

Division Introduction

The Division of Pediatric Critical Care plays a vital role in providing care to critically ill children at Children’s Health™, and is continuously making improvements and innovations to ensure the patient care provided is of the highest quality.

Under the direction of Jessica Moreland, M.D., Division Chief, the Division provides top quality patient care with the most advanced medical technologies in the 44-bed Pediatric Intensive Care Unit (PICU). In addition, the Critical Care faculty, in collaboration with the Division of Pediatric Cardiology and the Heart Center at Children’s Health™, provide state-of-the-art cardiovascular critical care services for children with congenital heart disease as well as other cardiac diseases in the 32-bed Cardiovascular Intensive Care Unit. The Division also provides intensive care in the Children’s Medical Center in Plano in a 12-bed PICU. The Critical Care division also provides consult service to critically ill children in the Burn Unit at Parkland Hospital.



Jessica Moreland, M.D.
Professor, Division Chief

The Division has a long-standing history of clinical, bench, and translational research, with NIH-funded laboratories and regular participation in multi-center clinical trials to advance the care of critically ill children.

Some of the country's brightest pediatric graduates enroll in the Division’s internationally recognized Critical Care Fellowship Program, one of the oldest and largest of its kind in the United States. The fellowship currently includes 13 trainees across three years of training. Teaching fellows, residents, and medical students takes place at the bedside, during lectures, and interactive sessions.

In addition, there is an array of research training opportunities helping fellows learn to ask and answer scientific questions relating to the genetic, molecular, cellular, and physiologic aspects of pediatric critical care medicine.

Faculty

Drs. Anna Silberman and Erin Tresselt joined the Division in 2021, bringing the total to twenty-seven faculty and thirteen fellows.

Anna Silberman, M.D.

Assistant Professor



M.D.

Icahn School of Medicine at Mount Sinai, New York, NY, 2015

Postdoctoral Training

Residency, Pediatrics

Columbia University/ Irving Medical Center, New York, NY, 2015-2018

Fellowship, Pediatric Critical Care

Columbia University/Irving Medical Center, New York, NY 2018-2021

Interests

Medical Education

Erin Tresselt, M.D.

Assistant Professor



M.D.

Texas A&M College of Medicine, College Station, TX, 2015

Postdoctoral Training

Residency, General Pediatrics

University of Texas at Austin Dell Medical School, Austin, TX, 2015-2018

Fellowship, Pediatric Critical Care

UT Southwestern, Dallas, TX 2018-2021

Interests

End organ dysfunction following cardiopulmonary bypass, long term outcomes in patients admitted to the PICU, neurological outcomes following ECMO, QI within Morbidity and Mortality Conference

Honors / Awards

Professor Emeritus

- Julio Pérez Fontán

Best Pediatric Specialists, *D Magazine*

- Cindy Darnell Bowers
- Leslie Garner
- Darryl Miles
- Jessica Moreland
- Maeve Sheehan
- Joshua Wolovits

Texas Rising Stars 2021, *Texas Monthly*

- Erin E. Gordon
- Michael Green (Super Star)
- Olivia L. Hoffman
- Ali McMichael
- Blake Nichols
- Renee Potera

Samuel Z. Davila

- Promoted to Associate Professor

Blake Nichols

- Teacher of the Year – UT Southwestern Pediatric Critical Care Fellowship Program
- Team FIRST Education Award – UT Southwestern Medical Center Quality Enhancement Plan

Erin Tresselt

- Best Research Presentation Award – American Academy of Pediatrics

Priyank Yagnik

- Presidential Citation Award – Society of Critical Care Medicine (SCCM)

Invited Lectures**Ali BV McMichael**

- BloodNET PALISI Webinar, Virtual, April 2021
 - *“Choices of anticoagulation on ECMO”*
- Dept of Peds Research Conference, November 2021
 - *“In Search of the Best Anticoagulant for Pediatric ECMO”*

Jessica Moreland

- Department of Pediatrics Grand Rounds, UT Health San Antonio, San Antonio, TX, October 2021
 - *“The inflammatory balance in critical illness: a driver of organ injury”*
- Texas Society for Critical Care Medicine Symposium, San Antonio, TX, October 2021
 - *“Success in Critical Care Research”*
- Advances in Inflammation Research Symposium, Brown University Alpert Medical School, Providence, RI, October 2021
 - *“Neutrophils in immune homeostasis: NETs, NADPH oxidase, and toll-like receptor signaling”*

Renee Potera

- Pediatric Resident Boot Camp, American Thoracic Society, Virtual, March 2021
 - *“Pediatric ECMO”*

Lakshmi Raman

- Indian ECMO conference Virtual, December 2021
 - *“Pediatric Respiratory ECMO”*
- ELSO Conference, Virtual, September 2021
 - *“Neurological monitoring strategies for early recognition of Brain Injuries”*

Conference Presentations**Critical Care Congress, Virtual, February 2021****Silberman A, Rozenfeld R, Kessler DO**

Poster Presentation, *“Core Components of a Pediatric Critical Care Transport Communication Transport Communication Curriculum; A Modified Delphi”*

Tresselt E

Oral Presentation, *“Using Neutrophil Phenotype to Predict End Organ Dysfunction Following Cardiopulmonary Bypass”*

Pediatric Academic Societies Annual Meeting, Virtual, June 2021**Choi D, Quaney K, McLeroy P, Hoffman OL**

Abstract Presentation, *“Utilization of Pre-ordered Resuscitation Medications in Pediatric Medical-Surgical and Cardiac Intensive Care Units”*

Silberman A, Rozenfeld R, Kessler DO

Poster Presentation, *“Essential Components of a Pediatric Critical Care Transport Communication Curriculum”*

Other Conferences

Butts R, Vinson L, Toombs L, **Hoffman OL**, Bano M, McDermott J, **Wolovits J**, Davies R, Hollander S
The International Society for Heart and Lung Transplantation Annual Meeting, Virtual, April 2021
Poster Presentation, *“Transplant Flight Plan and Huddle: Simple Intervention to Improve Communication in Pediatric Heart Transplantation”*

Davies RR, Arar Y, Pirolli TJ, **Hoffman OL**, Jaquiss RDB
2021 Congenital Heart Surgeons' Society Annual Meeting, Chicago, IL, October 2021
Oral Presentation, *“History of Ductal Stent Is Associated with Pulmonary Artery Interventions After Superior Cavalpulmonary Connections”*

Mowrer M, Shanmugham P, Patrick J, Huang R, **Wolovits J, Hoffman OL**
American Heart Association Quality of Care and Outcomes, Virtual, November 2021
Poster Presentation, *“Implementation of an Electronic Health Record-Based Rounding Checklist in the Pediatric Cardiac Intensive Care Unit”*

Raman L
EuroELSO (Extracorporeal Life Support Organization) Congress, Virtual, May 2021
Presentation, *“Neurological Injury: Can Artificial Intelligence/Machine Learning help predict”*

Silberman A, Genesaw A, Gerrall C, Kerber J, Cheung E
Extracorporeal Life Support Organization (ELSO) Annual Conference, Virtual, October 2021
Poster Presentation, *“Pressure Injuries in a Single-Center Pediatric Extracorporeal Membrane Oxygenation Population”*

Tresselt E
American Academy of Pediatrics National Conference and Exhibition, Virtual, October 2021
Poster Presentation, *“An Innovative and Integrative Approach to Breaking Down Barriers to Traditional Morbidity and Mortality Conference (M&M)”*

Yu P, Skinner M, Rangasamy O, Esangbedo I, Jenks C, Natarajan S, **Raman L**
24th Annual Update on Pediatric and Congenital Cardiovascular Disease, Virtual, February 2021
Presentation, *“Machine Learning to Predict Cardiac Arrest in a Single Center Pediatric Cardiac ICU”*

Education and Training

The educational emphases of the Division of Pediatric Critical Care reflect the diversity of the trainees who rotate through the different PICUs, and conduct research on the delivery of critical care to children. We provide educational opportunities for medical students and pediatric residents in addition to our fully accredited fellowship program. While the major thrusts of educational activities focus on physicians in various stages of training, Division faculty also participate in the education of pediatric nurse practitioners, staff nurses, and respiratory care practitioners.

Medical Students

We offer elective opportunities for fourth-year medical students from UT Southwestern and outside institutions to rotate through our general medical/surgical, trauma/neurosurgical, and cardiac intensive care units. Prerequisites include acceptable academic standing at the student's current medical institution and successful completion of a third-year pediatric clerkship. Outside rotators are required to provide a letter of recommendation from their residency program director confirming that these prerequisites are satisfied.

Medical students who select the PICU to fulfill their acute care rotation requirements are exposed to the full range of patients seen in the different units and participate as integral members of the multidisciplinary team of residents, fellows, and faculty. The rotation emphasizes patient-based learning, with the student taking primary responsibility for one or two patients, and using their illness as a jumping off point for learning that combines both didactic and self-directed study.

Other elective opportunities are available for students interested in learning about critically injured patients in a trauma/neurosurgical setting, or children recovering from cardiovascular surgery to correct congenital or acquired heart disease.

Residents

Pediatric residents rotate through the PICU for one 4-week block during each of their 2nd and 3rd years of residency. This experience exposes residents to a broad spectrum of critically ill children at distinct phases of their training. To enhance this educational experience, our faculty and fellows provide formal didactic teaching on pertinent critical care topics to the pediatric residents during scheduled lectures three days per week.

As they progress from caring for critically ill children for the first time as 2nd year residents to functioning as leaders of the PICU teams as 3rd year providers, the pediatric residents experience both an increasing confidence in their ability to recognize and stabilize a critically ill child and a profound respect for the speed with which illnesses can progress and change the course of a child's and a family's life forever.

Residents from other specialty training programs also rotate through the PICU at varying stages in their training. These include trainees from Emergency Medicine and on an elective basis from Family Medicine, where critical care experience is a valuable adjunct to their education. Their experience is tailored to their educational needs to some degree, but their presence on the PICU teams is enriching for everyone because of the unique perspective they bring from the world of adult medicine.

Fellows

With the objective of providing excellent training in pediatric critical care medicine and preparing individuals to become future leaders in their field, we have trained more than 100 physicians in the art and science of intensive care for critically ill infants and children. Many graduates have become academic leaders within the field, both in the United States and abroad.

Now one of the largest in the United States, the Fellowship Program currently has 13 fellows, and is under the leadership of Dr. Michael L. Green, Program Director, and Dr. Renee Potera, Associate Program Director. Clinical experience includes exposure to a wide spectrum of critical illness in the high-volume general PICU. Fellows aid in the management of trauma and Neurocritical care patients, and have significant exposure to advanced support modalities including ECMO and CRRT. In addition, fellows are a fundamental part of the team in the growing cardiovascular ICU where faculty from divisions of critical care and cardiology guide them in advanced care of cardiovascular critical illness. Intense periods of clinical rotations during the early part of the Fellowship progress to periods of protected time later in fellowship, allowing fellows to carry out a research program developed with the help of faculty both within the Division of Pediatric Critical Care Medicine and in the larger UT Southwestern community. In addition to the clinical and research opportunities, the Fellowship Program has a robust didactic curriculum designed to give fellows a foundational knowledge of the pathophysiology of critical illness. Other highlights include a simulation curriculum and journal club. Our fellows have an excellent success rate on the American Board of Pediatric Critical Care sub-board examination.



Drs. Jessica Moreland, Michael Green, and Fellow Natalia Soulages Arrese

Research Activities

Division research activities are numerous and diverse, with faculty members engaged in bench, translational, and clinical research projects. There are multiple areas of investigation that we are proud to highlight:

- **Cindy Darnell-Bowens** focuses her time on quality initiatives and improving daily care for critically ill children.
- **Erin Gordon** focuses her current research on human milk and feeding experiences; and their potential impact on neurodevelopmental outcomes in those with congenital or acquired heart disease. Dr. Gordon is the medical director of the inpatient developmental care program and directly involved in creating an environment that fosters the growth and development of the congenital heart disease population, including parental mental health and resilience.
- **Peter Luckett's** current research interests include clinical trials in pediatric critical care. He was a founding member and continues to be an active participant of the Pediatric Acute Lung Injury and Sepsis Investigators (PALISI) clinical trials group. The most recently completed work was a NIH funded multicenter randomized clinical trial of tight glucose control in critically ill children (NEJM 376(8) 729-741, 2017). Currently, two NIH funded clinical trials are being conducted in the PICU. The first is a 2x2 factorial trial randomizing conventional mechanical ventilation versus High Frequency Oscillatory Ventilation (HFOV) and prone versus supine position. The second is a prospective longitudinal cohort study of patients undergoing 3 days of ICU care. The aims of this cohort study are to examine outcomes and trajectory of recovery in survivors and to determine the impact of pediatric critical illness on parents and siblings. Dr. Luckett also participated in a scoping review of outcome domains and their measurement. This work recently led to the development of a Core Outcome Set (COS) for pediatric critical care (Critical Care Medicine 48(12): e1313-e1321, 2020)
- **Darryl Miles'** focus is to advance the care of Neurocritical illness in children and learn how the brain responds to injury to better understand what we can do to improve neurologic outcomes. He is the UTSW principal investigator for multi-center studies investigating the Approaches and Decisions After Pediatric Traumatic Brain Injury (ADAPT) and MRI Biomarkers of Long-term Recovery after Childhood TBI. Dr. Miles is currently leading projects using ultrasound and transcranial Doppler technology to noninvasively measure intracranial pathology in brain related injured children, and has an ongoing long-term database describing the genetic and prognostic influencers of recovery after TBI. He is a member of the Center for Cerebrovascular Disorders at Children's Medical Center and the Pediatric Neurocritical Care Research Group.
- **Ali McMichael's** current research focuses on anticoagulation during extracorporeal membrane oxygenation. Her projects include finding the best test for anticoagulation for pediatric patients, identifying risk factors for hemostatic complication during ECMO, and exploring alternative therapies for anticoagulation.
- **Jessica Moreland** focuses her research on better understanding the cell biology of inflammation with a specific interest in neutrophil biology. Her laboratory studies neutrophil priming by infectious and inflammatory stimuli and the role of the NADPH oxidase in pro- and anti-inflammatory signaling. In addition, the laboratory utilizes a murine model of SIRS and multi-organ dysfunction syndrome (MODS).
- **Blake Nichols'** research focus is on curriculum development and process improvement using simulation. His current interests include assessment tool development and longitudinal simulation-based medical education curriculum development using high-fidelity simulation. Dr. Nichols also has an interest in type 1 diabetes and diabetic ketoacidosis. He recently completed a study looking at neutrophil-based inflammation in the development of diabetic ketoacidosis.
- **Alan Poole's** current research areas include studying the impact of COVID-19 and respiratory viruses on pediatric asthma exacerbations, studying glycerol metabolism in non-small cell lung cancer in the laboratory or Ralph Deberardinis, MD, PhD, and participating in quality improvement initiatives to improve timely administration of antibiotics for sepsis in the PICU.
- **Renee Potera's** primary research interest focuses on the acute respiratory distress syndrome and the use of extracorporeal membrane oxygenation in the pediatric intensive care unit.
- **Lakshmi Raman's** interest is in brain injury and the care of ECMO (extracorporeal membrane oxygenation) patients. As the Medical Director of the Extracorporeal Membrane Oxygenation (ECMO) program, Dr. Raman is primarily focused on researching how to evaluate the neurological injury in patients. In collaboration with biomedical engineers, Dr. Raman has leveraged the use of optical monitoring by near infrared spectroscopy and diffuse correlation spectroscopy to study disturbances in cerebral autoregulation in patients undergoing ECMO therapy. The research was previously funded through the American Heart Association and is

currently funded through the Hartwell Foundation. The research has been published in Pediatric Critical Care Medicine. Furthermore, Dr. Raman’s collaboration with Dr. Ann Stowe, who was previously in the neurorepair lab, to study neuroinflammation and autoreactivity to CNS specific antigens, and this was published in critical care medicine. Recently, Dr. Raman has focused her interest on building prediction models, with use of machine learning, through collaboration with bioinformatics both at UTSW and at UTD.

Dr. Raman currently serves as the Chair of the publications committee at the Extracorporeal Life Support Organization (ELSO). In this role, she leads the effort to develop and publish the guidelines covering various aspects of ECMO. These guidelines help clinicians manage patients on ECMO and serve as a reference at the bedside. Furthermore, as a member of the data scientific committee, Dr. Raman collaborates with members of the committee to utilize the ELSO registry database to contribute to advancement of knowledge. As a member of the education committee at ELSO, she works along with an international group of ECMO providers to optimize education across the globe.

Dr. Raman also directs an Education course for ECMO providers that has been endorsed by ELSO. This is a 3- day course that covers various aspects of ECMO physiology and management given by National leaders in the field. The course also has a high-fidelity hands-on simulation for learners.

Clinical Activities

Pediatric Critical Care faculty deliver the highest standard of care for critically ill children. The pediatric intensive care units at Children's Health are primary referral centers for North Central and Northeast Texas. Depending on their diagnoses, critically ill children are assigned to one of four pediatric intensive care units at Children’s, 3 intensive care units on the Dallas Campus and one intensive care unit on the Plano campus. Specialized medical teams assume primary responsibility for their care in one of these units:

- General medical-surgical pediatric intensive care unit (PICU)
- Pediatric trauma-neurologic injury intensive care unit (TICU)
- 32-bed Cardiovascular intensive care unit (CVICU)
- 12-bed PICU (Children’s Medical Center of Plano)



Dr. Jessica Moreland

The Division, in collaboration with the Division of Pediatric Cardiology and the Heart Center, provides state-of-the-art cardiovascular critical care services for children with congenital heart disease as well as other cardiac diseases. More than 2,000 critically ill patients are admitted each year, giving the facility the highest admission rate in the United States.

Patient Statistics (patient days)

Critical Care Patient Stay Duration in Days by Unit/Location by Year

	2017	2018	2019	2020	2021
CVICU	6,590	7,943	9,309	7,507	7,058
PICU	12,025	12,348	15,268	10,875	10,867
Plano Campus	1,734	1,754	2,180	1,223	2,091

Current Grant Support

Cindy Darnell-Bowens

Grantor: Center for Disease Control and Prevention/Boston Children's Hospital
Title of Project: Understanding COVID-19 among critically ill children PALISI Network - Year 2
Role: Principal Investigator
Dates: 05/2021 – 05/2022

Grantor: Center for Disease Control and Prevention/Boston Children's Hospital
Title of Project: Understanding COVID-19 among critically ill children in the Pediatric Acute Lung Injury and Sepsis Investigator's (PALISI) Network
Role: Principal Investigator
Dates: 04/2020 – 05/2022

Samuel Davila

Grantor: NIH-National Inst of Chld Hlth & Hmn Dev/Nationwide Children's Hospital
Title of Project: PediAtric ReseArch of Drugs, Immunoparalysis and Genetics during MODS (PARADIGM)
Role: Principal Investigator
Dates: 05/2020 – 04/2022

Grantor: Harry S. Moss Heart Trust
Title of Project: Real-time Cardiac Physiology modeling to improving interventional outcomes in Pediatric and Congenital Heart Disease
Role: Co- Investigator
Dates: 05/2020 – Current

Erin Gordon

Grantor: Prolacta Bioscience
Title of Project: A Randomized Controlled Trial to Evaluate Growth Velocity
Role: Site Principal Investigator
Dates: 11/2017 – 11/2022

Peter Lockett

Grantor: NIH-National Inst of Chld Hlth & Hmn Dev/University of Pennsylvania
Title of Project: Post-Intensive Care Syndrome Pediatrics, Longitudinal Cohort Study
Role: Principal Investigator
Dates: 07/2020 – 06/2022

Grantor: NIH-National Heart, Lung And Blood/University of Pennsylvania
Title of Project: The PROSpect: Prone and Oscillation Pediatric Clinical Trial Study
Role: Site Principal Investigator
Dates: 06/2018 – 07/2024

Ali McMichael

Grantor: Extracorporeal Life Support Organization
Title of Project: Defects of Primary Hemostasis during Extracorporeal Life Support and the Impact on Bleeding Complications and Blood Product Transfusions
Role: Co-Investigator
Dates: 01/2020 – 12/2022

Grantor: NIH-National Inst Of Chld Hlth & Hmn Dev/ Duke Clinical Research Institute
Title of Project: Pharmacokinetics, Pharmacodynamics, and Safety Profile of Understudied Drugs Administered to Children per Standard of Care (POPS)
Role: Principal Investigator
Dates: 12/2020 – 09/2023

Grantor: NIH-National Inst Of Chld Hlth & Hmn Dev/ Duke Clinical Research Institute
Title of Project: Pharmacokinetics, Pharmacodynamics, and Safety Profile of Understudied Drugs Administered to Children per Standard of Care (POPS) – COVID Severe Pediatric Brain Injury
Role: Principal Investigator
Dates: 12/2020 – 09/2022

Grantor: CCRAC (Children’s Clinical Research Advisory Committee) Early Center
Title of Project: Prospective Randomized Pilot Study Comparing Bivalirudin Versus Heparin in Neonatal and Pediatric Extracorporeal Membrane Oxygenation
Role: Site Principal Investigator
Dates: 08/2019 – 07/2022

Darryl Miles

Grantor: National Institute of Neurological Disorders and Stroke
Title of Project: Genetic and Environmental Influences on Recovery of Severe Pediatric Brain Injury
Role: Site Principal Investigator
Dates: 08/2016 – 04/2021

Renee Potera

Grantor: NIH-National Heart, Lung and Blood Inst/University of Michigan
Title of Project: ASCEND (ARDS in Children and ECMO initiation strategies impact on Neuro-Development)
Role: Site Principal Investigator
Dates: 09/2020 – 06/2025

Lakshmi Raman

Grantor: Extracorporeal Life Support Organization
Title of Project: Prospective, Blinded Analysis of Bivalirudin Versus Heparin Anticoagulation for Neonatal and Pediatric Extracorporeal Membrane Oxygenation
Role: Principal Investigator
Dates: 05/2018 – 06/2022

Grantor: Extracorporeal Life Support Organization
Title of Project: Defects of Primary Hemostasis during Extracorporeal Life Support and the Impact on Bleeding
Role: Principal Investigator
Dates: 01/2020 – 12/2022

Grantor: Extracorporeal Life Support Organization
Title of Project: Evaluation of Cerebral Blood Flow Differences in Venoarterial versus Venovenous ECMO Using Diffusion Correlation Spectroscopy
Role: Principal Investigator
Dates: 02/2020 – 01/2022

Grantor: Extracorporeal Life Support Organization
Title of Project: Prospective Use of Continuous EEG in Pediatric ECMO for Neuromonitoring and Predictive Value of Neurodevelopmental Outcomes
Role: Principal Investigator
Dates: 01/2021 – 12/2021

Grantor: Extracorporeal Life Support Organization
Title of Project: Can PreECLS factors predict risk of neurological injury on ECMO?
Role: Principal Investigator
Dates: 01/2021 – 12/2021

Grantor: Extracorporeal Life Support Organization
Title of Project: Hematology and Oncology Patients on ECMO (HOPE)
Role: Principal Investigator
Dates: 12/2020 – 11/2022

Grantor: Children's Healthcare of Atlanta Inc
Title of Project: A pilot study: an in vitro analysis of clot burden in ECMO circuits anticoagulated with heparin or bivalirudin
Role: Principal Investigator
Dates: 01/2021 – 08/2021

Grantor: NIH-National Heart, Lung and Blood Inst/University of Michigan
Title of Project: ASCEND (ARDS in Children and ECMO initiation strategies impact on Neuro-Development)
Role: Co-Investigator
Dates: 09/2020 – 06/2025

Grantor: Children's Clinical Research Advisory Committee (CCRAC)
Title of Project: Center for Monitoring Cerebral Blood Flow Autoregulation to Prevent Brain Injury During Extracorporeal Life Support
Role: Research Mentor (Fellow-Abdelaziz Farhat)
Dates: 02/2020 – 01/2021

Grantor: Hartwell Foundation
Title of Project: Individual Biomedical Research Award, The Hartwell Foundation. Center for Monitoring Cerebral Blood Flow Autoregulation to Prevent Brain Injury During Extracorporeal Life Support
Role: Collaborator
Dates: 07/2019 – 06/2022

Josh Wolovits

Grantor: NIH
Title of Project: Steroids to reduce inflammation in neonatal cardiac surgery
Role: Site Co-Investigator
Dates: 10/2017 - 07/2021

Grantor: Prolacta Bioscience
Title of Project: A Randomized Controlled Trial to Evaluate Growth Velocity and Clinical Outcomes of Infants with Single Ventricle 5 Physiology Fed an Exclusive Human Milk Diet with Early Nutritional Fortification Following Surgical Repair
Role: Site Co-Investigator
Dates: 11/2017 – 11/2022

Priscilla Yu

Grantor: Zoll Medical Corporation/Children's Hospital of Philadelphia
Title of Project: Yu_CHOP_Pediatric RESuscitation Quality (pedRES-Q) Collaborative- 07.01.20 - 06.30.20
Role: Principal Investigator
Dates: 07/2020 – 06/2023

Peer-Reviewed Publications

1. Anton-Martin P, Quigley R, **Dhar A, Bhaskar P**, Modem V. [Early Fluid Accumulation and Intensive Care Unit Mortality in Children Receiving Extracorporeal Membrane Oxygenation](#). *ASAIO J*. 2021 Jan 1;67(1):84-90. PMID:32433305
2. Badulak J, Antonini MV, Stead CM, Shekerdemian L, **Raman L**, Paden ML, Agerstrand C, Bartlett RH, Barrett N, Combes A, Lorusso R, Mueller T, Ogino MT, Peek G, Pellegrino V, Rabie AA, Salazar L, Schmidt M, Shekar K, MacLaren G, Brodie D, ELSO COVID-19 Working Group Members. [Extracorporeal Membrane Oxygenation for COVID-19: Updated 2021 Guidelines from the Extracorporeal Life Support Organization](#). *ASAIO J*. 2021 May 1;67(5):485-495. PMID:33657573
3. Beauchamp, D; Heid, C; Herbert, C; Timmons, C; **Green, M**; Wait M; Pirolli, T. [Metastatic Signet Ring Cell Carcinoma Masquerading as Acute on Chronic Thromboembolic Pulmonary Hypertension Requiring ECMO](#) *The Journal of Heart and Lung Transplantation*. 2021 Apr;40(4):S467.
4. **Bhaskar P, Davila S**, Hoskote A, Thiagarajan R. [Use of ECMO for Cardiogenic Shock in Pediatric Population](#). *J Clin Med*. 2021 Apr 8;10(8):. PMID:33917910
5. Bridges BC, Kilbaugh TJ, Barbaro RP, Bembea MM, Chima RS, **Potera RM**, Rosner EA, Sandhu HS, Slaven JE, Tarquinio KM, Cheifetz IM, Rowan CM, Friedman ML, Pediatric ECMO (Pedicmo) Subgroup of the Pediatric Acute Lung Injury and Sepsis Investigators (PALISI) Network and the Extracorporeal Life Support Organization (ELSO). [Veno-Venous Extracorporeal Membrane Oxygenation for Children With Cancer or Hematopoietic Cell Transplant: A Ten Center Cohort](#). *ASAIO J*. 2021 Aug 1;67(8):923-929. PMID:33606393
6. Brown G, Moynihan KM, Deatrck KB, Hoskote A, Sandhu HS, Aganga D, Deshpande SR, Menon AP, Rozen T, **Raman L**, Alexander PMA. [Extracorporeal Life Support Organization \(ELSO\): Guidelines for Pediatric Cardiac Failure](#). *ASAIO J*. 2021 May 1;67(5):463-475. PMID:33788796
7. Chamblee TB, **Miles DK**. [A Prospective Study of Family Engagement for Prevention of Central Line-associated Blood Stream Infections](#). *Pediatr Qual Saf*. 2021 Sep-Oct;6(5):e467. PMID:34476318
8. Chamblee TB, Patton LJ, Young VB, Marusich J, **Bowens CD, Miles DK**. [Reducing central line-associated bloodstream infection in contaminated central venous catheters: case studies of a pediatric contamination guideline](#). *Br J Nurs*. 2021 Oct 28;30(19):S24-S29. PMID:34723656
9. Donda K, Agyemang CO, Adjetey NA, Agyekum A, Princewill N, Ayensu M, Bray L, **Yagnik PJ**, Bhatt P, Dapaah-Siakwan F. [Tracheostomy trends in preterm infants with bronchopulmonary dysplasia in the United States: 2008-2017](#). *Pediatr Pulmonol*. 2021 May;56(5):1008-1017. PMID:33524218
10. **Efune PN**, Alex G, Mehta SD. [Emergency Sugammadex Reversal in an 850-G Premature Infant: A Case Report](#). *J Pediatr Pharmacol Ther*. 2021;26(1):107-110. PMID:33424509
11. Farhat A, Ling RR, Jenks CL, Poon WH, Yang IX, Li X, Liu Y, **Darnell-Bowens C**, Ramanathan K, Thiagarajan RR, **Raman L**. [Outcomes of Pediatric Extracorporeal Cardiopulmonary Resuscitation: A Systematic Review and Meta-Analysis](#). *Crit Care Med*. 2021 Apr 1;49(4):682-692. PMID:33591019

12. Feldstein LR, Tenforde MW, Friedman KG, Newhams M, Rose EB, Dapul H, Soma VL, Maddux AB, Mourani PM, **Bowens C, Maamari M**, Hall MW, Riggs BJ, Giuliano JS Jr, Singh AR, Li S, Kong M, Schuster JE, McLaughlin GE, Schwartz SP, Walker TC, Loftis LL, Hobbs CV, Halasa NB, Doymaz S, Babbitt CJ, Hume JR, Gertz SJ, Irby K, Clouser KN, Cvijanovich NZ, Bradford TT, Smith LS, Heidemann SM, Zackai SP, Wellnitz K, Nofziger RA, Horwitz SM, Carroll RW, Rowan CM, Tarquinio KM, Mack EH, Fitzgerald JC, Coates BM, Jackson AM, Young CC, Son MBF, Patel MM, Newburger JW, Randolph AG, Overcoming COVID-19 Investigators. [Characteristics and Outcomes of US Children and Adolescents With Multisystem Inflammatory Syndrome in Children \(MIS-C\) Compared With Severe Acute COVID-19](#). *JAMA*. 2021 Mar 16;325(11):1074-1087. PMID:33625505
13. Geva A, Patel MM, Newhams MM, Young CC, Son MBF, Kong M, Maddux AB, Hall MW, Riggs BJ, Singh AR, Giuliano JS, Hobbs CV, Loftis LL, McLaughlin GE, Schwartz SP, Schuster JE, Babbitt CJ, Halasa NB, Gertz SJ, Doymaz S, Hume JR, Bradford TT, Irby K, Carroll CL, McGuire JK, Tarquinio KM, Rowan CM, Mack EH, Cvijanovich NZ, Fitzgerald JC, Spinella PC, Staat MA, Clouser KN, Soma VL, Dapul H, **Maamari M, Bowens C**, Havlin KM, Mourani PM, Heidemann SM, Horwitz SM, Feldstein LR, Tenforde MW, Newburger JW, Mandl KD, Randolph AG, Overcoming COVID-19 Investigators. [Data-driven clustering identifies features distinguishing multisystem inflammatory syndrome from acute COVID-19 in children and adolescents](#). *EClinicalMedicine*. 2021 Oct;40():101112. PMID:34485878
14. Ghafoor S, Fan K, Di Nardo M, Talleur AC, Saini A, **Potera RM**, Lehmann L, Annich G, Wang F, McArthur J, Sandhu H. [Extracorporeal Membrane Oxygenation Candidacy in Pediatric Patients Treated With Hematopoietic Stem Cell Transplant and Chimeric Antigen Receptor T-Cell Therapy: An International Survey](#). *Front Oncol*. 2021;11():798236. PMID:35004323
15. Ginsburg S, Conlon T, Himebauch A, Glau C, Weiss S, Weber MD, O'Connor MJ, Nishisaki A. [Left Ventricular Diastolic Dysfunction in Pediatric Sepsis: Outcomes in a Single-Center Retrospective Cohort Study](#). *Pediatr Crit Care Med*. 2021 Mar 1;22(3):275-285. PMID:33534389
16. Grabinski ZG, Babineau J, Jamal N, **Silberman AP**, Dufault J, Ford BL, Kessler DO. [Reporting of Unsafe Conditions at an Academic Women and Children's Hospital](#). *Jt Comm J Qual Patient Saf*. 2021 Nov;47(11):731-738. PMID:34544657
17. Guerguerian AM, Sano M, Todd M, Honjo O, Alexander P, **Raman L**. [Pediatric Extracorporeal Cardiopulmonary Resuscitation ELSO Guidelines](#). *ASAIO J*. 2021 Mar 1;67(3):229-237. PMID:33627593
18. Hamilton CE, Su E, Tawfik D, Fernandez E, Vetten A, Conlon T, Ginsburg S, Mariano K, Sidell D, Haileselassie B, Pediatric Research Collaborative on Critical Ultrasound (PeRCCUS). [Assessment of Vocal Cord Motion Using Laryngeal Ultrasound in Children: A Systematic Review and Meta-Analysis](#). *Pediatr Crit Care Med*. 2021 Oct 1;22(10):e532-e539. PMID:33833204
19. Hirshberg EL, Alexander JL, Asaro LA, Coughlin-Wells K, Steil GM, Spear D, Stone C, Nadkarni VM, Agus MSD, HALF-PINT Study Investigators. [Performance of an Electronic Decision Support System as a Therapeutic Intervention During a Multicenter PICU Clinical Trial: Heart and Lung Failure-Pediatric Insulin Titration Trial \(HALF-PINT\)](#). *Chest*. 2021 Sep;160(3):919-928. PMID:33932465
20. Hook JS, Patel PA, O'Malley A, Xie L, Kavanaugh JS, Horswill AR, **Moreland JG**. [Lipoproteins from *Staphylococcus aureus* Drive Neutrophil Extracellular Trap Formation in a TLR2/1- and PAD-Dependent Manner](#). *J Immunol*. 2021 Aug 1;207(3):966-973. PMID:34290104

21. Hook JS, Patel PA, O'Malley A, Xie L, Kavanaugh JS, Horswill AR, and **Moreland**, JG. [Lipoproteins from Staphylococcus aureus Drive Neutrophil Extracellular Trap Formation in a TLR2/1- and PAD-Dependent Manner](#) *The Journal of Immunology*. 2021 Aug 1;207(3):966-973.
22. Jenks C, **Raman L**, **Dhar A**. [Review of acute kidney injury and continuous renal replacement therapy in pediatric extracorporeal membrane oxygenation](#). *Indian J Thorac Cardiovasc Surg*. 2021 Apr;37(Suppl 2):254-260. PMID:33967449
23. Kopp W, Gedeit RG, Asaro LA, McLaughlin GE, Wypij D, Curley MAQ, Randomized Evaluation of Sedation Titration for Respiratory Failure (RESTORE) Study Investigators. [The Impact of Preintubation Noninvasive Ventilation on Outcomes in Pediatric Acute Respiratory Distress Syndrome](#). *Crit Care Med*. 2021 May 1;49(5):816-827. PMID:33590999
24. LaRovere KL, Riggs BJ, Poussaint TY, Young CC, Newhams MM, **Maamari M**, Walker TC, Singh AR, Dapul H, Hobbs CV, McLaughlin GE, Son MBF, Maddux AB, Clouser KN, Rowan CM, McGuire JK, Fitzgerald JC, Gertz SJ, Shein SL, Munoz AC, Thomas NJ, Irby K, Levy ER, Staat MA, Tenforde MW, Feldstein LR, Halasa NB, Giuliano JS Jr, Hall MW, Kong M, Carroll CL, Schuster JE, Doymaz S, Loftis LL, Tarquinio KM, Babbitt CJ, Nofziger RA, Kleinman LC, Keenaghan MA, Cvijanovich NZ, Spinella PC, Hume JR, Wellnitz K, Mack EH, Michelson KN, Flori HR, Patel MM, Randolph AG, Overcoming COVID-19 Investigators. [Neurologic Involvement in Children and Adolescents Hospitalized in the United States for COVID-19 or Multisystem Inflammatory Syndrome](#). *JAMA Neurol*. 2021 May 1;78(5):536-547. PMID:33666649
25. Lin JC, Barron LM, Vogel AM, Colvin RM, **Baltagi SA**, Doctor A, Gazit AZ, Mehegan M, O'Connor N, Said AS, Shepard M, Wallendorf M, Spinella PC. [Context-Responsive Anticoagulation Reduces Complications in Pediatric Extracorporeal Membrane Oxygenation](#). *Front Cardiovasc Med*. 2021;8():637106. PMID:34179125
26. Mallory PP, Barbaro RP, Bembea MM, Bridges BC, Chima RS, Kilbaugh TJ, **Potera RM**, Rosner EA, Sandhu HS, Slaven JE, Tarquinio KM, Cheifetz IM, Friedman ML. [Tracheostomy and long-term mechanical ventilation in children after veno-venous extracorporeal membrane oxygenation](#). *Pediatr Pulmonol*. 2021 Sep;56(9):3005-3012. PMID:34156159
27. McGetrick ME, Varughese NA, **Miles DK**, Wang CX, McCreary M, Monson NL, Greenberg BM. [Clinical Features, Treatment Strategies, and Outcomes in Hospitalized Children With Immune-Mediated Encephalopathies](#). *Pediatr Neurol*. 2021 Mar;116():20-26. PMID:33388545
28. **McMichael ABV**, Zimmerman KO, Kumar KR, Ozment CP. [Evaluation of effect of scheduled fresh frozen plasma on ECMO circuit life: A randomized pilot trial](#). *Transfusion*. 2021 Jan;61(1):42-51. PMID:33269487
29. Michael M, Griggs AC, Shields IH, Sadighi M, Hernandez J, Chan C, McHugh M, **Nichols BE**, Joshi K, Testa D, Raj S, Preble R, Lazzara EH, Greilich PE. [Improving handover competency in preclinical medical and health professions students: establishing the reliability and construct validity of an assessment instrument](#). *BMC Med Educ*. 2021 Oct 2;21(1):518. PMID:34600497
30. Monteiro ACC, Flori H, Dahmer MK, Sim MS, Quasney MW, Curley MAQ, Matthay MA, Sapru A, BALI Study Investigators of the Pediatric Acute Lung Injury and Sepsis Investigators (PALISI) Network. [Thrombomodulin is associated with increased mortality and organ failure in mechanically ventilated children with acute respiratory failure: biomarker analysis from a multicenter randomized controlled trial](#). *Crit Care*. 2021 Aug 3;25(1):271. PMID:34344416

31. Natale JE, Asaro LA, Joseph JG, Ulysse C, Ascenzi J, **Bowens C**, Wypij D, Curley MAQ, RESTORE Study Investigators. [Association of Race and Ethnicity with Sedation Management in Pediatric Intensive Care](#). *Ann Am Thorac Soc*. 2021 Jan;18(1):93-102. PMID:32776853
32. **Nichols BE, McMichael ABV, Volk APD, Bhaskar P, Bowens CD**. [CPR during COVID-19: Use of Expert-driven Rapid Cycle Deliberate Practice to Implement PALS Guidelines](#). *Pediatr Qual Saf*. 2021 Jan-Feb;6(1):e374. PMID:33403320
33. **Nichols BE, McMichael ABV**, Ambardekar AP. [Content Evidence for Validity of Time-to-Task Initiation: A Novel Measure of Learner Competence](#). *Simul Healthc*. 2021 Dec 1;16(6):e194-e199. PMID:33370084
34. O'Brien NF, Reuter-Rice K, Wainwright MS, Kaplan SL, Appavu B, Erklauer JC, Ghosh S, Kirschen M, Kozak B, Lidsky K, Lovett ME, Mehollin-Ray AR, **Miles DK**, Press CA, Simon DW, Tasker RC, LaRovere KL. [Practice Recommendations for Transcranial Doppler Ultrasonography in Critically Ill Children in the Pediatric Intensive Care Unit: A Multidisciplinary Expert Consensus Statement](#). *J Pediatr Intensive Care*. 2021 Jun;10(2):133-142. PMID:33884214
35. Richardson ASC, Tonna JE, Nanjaya V, Nixon P, Abrams DC, **Raman L**, Bernard S, Finney SJ, Grunau B, Youngquist ST, McKellar SH, Shinar Z, Bartos JA, Becker LB, Yannopoulos D, B'elohlávek J, Lamhaut L, Pellegrino V. [Extracorporeal Cardiopulmonary Resuscitation in Adults. Interim Guideline Consensus Statement From the Extracorporeal Life Support Organization](#). *ASAIO J*. 2021 Mar 1;67(3):221-228. PMID:33627592
36. Saynhalath R, Alex G, **Efune PN**, Szmuk P, Zhu H, Sanford EL. [Anesthetic Complications Associated With Severe Acute Respiratory Syndrome Coronavirus 2 in Pediatric Patients](#). *Anesth Analg*. 2021 Aug 1;133(2):483-490. PMID:33886516
37. Shaikh N, Umscheid J, Rizvi S, Bhatt P, Vasudeva R, **Yagnik P**, Bhatt N, Donda K, Dapaah-Siakwan F. [National Trends of Acute Osteomyelitis and Peripherally Inserted Central Catheters in Children](#). *Hosp Pediatr*. 2021 Jul;11(7):662-670. PMID:34187789
38. Sochet AA, Nunez M, **Maamari M**, McKinley S, Morrison JM, Nakagawa TA. [Physiometric Response to High-Flow Nasal Cannula Support in Acute Bronchiolitis](#). *Hosp Pediatr*. 2021 Jan;11(1):94-99. PMID:33372047
39. Son MFB, Murray N, Friedman K, Young CC, Newhams MM, Feldstein LR, Loftis LL, Tarquinio KM, Singh AR, Heidemann SM, Soma VL, Riggs BJ, Fitzgerald JC, Kong M, Doymaz S, Giuliano JS Jr, Keenaghan MA, Hume JR, Hobbs CV, Schuster JE, Clouser KN, Hall MW, Smith LS, Horwitz SM, Schwartz SP, Irby K, Bradford TT, Maddux AB, Babbitt CJ, Rowan CM, McLaughlin GE, Yager PH, **Maamari M**, Mack EH, Carroll CL, Montgomery VL, Halasa NB, Cvijanovich NZ, Coates BM, Rose CE, Newburger JW, Patel MM, Randolph AG, Overcoming COVID-19 Investigators. [Multisystem Inflammatory Syndrome in Children - Initial Therapy and Outcomes](#). *N Engl J Med*. 2021 Jul 1;385(1):23-34. PMID:34133855
40. Tonna JE, Barbaro RP, Rycus PT, Wall N, **Raman L**, Nasr VG, Paden ML, Thiagarajan RR, Dalton H, Conrad SA, Bartlett RH, Toomasian JM, Alexander PMA. [On the Academic Value of 30 Years of the Extracorporeal Life Support Organization Registry](#). *ASAIO J*. 2021 Jan 1;67(1):1/3/2022. PMID:33196480
41. Vasudeva R, Bhatt P, Lilje C, Desai P, Amponsah J, Umscheid J, Parmar N, Bhatt N, Adupa R, Pagad S, Agrawal P, Donda K, Dapaah-Siakwan F, **Yagnik P**. [Trends in Acute Myocarditis Related Pediatric Hospitalizations in the United States, 2007-2016](#). *Am J Cardiol*. 2021 Jun 15;149():95-102. PMID:33757784

Book Chapters

1. Frank G, Morse RB, Efune P, Chanani NK, **Bowens CD, Wolovits J.** (2021) Bundles and Checklists. In: Shah, RK & Godambe, SA (Eds.), *Patient Safety and Quality Improvement in Healthcare* (pp. 231-244) Switzerland AG, Springer Nature