

**Ryan Barbaro, MD, MSc**  
**Clinical Associate Professor in Pediatrics**  
**Susan B. Meister Child Health Evaluation and Research Center**  
**barbaror@umich.edu**

## **Education and Training**

### **Education**

08/2000-05/2004	BS, University of North Carolina, Chapel Hill, NC
08/2004-05/2008	MD, University of North Carolina School of Medicine, Chapel Hill, NC
07/2013-08/2014	MSc, University of Michigan Rackham Graduate School, Ann Arbor, MI

### **Postdoctoral Training**

06/2008-06/2011	Residency, Pediatrics, University of North Carolina, Chapel Hill, NC
07/2011-06/2014	Clinical Fellow, Pediatric Critical Care, University of Michigan, Ann Arbor, MI
07/2013-06/2015	Research Fellow, Pediatric Health Services Research, University of Michigan, Ann Arbor, Michigan

### **Professional Training**

03/2019-9/2019	Leadership Academy, University of Michigan, Ann Arbor, MI
02/2023-06/2023	Adaptive Leadership by Jill Hufnagel and Tim Steffensmeier of Kansas Leadership Center, University of Michigan, Ann Arbor, MI
09/2024-11/2024	Advancing Your People: Leadership Skills Series, University of Michigan, Ann Arbor, MI

## **Certification And Licensure**

### **Certification**

07/2008-07/2015	American Heart Association, Pediatric Advanced Life Support
07/2011-07/2014	American Heart Association, Advanced Cardiovascular Life Support
07/2011-07/2014	American Heart Association, Pediatric Advanced Life Support Instructor
10/2011-12/2020	American Board of Pediatrics, General Pediatrics
11/2014-11/2028	American Board of Pediatrics, Pediatric Critical Care Medicine

### **Licensure**

04/2011-Present	Michigan, Medical License
04/2011-Present	Michigan, Controlled Substance
05/2011-Present	Michigan, DEA License

## **Work Experience**

### **Academic Appointment**

07/2014-10/2017	Clinical Lecturer in Pediatrics - Intensive Care, University of Michigan, Ann Arbor
10/2017-09/2021	Clinical Assistant Professor in Pediatrics - Intensive Care, University of Michigan, Ann Arbor
09/2021-Present	Clinical Associate Professor in Pediatrics - Intensive Care, University of Michigan, Ann Arbor

### **Administrative Appointment**

08/2014-02/2018	Pediatric ECMO Co-Director, Department of Pediatrics, University of Michigan, Ann Arbor
03/2018-Present	Pediatric ECMO Director, Department of Pediatrics, University of Michigan, Ann Arbor
09/2021-Present	Service Chief, Pediatric Critical Care, University of Michigan, Ann Arbor
09/2022-Present	Associate Director for Research, Department of General Pediatrics, Child Health Education and Research (CHEAR), Ann Arbor

### **Academic Center/Institute Appointment**

07/2015-Present	Core Faculty, Department of General Pediatrics, Child Health Education and Research (CHEAR), Ann Arbor
05/2016-Present	Member, Institute for Healthcare Policy and Innovation, Ann Arbor
05/2016-Present	Member, Michigan Center for Integrative Research in Critical Care (MCIRCC), Ann Arbor

### **Clinical Appointments**

07/2014-Present	Attending Staff Physician, University of Michigan Health System, Ann Arbor
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### **Research Interests**

My research has focused on improving ECMO support in children by analyzing how hospital structure and processes of care influence patient outcomes and seeking to better understand and improve the neurodevelopmental outcomes for children receiving ECMO support.

### **Clinical Interests**

Extracorporeal Membrane Oxygenation (ECMO) Support for Respiratory Failure; Pediatric Acute Respiratory Distress Syndrome; Long-Term Neurodevelopment and Quality of Life Outcomes after Critical Illness and ECMO Support

### **Clinical Track Scholarly Contribution**

#### **Clinician-Research Scholar**

My scholarly contributions have focused on improving ECMO support in children. ECMO is a form of advanced life support that can be used in children with refractory or cardiac failure. Within ECMO, my research has focused on three broad categories: developing risk adjustment models for ECMO-supported patients, analyzing how hospital structure and processes of care influence patient outcomes and studying the neurodevelopmental outcomes of ECMO survivors.

### **Grants**

#### **Current Grants**

R01NS133142: Predicting ECMO NeuroLogical Injuries using mACHiNe Learning (PELICAN): PI

NIH-DHHS-US-SubK sourced funding through the University of Texas Southwest  
07/2023-06/2028  
\$75,000

Building REgional Alliances to Advance Treatment and Health Equity in respiratory failure (BREATHE)  
Co-I (Principal Investigator: Joseph Kohne- Faculty Mentee)  
University of Michigan Research Scouts  
01/2024-01/2026  
100,000

TRAPPARDS- TRAjectory Prediction in Pediatric ARDS

Co-I (Principal Investigator: Joseph Kohne- Faculty Mentee)  
MICHR K12 Mentored Clinical Scientist Career Development Award, National Center for Advancing Translational Sciences (NCATS)  
5/2023-8/2025  
\$250,000

UH3HL159134: Pediatric Influence of Cooling duration on Efficacy in Cardiac Arrest Patients (P-ICECAP)  
Site PI: (Principal Investigator: Frank Moler)  
NIH-DHHS-US  
09/2021-08/2028

R01HL153519:ASCEND (ARDS in Children and ECMO initiation strategies impact on Neuro-Development):  
PI  
NIH-DHHS-US  
09/2020 - 06/2025  
\$3,423,802

### **Submitted Grants**

R01: Sources of Variation In Fluid Balance Management in Pediatric Acute Heart Failure n ECMO  
Co-I (Principal Investigator: Stephen Gorga)  
NIH-DHHS-US  
07/2025-06/2029  
\$3,069,105

R01HL174565: A Novel Nitric Oxide Donor for Surface Anticoagulation  
Co-I (Principal Investigator: Orsolya Lautner-Csorba)  
NIH-DHHS-US  
07/2025-06/2029  
\$3,103,583

### **Past Grants**

Evaluating Lung injury through Exhaled Volatile compounds and redox potential to predict ARDS and its Trajectory in childrEn (ELEVATE)  
PI  
Weil Institute's Kahn Grand Challenge, University of Michigan  
06/2023-12/2024  
\$100,000

W81XWH2210301: Trial of Indication-based Transfusion of Red Blood Cells in ECMO:  
Site PI (Principal Investigator: Lynn Sleeper)  
Army-DoD-US-SubK sourced funding through Children's Hospital Corporation  
07/2022 - 06/2024  
\$192,260

The effect of obesity in adolescents and young adults supported with ECMO for COVID-19  
Co-I (Principal Investigator: Cecilia Gallego Suarez- Fellow Mentee)  
Department of Pediatrics Resident and Fellow Research Grant Program, University of Michigan  
12/2023-06/2024  
5,000

Following Outcomes after Critical Illness: (FOCI)  
Co-I (Principal Investigator: Joseph Kohne- Faculty Mentee)  
CHEAR, University of Michigan  
09/2020 - 08/2021  
\$25,000

Socioeconomic Status as a Predictor of Pediatric Sepsis Morbidity and Mortality:  
Co-I (Principal Investigator: Kayla Phelps- Fellow Mentee)  
Diversity Equity and Inclusion (DEI) Trainee Grant, Department of Pediatrics  
09/2020 - 08/2021  
\$5,000

Supporting PARDS with Restricted versus Unrestricted Candidacy for ECMO (SPRUCE):  
PI  
Charles Woodson Pilot Research Award  
12/2018 - 12/2019  
\$35,000

K12HL138039: Training to Advance Care Through Implementation Science in Cardiac And Lung Illnesses  
(TACTICAL):  
Co-I  
NIH-DHHS-US  
09/2017 - 06/2023  
\$3,111,296

R01HD015434: Pediatric Implantable Artificial Lung:  
Co-I (Principal Investigator: Ronald Hirschl)  
NIH-DHHS-US  
09/2017 - 05/2023  
\$2,972,255

Automated Diagnosis of Pediatric Acute Respiratory Distress better than Clinical Recognition?:  
PI  
Charles Woodson Pilot Research Award  
07/2017 - 07/2018  
\$15,000

Development of a Case-Mix Adjustment Index to Compare Standardized Mortality Rate for Children  
Requiring Extracorporeal Membrane Oxygenation:  
PI  
Extracorporeal Life Support Organization (ELSO)  
02/2016 - 07/2019  
\$10,000

Predictors of Extracorporeal Life Support Outcomes in Infant Pertussis:  
Co-I (Principal Investigator: Michelle Domico)  
Extracorporeal Life Support Organization Research Grant  
12/2014 - 12/2016  
\$5,000

Developing and Applying an Extracorporeal Membrane Oxygenation Severity of Illness Index Score:  
PI  
Extracorporeal Life Support Organization (ELSO) Research Grant  
01/2014 - 12/2015  
\$4,700

T32 F025206-064171, NIH-09-PAF03051: Training Grant for Pediatric Health Services Research:  
National Institute of Child Health and Human Development  
07/2013 - 12/2015  
\$150,000

## Honors and Awards

### International

2014	Young Investigator Award, Euro Extracorporeal Life Support Organization
2022	Fellowship, Extracorporeal Life Support Organization

### National

2014	Travel Award Program for Young Investigators, Pediatric Academic Society
2017	Star Research Achievement Award, Society of Critical Care Medicine
2019	Presidential Citation, Society of Critical Care Medicine
2024	World's Top 2% of Scientists, Stanford University

### Regional

2008	David A Mayberry Award. Awarded for compassion and clinical scholarship in the care of children with cancer
2011	Evening of Scholarship Merit Award

### Institutional

2012	Making a Difference Award, University of Michigan
2021	The Evan Newport HOPE Award, The University of Michigan, Honors staff, faculty, students or teams who have demonstrated ongoing commitment to the philosophy of patient and family centered care
2023	SOAR Award, The University of Michigan, Recipients of The University of Michigan Medical School' SOAR VOO (Valuing Our Own) Awards as a recognition to them and their research teams on their exceptionally strong research program and notable contributions
2024	SOAR Award, The University of Michigan, Recipients of The University of Michigan Medical School' SOAR VOO (Valuing Our Own) Awards as a recognition to them and their research teams on their exceptionally strong research program and notable contributions
2024	Making A Difference Award, University of Michigan
2025	Making a Difference Award(s): March & July, University of Michigan

### Departmental

2023	Excellence in Clinical or Health Services Research, 2023 Chair's Award, Pediatrics, United States. This award recognizes an individual who has made significant contributions to child health-related clinical or health services research
2024	Outstanding Mentorship, 2024 Chair's Award, Pediatrics, United States. This award recognizes an individual who has been exceptional in supporting the professional development of students, house officers, research trainees, and faculty by sharing knowledge, experience, and expertise to help mentees make informed decisions and navigate challenges, offering support and motivation, and serving as a role model.

## Study Sections, Editorial Boards, Journal & Abstract Review

### Study Sections

#### International

2025 Reviewer, SDAP-2025-021, Peer Review Application, Health Research Board

#### National

2020 National Institutes of Health Surgery, Anesthesiology and Trauma, (Ad Hoc)

2021 - Present Chair, Data Safety Monitoring Board for the NICHD funded randomized clinical trial Catheter-Related Early Thromboprophylaxis with Enoxaparin (CRETE) Studies, (Ad Hoc)

2021 Reviewer, National Institutes of Health Surgery, Anesthesiology and Trauma Study Section, (Ad Hoc)

2022 Reviewer, National Institutes of Health, Clinical Trials Review Study Section, (Ad Hoc)

#### Institutional

2021 - Present Member, Data Safety and Monitoring Board, Fetal Endoscopic Tracheal Occlusion (FETO) Trial for Congenital Diaphragmatic Hernia (CDH), (Ad Hoc)

### Editorial Boards / Journal & Abstract Reviews

#### Editorial Boards

2023 - Present Member, Editorial Board, Pediatric Critical Care Medicine

#### Journal Review

2013 - Present Reviewer, Perfusion Journal (Ad Hoc)

2015 - Present Reviewer, Pediatric Critical Care Medicine

2017 - Present Reviewer, Critical Care Medicine (Ad Hoc)

2017 - Present Reviewer, ASAIO (Ad Hoc)

2019 - Present Reviewer, Circulation (Ad Hoc)

2019 - Present Reviewer, New England Journal of Medicine Catalyst (Ad Hoc)

2020 - Present Intensive Care Medicine (Ad Hoc)

2020 - Present Reviewer, Critical Care (Ad Hoc)

2020 - Present Reviewer, American Thoracic Society

### Teaching

### Mentorship

#### Resident/Fellow

07/2014-06/2017 Lauren Yagiela, University of Michigan, Pediatric Critical Care Medicine fellow. With my mentorship, Dr. Yagiela completed the University of Michigan health and healthcare master's program and authored manuscript #23. Currently, she is faculty at Detroit Medical Center, Career Mentorship

07/2014-06/2017 Asaad Beshish, University of Michigan, Pediatric Critical Care Medicine fellow. Dr. Beshish authored manuscript #14, and abstract #14 was awarded Best Abstract at ECMO and the Advanced Therapies for Cardiovascular and Respiratory Failure Conference 2020. Currently, he is faculty at the Children's Hospital of Atlanta as a pediatric cardiac intensivist, Career Mentorship

07/2015-06/2018 Erin Carlton, University of Michigan, Pediatric Critical Care Medicine fellow. During fellowship, Dr. Carlton published manuscript #37. Currently, she is faculty

	at the University of Michigan, Pediatric Critical Care Division, Career Mentorship
07/2016-06/2019	Stephen Gorga, University of Michigan, Pediatric Critical Care Medicine fellow. During fellowship, Dr. Gorga published manuscript #40. Currently, he is faculty at the University of Michigan, Pediatric Critical Care Division, Career Mentorship
07/2016-06/2019	Joseph Kohne, University of Michigan, Pediatric Critical Care Medicine fellow. During fellowship, Dr. Kohne completed a research project currently under review. Currently, he is faculty at the University of Michigan, Pediatric Critical Care Division, Career Mentorship
07/2017-07/2021	Sarah Harding, University of Michigan, Pediatric Critical Care Medicine fellow. Dr. Harding is a faculty member at Upstate Golisano Children's Hospital, Career Mentorship
07/2018-07/2021	Rachel Clarke, University of Michigan, Pediatric Critical Care Medicine fellow. Dr. Clarke has obtained IRB approval and is making progress on a prospective study evaluating children receiving ECMO support and is a faculty member at Upstate Golisano Children's Hospital, Career Mentorship
07/2019-08/2022	Kayla Phelps, University of Michigan, Pediatric Critical Care Medicine fellow. Dr. Phelps was awarded a department of pediatrics intramural Diversity Equity and Inclusion (DEI) Trainee Grant to study disparities in health care among critically ill children and is currently faculty at Children's Hospital New Orleans, Career Mentorship
07/2020-06/2023	Michael Stevens, University of Michigan, Pediatric Critical Care Medicine fellow. Dr. Stevens focused on implementation of a pediatric sepsis alert system and is currently faculty The University of Illinois Chicago, Career Mentorship
07/2022-06/2024	Cecilia Gallego Suarez, University of Michigan, Pediatric Critical Care Medicine fellow. Dr. Gallego Suarez focused on studying the impacts of obesity on ECMO outcomes and is currently faculty at Rainbow Babies & Children's Hospital, Career Mentorship
07/2024-present	Zach Rumlow, University of Michigan, Pediatric Critical Care Medicine fellow. Dr. Rumlow has focused on studying the impacts of ECMO on long-term outcomes.
07/2024-present	Kevin Gochenour, University of Michigan, Pediatric Critical Care Medicine fellow. Dr. Gochenour has focused on studying the impacts of ECMO on long-term outcomes

#### **Faculty/Staff Member**

07/2018-Present	Erin Carlton, University of Michigan, Pediatric Critical Care Medicine faculty. With my mentorship, Dr. Carlton completed the health and healthcare master's program, authored several manuscripts and I was a co-mentor for Dr. Carlton's implementation science career development award funded by National Institute of Heart, Blood, and Lung Institute (NHLBI), Career Mentorship
07/2019-Present	Stephen Gorga, University of Michigan, Pediatric Critical Care Medicine faculty. With my mentorship, Dr. Gorga primary completed the health and healthcare master's program and I have mentored him to submit a R01 to NHLBI (review pending).
07/2019-Present	Joseph Kohne, University of Michigan, Pediatric Critical Care Medicine faculty. With my mentorship, Dr. Kohne completed the health and healthcare master's program and was awarded a CHEAR Center Program Grant for which I am the senior investigator and mentor. I am a co-mentor for his K12 career development award from the National Center for Advancing Translational Sciences (NCATS), has received over 125,000 in intramural funding and has submitted as Co-PI a grant to the National Science Foundation (review pending).
07/2019-Present	Erica Andrist, University of Michigan, Pediatric Critical Care Medicine faculty. With my mentorship, Dr. Andrist completed the health and healthcare master's program and was awarded a CHEAR Center Program Grant for which I am the senior

investigator and mentor. With my mentorship Dr. Andrist was successfully awarded a bioethics supplement to my NHLBI funded R01 ASCEND.

07/2020 Blythe Pollack, University of Michigan, Pediatric Critical Care Medicine Nurse Practitioner. With my mentorship, Ms. Pollack engaged in professional societies and took on leadership roles and published manuscripts as a foundation to pursuing a research career. She is currently enrolled in University of Michigan PhD of Nursing.

## Teaching Activity

### Institutional

01/2012-Present	The Department of Pediatrics, University of Michigan: Pediatric Critical Care Medicine Didactic Lecture Series, given to residents and fellows. Titles of lectures include: Bronchiolitis and the Mechanical Ventilator: Lessons in Physiology, Evidence for the Oscillator, Lactic Acidosis, ECMO Physiology, Statistics, University of Michigan
03/2012-03/2012	The Department of Pediatrics, University of Michigan: Joint Critical Care Lecture Series, "Postoperative Management in Liver Transplant Patients", University of Michigan
07/2012-06/2017	The Department of Pediatrics, University of Michigan: Lectures given monthly to resident and fellow trainees during their rotation through the PICU. Titles of lectures include: Extracorporeal Membrane Oxygenation, Rescue Therapies in Acute Respiratory Distress Syndrome, and Sedation and Neuromuscular Blockade., University of Michigan
07/2013-06/2016	The Department of Pediatrics, University of Michigan: Simulate mock codes, twice monthly, with pediatric resident trainees and medical students, University of Michigan
07/2014-Present	The Department of Pediatrics, University of Michigan: As an attending physician, I supervise and actively teach during clinical rounds in the PICU for a week every month. Learners include medical students, nurse practitioner students, nurses, residents and fellows., University of Michigan
01/2015-01/2015	The Department of Pediatrics, University of Michigan: Child and Health Evaluation and Research (CHEAR) Unit Health Services Research Seminar Series, "The Best Path Forward to Pediatric ECMO", University of Michigan
03/2015-03/2015	The Department of Pediatrics, The University of Michigan: Pediatric Grand Rounds, "A Path Forward in Pediatric ECMO", University of Michigan
07/2015-06/2018	The Department of Pediatrics, University of Michigan: Quarterly interdepartmental conferences involving pediatric surgery, pediatric critical care medicine and other invitees to discuss best practice in pediatric ECMO care., University of Michigan
06/2022-present	C.S. Mott Children's Hospital Michigan, Co-Lead of the Clinical ECMO Simulations. They are held every other month. Simulations are based in the ICU and include the multidisciplinary participation and use of a novel cannulation model.
07/2023-present	C.S. Mott Children's Hospital Michigan, Co-Lead of Pediatric ECMO Clinical Curriculum. The curriculum spans two years and aims to support the development of experts and leaders in the clinical application of ECMO services across pediatric populations. Trainees include pediatric residents or fellows, surgical residents or fellows, nurse practitioners, physician assistants, faculty, ECMO Specialists, Nurses, Respiratory Therapists and Pharmacists. Lectures delivered monthly from local and international experts.

## Memberships in Professional Societies

2008 - Present	Fellow, American Academy of Pediatrics
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2011 - Present	Member, Society of Critical Care Medicine
2012 - Present	Member, Society of Pediatric Research
2016 - Present	Member, Extracorporeal Life Support Organization
2021 - Present	Member, American Heart Association Cardiogenic Shock Registry

## **Committee/Service**

### **International**

2015 -2024	Research Grants Committee, Extracorporeal Life Support Organization, Member
2016 - Present	Registry Committee for Extracorporeal Life Support Organization, ELSO, Chair
2020 - Present	Pediatric Acute Lung Injury Consensus Conference (PALICC2), an international committee aimed at updating the definition of pediatric acute respiratory distress syndrome and identifying consensus statements on best care, Pediatric Acute Lung Injury Consensus Conference, Member
2021 - Present	ELSO Conference Committee, Member
2022 - 2025	PediECMO, Pediatric Acute Lung Injury and Sepsis Investigator, Co-Chair

### **National**

2017 - 2020	White Paper Task Force, Society of Critical Care Medicine and Extracorporeal Life Support Organization, Chair
2019 - 2024	Anticoagulation Collaborative (PEACE), Pediatric ECMO, Advisory Board
2021 - 2024	Cardiogenic Shock Registry, American Heart Association, Member
2021	National Heart, Lung, and Blood Institute (NHLBI): Implementation Science Capacity Building Workshop, NHLBI, Member

### **Institutional**

2013 - 2014	Quality & Safety Committee, Department of Pediatrics, University of Michigan, C.S. Mott Children's & Women's Hospital, Advisor
2014 - Present	Clinical ECMO Management Committee, Department of Nursing ECMO Overhead, University of Michigan, ECMO, Advisor
2014 - 2016	Fellowship Oversight Committee, Department of Pediatrics, University of Michigan, Member
2016 - Present	Clinical Competency Committee, Department of Pediatrics, University of Michigan, Member
2016 - Present	ECMO, University of Michigan, Director
2020 - Present	PICeW Committee, Department of Pediatrics, University of Michigan, Founder
2021 - Present	Committee on Pediatric Trauma, Department of Pediatrics, University of Michigan, Board Liaison
2021 -2022	Pediatric Critical Care Medicine Faculty Recruitment Committee, University of Michigan, Chair
2022 - Present	Intramural Grants Program, Department of Pediatrics, University of Michigan, Member
2022 - Present	Kahn Pediatric Critical Care Grand Challenge, Oversight Committee, Weil Institute, Member
2022 - Present	Internal Advisory Board, The Max Harry Weil Institute for Critical Care Research and Innovation, Member
2022 - Present	Executive Committee, Susan B. Meister CHEAR Center
2022 - Present	CHEAR Leadership Team, Susan B. Meister CHEAR Center
2023 – Present	Susan B. Meister CHEAR Fellowship Steering Committee

## Professional Development/Continuing Education

1. Part-Time Research for the Busy Clinician, University of Michigan Faculty Development Seminar, 11/2024
2. Early Career Kickstart: Clinical Track, University of Michigan Faculty Development Seminar, 11/2024
3. Early Career Kickstart: Clinical Track, University of Michigan Faculty Development Seminar, 11/2025
4. Institute of Healthcare Policy and Innovation (IHPI) K Writing Workshop, University of Michigan Faculty Development Seminar, July 2025

## Scholarly Activities

### Presentations

#### Extramural Invited Presentation

##### Speaker

1. Extracorporeal Life Support, Cardiopulmonary Bypass Support Course, 06/2007, University of Iowa Hospitals
2. Intersections of Extracorporeal Membrane Oxygenation (ECMO) and Hematopoietic Stem Cell Transplant, Pediatric Acute Lung Injury and Sepsis Investigators (PALISI), 03/2014, San Diego, CA
3. Hospital ECMO Volume and ECMO Mortality Rates: Analysis of the ELSO Registry, 25th Anniversary ELSO Conference, 09/2014, San Diego, CA
4. Outcome in Extracorporeal Membrane Oxygenation, 31st Annual Children's National Symposium: ECMO and the Advanced Therapies for Respiratory Failure, 02/2015, San Diego, CA
5. When is Lung Injury Unrecoverable?, 31st Annual Children's National Symposium: ECMO and the Advanced Therapies for Respiratory Failure, 02/2015, San Diego, CA
6. ECMO Dilemmas, 32nd Annual Children's National Symposium: ECMO and the Advanced Therapies for Respiratory Failure, 02/2016, San Diego, CA
7. ECMO Outcomes, 27th Annual ELSO Conference, 09/2016, San Diego, CA
8. Long Term ECMO – How Long is Too Long?, 33rd Annual Children's National Symposium: ECMO and the Advanced Therapies for Respiratory Failure, 03/2017, San Diego, CA
9. Extracorporeal Resuscitation Consortium Registry, ECPR Research Meeting, 04/2017, Ottawa, Canada
10. ELSO Registry: What's New?, 6th Annual International EuroELSO Congress, 05/2017, Maastricht, Netherlands
11. ELCS and Big Data: Driving Innovation and Outcome, 63rd Annual ASAIO Conference, 06/2017, Chicago, Illinois
12. Let's Measure the Quality of Your ECMO, 28th Annual ELSO Conference, 09/2017, Baltimore, MD
13. Success: Negotiating What You Need, Setting a Realistic Timeline, Competing Priorities (How and When to Say "no"), PALISI Faculty Course: Building your clinical research career, 09/2017, San Diego, CA
14. Data Governance, Oversight and Uses – What are the Challenges, Requirements and Important Next Steps, Federal Drug Administration Cardiac Device Coordinated Research Network Kick-off Event, 11/2017, Silver Spring, MD
15. ELSO Registry for the New Era, 34th Annual Children's National Symposium: ECMO and the Advanced Therapies for Respiratory Failure, 02/2018, Keystone, CO
16. Hospital Variation in Pediatric In-patient ECMO Cost, 7th Annual International EuroELSO Congress, 05/2018, Prague, Czech Republic
17. ELSO as Research Infrastructure, 9th Annual World Congress on Pediatric Intensive and Critical Care, 06/2018, Singapore
18. What's New in The ELSO Registry, 29th Annual ELSO Conference, 09/2018, Scottsdale, AZ
19. Papers from The ELSO Registry, 29th Annual ELSO Conference, 09/2018, Scottsdale, AZ

20. Realizing the Value of the ELSO Registry, 6th Annual ELSO Conference, 11/2018, Santiago, Chile
21. Implementing Improvement with the ELSO Registry, 6th Annual ELSO Conference, 11/2018, Santiago, Chile
22. ECMO Volume and Outcome, 6th Annual ELSO Conference, 11/2018, Santiago, Chile
23. Risk Stratification and Outcomes in ECMO: Can We Identify High Risk Cardiac Patients?, 14th Annual Pediatric Cardiac Intensive Care Society, 12/2018, Miami, FL
24. ELSO Registry Update, 30th Bi-Annual ELSO Steering Committee Meeting, 02/2019, Denver, CO
25. ARDS in Children and ECMO initiation strategies' impact on Neuro-Development (ASCEND): a research proposal, Pediatric Acute Lung Injury and Sepsis Investigators Meeting, 03/2019, Snowbird, UT
26. ELSO Registry Update, 30th Annual ELSO Conference, 09/2019, Austin, TX
27. Early Venovenous ECMO Cannulation for Severe Pediatric ARDS, Society of Critical Care Medicine, 02/2020, Orlando, FL
28. Advancing Pragmatic Priorities & Pathways in Shock Research, Cardiac Safety Research Consortium, Cardiac Safety Research Consortium, 02/2020, National Harbor, MD
29. ARDS in Children and ECMO initiation strategies' impact on Neuro-Development (ASCEND), Pediatric Acute Lung Injury and Sepsis Investigators, 03/2020, New Orleans, LA
30. Data Matters: The ELSO Registry, ELSO COVID-19, ELSO, 06/2020, Virtual Webinar
31. Using the ELSO Registry to Improve Local Practice, 31st Annual ELSO Meeting, ELSO, 09/2020, Virtual Meeting
32. ECMO in COVID-19: An International Cohort Study of the ELSO Registry, 31st Annual ELSO Meeting, ELSO, 09/2020, Virtual Meeting
33. ELSO Registry Update, 31st Annual ELSO Meeting, ELSO, 09/2020, Virtual Meeting
34. ECMO in COVID-19, Jefferson Health COVID-19 and ECMO Webinar Series, 10/2020, Virtual Presentation
35. COVID in Adult and Pediatric ECMO per the Registry, The 37th Annual Children's National Symposium: ECMO & Advanced Therapies for Cardiac & Respiratory Failure, 02/2021, Virtual Presentation
36. ECMO in COVID-19, Canadian Cardiovascular Critical Care Society (CANCARE), 02/2021, Virtual Presentation
37. Investigator Update ASCEND, PALISI, 03/2021, Virtual Presentation
38. Observational Registries: Successes, Pitfalls, What Can Be Fixed Now, and Future Collaborations, Cardiac Safety Research Consortium, 03/2021, Virtual
39. ECMO in COVID-19: The World Experience, ECMO-day for the International Symposium on Intensive Care and Emergency Medicine, 04/2021, Virtual
40. Benchmarking Paediatric ECMO in the Face of Practice Variations, American Society of Extracorporeal Technology (AmSECT) 59th International Conference (Virtual), 05/2021, Virtual
41. Late-Breaking Research from The Lancet: ECMO for COVID-19: Evolving Outcomes from the International ELSO Registry, Plenary Session, ELSO's 32nd Annual Conference, 09/2021, Virtual
42. Using Real-World Data for ECMO Regulatory Reports: Challenges and Potential Solutions, ELSO's 32nd Annual Conference, 09/2021, Virtual
43. ECLS strategies for lung failure in COVID-19, 35th Annual European Association for Cardio-Thoracic Surgery (EACTS), 10/2021, Barcelona
44. ECMO support in PARDS and COVID-19, Stanford Pediatric Critical Care Fellows Conference, 11/2021, Palo Alto, CA (Virtual)
45. Respiratory ECMO Support in Children, Children's Healthcare of Atlanta, Critical Care Medicine Seminar Respiratory ECMO Support in Children, 02/2022, Atlanta, Georgia
46. Will the Next Decade Bring Accelerating ECMO Utilization (as after 2009 H1N1 pandemic)?, 8<sup>th</sup> Annual SWAAC ELSO Conference, 02/2022, Riyadh, Kingdom of Saudi Arabia

47. Utilizing ELSO Registry to Improve Patient Outcomes and Update, 8th Annual SWAAC ELSO Conference 2022, 02/2022, Riyadh, Kingdom of Saudi Arabia
48. ECMO in PARDS- Is it worth it?, UK's Paediatric Critical Care Society (PCCS) Webinar, 03/2022, London, UK (Virtual)
49. ELSO Registry Update, Barbaro R, 33rd Annual ELSO Conference, 09/2022, Boston, MA
50. Real World Data for Regulatory Evaluation of ECMO: FDA, Device Developers and Registry, Barbaro R, 33rd Annual ELSO Conference, 09/2022, Boston, MA
51. Common Implementation Research Study Designs, Barbaro R, PALISI, 09/2022, Indianapolis, IN
52. How to Measure Comparative Outcomes Using ELSO Data, Barbaro R, ECMO and Advanced Therapies for Respiratory Failure Symposium, 02/2023, Keystone, CO
53. ECMO-Core Elements Needed for Trials Regulation And quality of Life (ECMO-CENTRAL): Adverse Events for Clinical Trials, Barbaro R, PALISI, 03/2023, Lake Tahoe, CA
54. Optimising outcomes VV-ECMO. Barbaro RP, 11<sup>th</sup> EuroELSO Conference 05/2023, Lisbon, Portugal
55. Tracheostomy in Pediatric ECMO. Barbaro RP, 11<sup>th</sup> EuroELSO Conference 05/2023, Lisbon, Portugal
56. ARDS in Children and ECMO initiation strategies impact on Neuro-Development (ASCEND) Overview and update. 11<sup>th</sup> EuroELSO Conference 05/2023, Lisbon, Portugal
57. Pediatric ECMO evolution, science, future. Grand Rounds. 08/2023, Advent Health for Children, Orlando Florida (Virtual)
58. Leveraging Registries to Support Your ECMO Work. 34<sup>th</sup> ELSO Conference 09/2023, Seattle, WA
59. ECMO-Core Elements Needed for Trials Regulation And quality of Life (ECMO-CENTRAL) 34<sup>th</sup> ELSO Conference 09/2023, Seattle, WA
60. Real world data analyses for ECMO device regulatory clearance Pediatric ECMO Anticoagulation Collaborative (PEACE) Research Priorities Meeting, 09/2023, Boston, MA
61. ECMO for COVID-19: evolving outcomes since 2020. 6<sup>th</sup> Asia-Pacific ELSO Seoul, South Korea, 11/2023.
62. Does the Timing of ECMO Cannulation Modify Patient Outcomes in Children Supported With ECMO for Respiratory Failure? 2024 Society of Critical Care Medicine (SCCM), 01/2024, Phoenix, AZ
63. Inova 2024 ECMO Symposium: Contemporary Concepts in Extracorporeal Life Support, 03/2024 Fairfax, VA
64. First Hours After ECPR, 12<sup>th</sup> EuroELSO Conference 04/2024, Krakow, Poland
65. Sepsis on ECMO, 12<sup>th</sup> EuroELSO Conference 04/2024, Krakow, Poland
66. Management of Traumatic Injuries with ECMO, 12<sup>th</sup> EuroELSO Conference 04/2024, Krakow, Poland
67. The ARC-Central Consensus, 12<sup>th</sup> EuroELSO Conference 04/2024, Krakow, Poland
68. Learning Lessons from a Big Dose of Critical Illness – An ECMO Talk, University of Pittsburgh Medical Center, 5/2024, Pittsburgh, PA
69. Brain and ECMO: Optimizing Long-Term Outcomes, WFPICCS, 06/2024, Cancun, Mexico
70. PediECMO Overview and Updates, 35th Annual ELSO Conference, 10/2024, Detroit, MI
71. Long-Term Consequences of Neurologic Injury in Pediatric ECMO. 2025 Society of Critical Care Medicine (SCCM), 01/2025, Orlando, FL
72. Parental Perspectives on ECMO Research, Palisi Spring Meeting, 04/2025, Santa Fe, NM
73. ECMO CORE Protocol, PALISI Spring Meeting, 04/2025, Santa Fe, NM

74. Pediatric Research Session: The Unmet Needs of the Pediatric ECMO Research, 13<sup>th</sup> EuroELSO Conference, 04/2025, Milan, Italy
75. Interdisciplinary Session: Utilizing the ELSO Registry for Scholarly Work and Future AI Research, Utilization of the Registry to Design Studies, Answering both Clinical and Quality Sessions", 13<sup>th</sup> EuroELSO Conference, 04/2025, Milan, Italy
76. ECMO Research, Visiting Professor, Texas Children's Hospital, 06/2025, Houston, TX
77. Balancing Bleeding and Thrombosis on ECMO: From The Ideal to Real Bedside Challenges, 34<sup>th</sup> International Congress, Science of Pediatric and Neonatal Intensive Care, 06/2025, Alicante, Spain
78. Role of Mechanical Ventilation during ECMO, 34<sup>th</sup> International Congress, Science of Pediatric and Neonatal Intensive Care, 06/2025, Alicante, Spain
79. Plenary Session 04, Cardiac Interactions in ARDS, 34<sup>th</sup> International Congress, Science of Pediatric and Neonatal Intensive Care, 06/2025, Alicante, Spain
80. Initiating ECPR is Easy – But What About Stopping it? 34<sup>th</sup> International Congress, Science of Pediatric and Neonatal Intensive Care, 06/2025, Alicante, Spain

#### **Moderator**

1. ECMO and Anticoagulation, BloodNet and PALISI Sponsored Debates, 03/2021, Virtual
2. Making the Most of the ELSO Registry, ELSO's 32nd Annual Conference, 09/2021, Virtual
3. Neonatal and Pediatric ECMO Research, 12<sup>th</sup> EuroELSO Conference 04/2024, Krakow, Poland
4. Pediatric ECMO Research, ELSO's 34th Annual Conference, 09/2023, Seattle, WA
5. Pediatric ECMO Research, ELSO's 35th Annual Conference, 10/2024, Detroit, MI
6. Can Learning Healthcare Systems Bridge the Data Generation Gap to Inform Critical Care of Children? 2025 Society of Critical Care Medicine (SCCM), 01/25, Orlando, FL
7. Educational Corner Workshop, 13<sup>th</sup> EuroELSO Conference, 04/2025, Milan, Italy
8. Plenary Session 03, International Trials and Research (Chair), 34<sup>th</sup> International Congress, Science of Pediatric and Neonatal Intensive Care, 06/2025, Alicante, Spain

#### **Panel**

1. Ask the Expert: Early Mobilization In An Intubated Patient? Let's Take the Patient Out Of The Bed, WFPICCS, 06/2024, Cancun, Mexico
2. Variations in ECMO Management, PALISI Spring Meeting, 04/2025, Santa Fe, NM

#### **Intramural Invited Presentation**

#### **Speaker**

1. A Path Forward in Pediatric ECMO, CME, Pediatric Grand Rounds, University of Michigan, 03/2015
2. Anticoagulation and Pharmacologic Management, CME, ECMO Specialist Training Course, The University of Michigan; these were for non-UofM affiliates, 10/2017, Ann Arbor, MI
3. ECMO for Respiratory Failure and VV ECMO, CME, ECMO Specialist Training Course, The University of Michigan; these were for non-UofM affiliates, 10/2017, Ann Arbor, MI
4. Anticoagulation and Pharmacologic Management, CME, ECMO Specialist Training Course, The

University of Michigan; these were for non-UofM affiliates, 11/2017, Ann Arbor, MI

5. Anticoagulation and Pharmacologic Management, CME, ECMO Specialist Training Course, The University of Michigan; these were for non-UofM affiliates, 04/2018, Ann Arbor, MI

6. Lessons from a Big Dose of Critical Illness, Barbaro R, Child Health Evaluation and Research Center, 05/2024, Ann Arbor, Michigan

## Publications/Scholarship

(Co-First Author \*; Corresponding author \*\*; Co-Last author \*\*\*)

## Peer-Reviewed

### Journal Article

1. Nadler JJ, Moy SS, Dold G, Trang D, Simmons N, Perez A, Young NB, **Barbaro RP**, Piven J, Magnuson TR, Crawley JN: Automated apparatus for quantitation of social approach behaviors in mice. *Genes, Brain and Behavior*.3(5): 303-314, 10/2004. PM15344923
2. Moy SS, Nadler JJ, Perez A, **Barbaro RP**, Johns JM, Magnuson TR, Piven J, Crawley JN: Sociability and preference for social novelty in five inbred strains: An approach to assess autistic-like behavior in mice. *Genes, Brain and Behavior*.3(5): 287-302, 10/2004. PM15344922
3. Moy SS, Nadler JJ, Young NB, Perez A, Holloway LP, **Barbaro RP**, Barbaro JR, Wilson LM, Threadgill DW, Lauder JM, Magnuson TR, Crawley JN: Mouse behavioral tasks relevant to autism: Phenotypes of 10 inbred strains. *Behavioural Brain Research*.176(1): 4-20, 01/2007. PM16971002
4. **Barbaro RP**, Odetola FO, Kidwell KM, Paden ML, Bartlett RH, Davis MM, Annich GM: Association of hospital-level volume of extracorporeal membrane oxygenation cases and mortality. Analysis of the extracorporeal life support organization registry. *Am J Respir Crit Care Med*.191(8): 894-901, 04/2015. PM25695688
5. **Barbaro RP**, Bartlett RH, Chapman RL, Paden ML, Roberts LA, Gebremariam A, Annich GM, Davis MM: Development and Validation of the Neonatal Risk Estimate Score for Children Using Extracorporeal Respiratory Support. *J Pediatr*.173: 56-61, 01/2016. PM27004674
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8. **Barbaro RP**, Paden ML, Guner YS, Raman L, Ryerson LM, Alexander P, Nasr VG, Bembea MM, Rycus PT, Thiagarajan RR: Pediatric Extracorporeal Life Support Organization Registry International Report 2016. *ASAIO J*.63(4): 456-463, 01/2017. PM28557863
9. Thiagarajan RR, **Barbaro RP**, Rycus PT, McMullan DM, Conrad SA, Fortenberry JD, Paden ML: Extracorporeal Life Support Organization Registry International Report 2016. *ASAIO J*.63(1): 60-67, 01/2017. PM27984321
10. Kuo KW, **Barbaro RP**, Gadepalli SK, Davis MM, Bartlett RH, Odetola FO: Should Extracorporeal Membrane Oxygenation Be Offered? An International Survey. *Journal of Pediatr*.182: 107-113, 03/2017. PM28041665
11. Yu JS, **Barbaro RP**, Granoski DA, Bauman ME, Massicotte MP, Lequier LL, Annich GM, Ryerson LM: Prospective side by side comparison of outcomes and complications with a simple versus intensive anticoagulation monitoring strategy in pediatric extracorporeal life support patients. *Pediatric Critical Care Medicine*.18(11): 1055-1062, 11/2017. PM28922263
12. Guner YS, Nguyen DV, Zhang L, Chen Y, Harting MT, Rycus P, **Barbaro R**, Di Nardo M, Brogan TV, Cleary JP, Yu PT: Development and Validation of Extracorporeal Membrane Oxygenation Mortality-Risk Models for Congenital Diaphragmatic Hernia. *ASAIO J*. 64(6): 785-794, 01/2018. PM29117038
13. Johnson K, Jarboe MD, Mychaliska GB, **Barbaro RP**, Rycus P, Hirschl RB, Gadepalli SK: Is There a Best Approach for Extracorporeal Life Support Cannulation: A Review of the Extracorporeal Life Support

Organization. *J Pediatr Surg*.53(7): 1301-1304, 01/2018. PM29459043

14. Beshish AG, Baginski MR, Johnson TJ, Deatrick BK, **Barbaro RP**, Owens GE: Functional Status Change Among Children with Extracorporeal Membrane Oxygenation to Support Cardiopulmonary Resuscitation in a Pediatric Cardiac ICU: A Single Institution Report. *Pediatr Crit Care Med*.19: 665-671, 01/2018. PM29659415
15. Swol J, Brodie D, Napolitano L, Park PK, Thiagarajan R, **Barbaro RP**, Lorusso R, McMullan D, Cavarocchi N, Hssain AA, Rycus P, Zonies D: Indications and Outcomes of Extracorporeal Life Support in Trauma Patients. *J Trauma Acute Care Surg*.84(6): 831-837, 01/2018. PM29538235
16. Conrad SA, Broman LM, Taccone FS, Lorusso R, Malfertheiner MV, Pappalardo F, Di Nardo M, Belliato M, Grazioli L, **Barbaro RP**, McMullan DM, Pellegrino V, Brodie D, Bembea MM, Fan E, Mendonca M, Diaz R, Bartlett RH: The Extracorporeal Life Support Organization Maastricht Treaty for Nomenclature in Extracorporeal Life Support A Position Paper of the Extracorporeal Life Support Organization. *Am J Respir Crit Care Med*.198(4): 447-451, 01/2018. PM29614239
17. Domico M, Ridout D, MacLaren G, **Barbaro R**, Annich G, Schlapbach LJ, Brown KL: Extracorporeal Membrane Oxygenation for Pertussis: Predictors of Outcome Including Pulmonary Hypertension and Leukodepletion. *Pediatr Crit Care Med*.19(3): 254-261, 03/2018. PM29319632
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20. Bailly DK, Reeder RW, Winder M, **Barbaro RP**, Pollack MM, Moler FW, Meert KL, Berg RA, Carcillo J, Zuppa AF, Newth C, Berger J, Bell MJ, Dean MJ, Nicholson C, Garcia-Filion P, Wessel D, Heidemann S, Doctor A, Harrison R, Bratton SL, Dalton H, for Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) Collaborative Pediatric Critical Care Research Network (CPCCRN): Development of the Pediatric Extracorporeal Membrane Oxygenation Prediction Model for Risk-Adjusting Mortality. *Pediatr Crit Care Med*.20(5): 426-434, 05/2019. PM30664590
21. **Barbaro RP**, Boonstra PS, Kuo KW, Selewski DT, Bailly DK, Stone CL, Chow CY, Annich GM, Moler FW, Paden ML: Evaluating Mortality Risk Adjustment Among Children Receiving Extracorporeal Support for Respiratory Failure. *ASAIO J*.65(3): 277-284, 01/2019. PM29746311
22. **Barbaro R**, Fan E: In Critically Ill Children, Fluid Overload is Consistently Associated with Worse Outcomes. *BMJ Evid Based Med*.24(1): 41-42, 01/2019. PM30065112
23. Yagiela LM, **Barbaro RP**, Quasney MW, Pfarr AM, Ursu DC, Prosser LA, Odetola FO: Outcomes and Patterns of Health Care Utilization After Hospitalization for Pediatric Critical Illness Due to Respiratory Failure. *Pediatr Crit Care Med*.20(2): 120-127, 01/2019. PM30418338
24. Boonstra PS, **Barbaro RP**, Sen A: Default Priors for the Intercept Parameter in Logistic Regressions. *Comput Stat Data Anal*.133: 245-256, 01/2019. PM31530966
25. Broman LM, Taccone FS, Lorusso R, Malfertheiner MV, Pappalardo F, Di Nardo M, Belliato M, Bembea MM, **Barbaro RP**, Diaz R, Grazioli L, Pellegrino V, Mendonca MH, Brodie D, Fan E, Bartlett RH, McMullan MM, Conrad SA: The ELSO Maastricht Treaty for ECLS Nomenclature: Abbreviations for Cannulation Configuration in Extracorporeal Life Support - A Position Paper of the Extracorporeal Life Support Organization. *Crit Care*.23(1)01/2019. PM30736845
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61. Gorga SM\*\*, Sliwiski AL, Sturza J, Carlton EF, **Barbaro RP\*\*\***, Basu RK: Variability in Clinician Awareness of Intravenous Fluid Administration in Critical Illness: A Prospective Cohort Study. *J Pediatr Intensive Care.* 11/2022
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#### **Additional Scholarship:**

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#### **Chapters**

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#### **Non-Peer Reviewed**

##### **Clinical Care Guidelines**

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##### **Correction**

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### Letter

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### Published Erratum

1. Ramanathan K, Shekar K, Ling RR, Barbaro RP, Wong SN, Tan CS, Rochweg B, Fernando SM, Takeda S, MacLaren G, Fan E, Brodie D: Correction to: Extracorporeal membrane oxygenation for COVID-19: A systematic review and meta-analysis. *Crit Care* 25(1):375, 10/2021. PM34706753

### Abstract/Posters

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