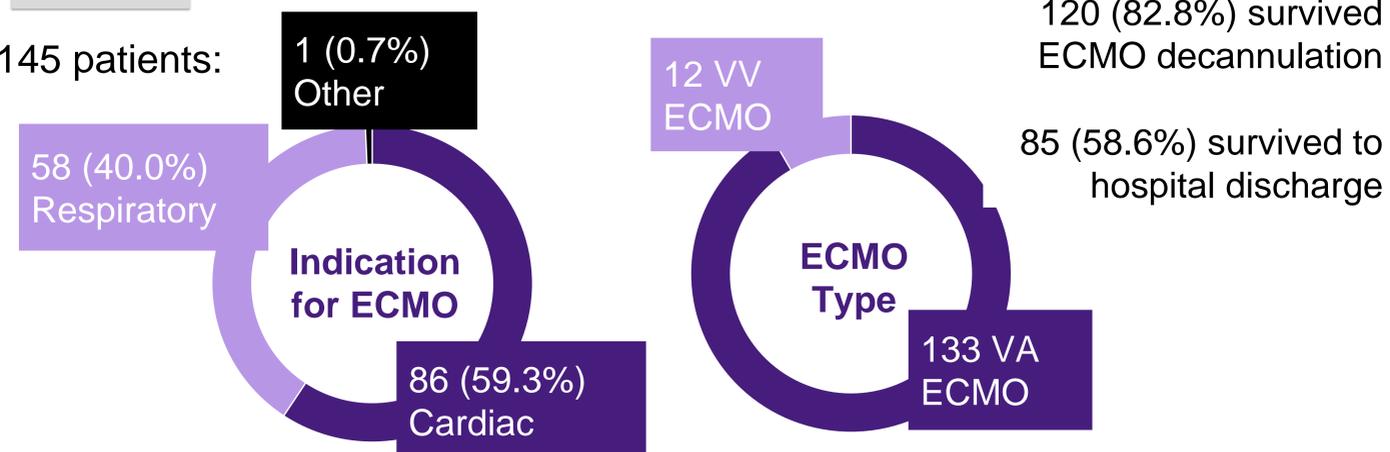
- We retrospectively collected data on pediatric patients requiring ECMO from 2011 to 2019 at Children's Hospital New Orleans.
- Collected variables:
  - Indication for ECMO
  - ECMO type (venoarterial (VA) vs. venovenous (VV))
  - NRBC values throughout ECMO course
- Measured outcomes:
  - ECMO survival
  - Survival to discharge
- Statistical analyses included student t-test, chi square, and multivariable logistic regression.

**Figure 1. ECMO Schematic**



## RESULTS

145 patients:



### Multivariable analysis of all patients

- NRBC value pre-decannulation was associated with ECMO survival (OR 1.14, CI 1.06-1.23, p=<0.001)
- NRBC value at ECMO initiation (OR 0.95, CI 0.9-1, p=0.04), peak NRBC during ECMO (OR 1.04, CI 1-1.1, p=0.04), and NRBC value post decannulation (OR 1.08, CI 1.02-1.14, p=0.009) were all associated with survival to hospital discharge

### Separate analyses of cardiac vs. respiratory patients

NRBC values were associated with measured outcomes for cardiac patients (Fig. 2) but no association was found for respiratory ECMO patients.

## CONCLUSION

In pediatric cardiac patients, NRBC peak value during ECMO, NRBC value pre-decannulation, and NRBC normalization post-ECMO may be predictive of ECMO survival and survival to hospital discharge.

However, NRBC values may not be predictive of ECMO survival for respiratory pediatric patients.

**Figure 2. NRBC values associated with ECMO survival in cardiac patients.**

NRBC Value	OR	CI	P value
Peak during ECMO	1.1	1.0-1.2	0.05
Pre-decannulation	1.15	1.03-1.29	0.016
Normalization post-ECMO	71.4	3.8-1000	0.004