

Children's Mercy Kansas City

## SHARE @ Children's Mercy

---

Research at Children's Mercy Month 2023

Research at Children's Mercy Month

---

5-2023

### Right ventricular dysfunction is common among pediatric patients with acute respiratory distress syndrome on venovenous ecmo

Cara Holton

*Children's Mercy Hospital*

Sanket Shah

*Children's Mercy Kansas City*

Jenna Miller

*Children's Mercy Hospital*

Let us know how access to this publication benefits you

Follow this and additional works at: [https://scholarlyexchange.childrensmercy.org/research\\_month2023](https://scholarlyexchange.childrensmercy.org/research_month2023)

---

#### Recommended Citation

Holton, Cara; Shah, Sanket; and Miller, Jenna, "Right ventricular dysfunction is common among pediatric patients with acute respiratory distress syndrome on venovenous ecmo" (2023). *Research at Children's Mercy Month 2023*. 3.

[https://scholarlyexchange.childrensmercy.org/research\\_month2023/3](https://scholarlyexchange.childrensmercy.org/research_month2023/3)

This Poster is brought to you for free and open access by the Research at Children's Mercy Month at SHARE @ Children's Mercy. It has been accepted for inclusion in Research at Children's Mercy Month 2023 by an authorized administrator of SHARE @ Children's Mercy. For more information, please contact [hlsteel@cmh.edu](mailto:hlsteel@cmh.edu).



# Right Ventricular Dysfunction is Common among Pediatric Patients with ARDS on VV ECMO



Caroline Holton, MD, Sanket Shah, MD MHS, Jenna Miller, MD FAAP

## Children's Mercy Kansas City

### Introduction

- RV dysfunction is common in pediatric ARDS (~40% incidence) and associated with increased mortality<sup>1,2</sup>
- RV dysfunction typically improves on VV-ECMO with time
- New adult data shows some develop new or worsened RV dysfunction while on VV-ECMO and this is associated with worse outcomes<sup>3</sup>
- No data to our knowledge on this phenomenon in pediatric patients with ARDS on VV!

### Methods

- Single center retrospective case series
- January 2010 – September 2022
- Inclusion criteria: Neonatal/pediatric patients on VV-ECMO for ARDS with an echo during ECMO run
- Exclusion criteria: single ventricle patients
- Echocardiogram reports were reviewed for evidence of qualitative RV systolic dysfunction, as well as other markers of RV injury including RV hypertrophy, dilation, and TAPSE scores
- Mann-Whitney U test used to compare differences between groups

### Results

- 25 patients identified
- 20/25 (80%) survived to decannulation
- 19/25 (76%) survived to ICU discharge
- **NEW RV injury seen in 12/25 (48%)**
  - 9/12 (75%) survived to decannulation and ICU discharge
  - 2/12 (17%) required conversion to VA-ECMO
- **NO RV injury seen in 13/25 (52%)**
  - 11/13 (85%) survived to decannulation and 10/13 (77%) to ICU discharge
  - 1/13 (8%) required conversion to VA-ECMO

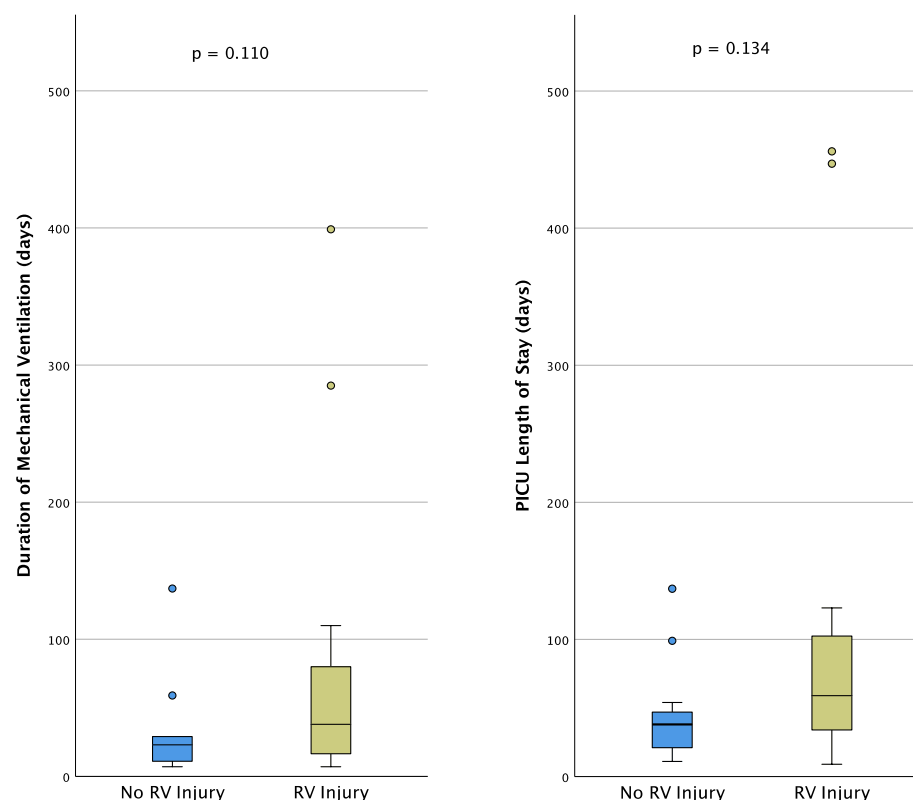
### Results

- 12/25 (48%) were extubated while on ECMO
  - 6/12 (50%) with RV injury
- RV dysfunction more common among long run (>21 days) patients
  - 60% of long runs vs 40% of short runs
- 9 survivors with RV dysfunction on ECMO
  - 7/9 had resolution of dysfunction post-ECMO
  - Time to resolution ranged from 1 to 181 days post-decannulation
- 3 patients without RV dysfunction on echo had evidence of RV injury on autopsy or cardiac cath

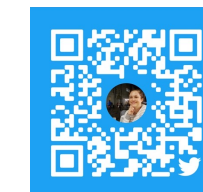
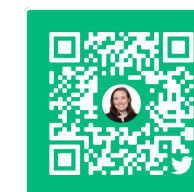
### Conclusions

**New RV dysfunction is common among pediatric ARDS patients on VV-ECMO and persists after decannulation.**

**Echo alone may not be sufficient to diagnose clinically relevant RV injury.**



Contact Info:  
[cholton@cmh.edu](mailto:cholton@cmh.edu)



#### References

1. Himebauch AS, Yehya N, Wang Y, et al. Early Right Ventricular Systolic Dysfunction and Pulmonary Hypertension Are Associated With Worse Outcomes in Pediatric Acute Respiratory Distress Syndrome. *Crit Care Med* 2018; 46: e1055–e1062
2. Himebauch AS, Yehya N, Wang Y, et al. New or Persistent Right Ventricular Systolic Dysfunction Is Associated With Worse Outcomes in Pediatric Acute Respiratory Distress Syndrome. *Pediatr Crit Care Med* 2020; 21: e121–e128.
3. Chad T, Yusuff H, Zochios V, et al. Right Ventricular Injury Increases Mortality in Patients with Acute Respiratory Distress Syndrome on Veno-Venous Extracorporeal Membrane Oxygenation: A Systematic Review and Meta-Analysis. *ASAIO Journal* 2022; 10.1097