

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 12 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

Dr. Sirine Baltagi joined the Division in 2020, bringing the total to twenty-six faculty and twelve fellows.

Sirine Baltagi, M.D. FAAP

Assistant Professor



B.S., Bachelor of Science- Biology

American University of Beirut, Beirut, Lebanon, 2000

M.D.

American University of Beirut, Beirut, Lebanon, 2004

Postdoctoral Training

Residency, Pediatrics

Cleveland Clinic Children’s Hospital, Cleveland, OH, 2005-2008

Fellowship, Pediatric Critical Care

University of Pittsburgh, Pittsburgh, PA 2008-2011

Fellowship, Cardiac Critical Care

Boston Children’s Hospital Children’s Hospital, Boston, MA, 2011-2012

Interests

Critical Illness Coagulopathy, Heart Failure, Mechanical Assist Devices

Honors / Awards

Best Pediatric Specialists, *D Magazine*

- Cindy Darnell Bowens
- Archana Dhar
- Leslie Garner
- Jessica Moreland
- Joshua Wolovits

Texas Rising Stars 2020, *Texas Monthly*

- Erin E. Gordon
- Michael Green
- Ali McMichael
- Renee Potera

Julio Pérez Fontán

Named as Associate Dean for Clinical Faculty Development

Michael Green

- Association of Pediatric Program Directors Leadership in Educational Academic Development (LEAD)

Mia Maamari

- Star Research Presentation - One of 64 top-scoring abstracts for Society of Critical Care Medicine

Alan Poole

- Promoted to Assistant Professor

Joshua Wolovits

- Promoted to Associate Professor

Invited Lectures

Darryl Miles

- American Society of Neuroimaging National Meeting, Atlanta, GA, 2020
 - *"Pro/Con Debate: Emerging Clinical Application for Transcranial Doppler Ultrasound in Pediatric Critical Care"*

Lakshmi Raman

- South West Asian and Africa Conference ELSO, Johannesburg, South Africa, 2020
 - *"Neurological Injury on ECMO"*
 - *"Guidelines & Protocols ELSO"*
 - *"Anticoagulation targets and point of care anticoagulation testing"*
- ESPNIC Webinar April 2020
 - *"The US experience and the role of ELSO organization in the current COVID-19 pandemic in developing pediatric ECMO guidelines"*

- Congenital Heart Academy June 2020
 - *“Neuromonitoring and Neuroprotection on ECMO”*
- ELSO virtual meeting in Sep 2020
 - Moderator: *“Research Grant presentation- September 25th, 2:30 – 3:00 p.m.”*
 - *“Bivalirudin is the way to go: September 26th, 1:30 to 1:45 p.m.”*
 - *“What’s New in ELSO guidelines: What’s the process: September 26th, 3:45-3:55 p.m.”*

Conference Presentations

Critical Care Congress, Orlando, FL, February 2020

Esangbedo I, Byrnes J, Brandewie K, Ebraheem M, Zhang S, **Priscilla Y**

Poster, *“Does Systolic Dysfunction Influence Peri-Intubation Cardiac Arrest in the Pediatric Cardiac ICU?”*

Lauridsen K, Lasa J, Raymond T, **Yu P**, Niles D, Sutton R, Morgan R, Berg R, Griffis H, Hanna R, Zhang X, Nadkarni, V.

Poster, *“Chest Compression Pauses During Pediatric eCPR Cannulation?”*

Other Conferences

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 12 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.



Senior Fellows Research Day
Dr. Stephanie Hsu and Michael Green

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** focuses her time on quality initiatives and improving daily care for critically ill children.
- **Erin Gordon** focuses her current research on breast milk (donor or maternal) and neurodevelopmental outcomes in those with congenital or acquired heart disease. Dr. Gordon is the primary UTSW investigator for a multi-center industrial study evaluating the growth velocity and clinical outcomes of infants with single ventricle physiology fed an exclusive human milk diet with early nutritional fortification following surgical repair.
- **Peter Luckett's** current research interests include clinical trials in pediatric critical care. In 2002, he was an initial organizing member of the Pediatric Acute Lung Injury and Sepsis Investigators (PALISI) clinical trials group, which recently completed a collaboration with members of the Acute Respiratory Distress Syndrome Network (ARDSnet) as part of the NIH Roadmap contract mechanism entitled "Reengineering Clinical Research in Critical Care." Dr. Luckett continues to focus on review of pediatric critical care long term outcomes; the prevalence of acute rehab in kids in the PICU and observation of a Multi-Center Quality Improvement Project titled, "*Improving Safety and Quality of Tracheal Intubation Practice in Pediatric ICUs and Pediatric EDs, NICUs.*"
- **Darryl Miles's** 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).
- **Dr. Blake Nichols's** 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 is completing a study looking at neutrophil-based inflammation in the development of diabetic ketoacidosis.
- **Alan Poole's** current research focuses on Glycerol Metabolism in Non-Small Cell Lung Cancer in the Laboratory of Ralph DeBerardinis, MD, PhD.
- **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 is collaborating 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 in 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. 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 together with an international group of ECMO providers to optimize education across the globe.

- **Lakshmi Raman** and **Darryl Miles**, in collaboration with Dr. Ann Stowe, have received a grant from the Texas Institute of Brain Injury and Repair (TIBIR) studying the effects of cerebral perfusion pressure in severe traumatic brain injury on central nervous system inflammation after pediatric TBI.
- **Ivie Esangbedo** is the Principal Investigator for a multi-center retrospective cohort study ("Risk Factors for Peri-Intubation Cardiac Arrest in Pediatric Cardiac Intensive Care Patients"). The study now has four sites enrolled: UT Southwestern, Cincinnati Children's, University of Florida Gainesville and University of Alabama (UAB). The first manuscript from this study was published in Pediatric Critical Care Medicine in 2020, and the second manuscript is currently in data analysis. Dr. Esangbedo is also P.I. for a single center retrospective study reviewing ICU emergencies in our cohort of patients with ventricular assist devices (VADs), and in addition is conducting a national cross-sectional survey of cardiac ICU faculty regarding VAD expertise and VAD emergencies. Additionally, Dr. Esangbedo and Dr. Priscilla Yu are the site co-investigators for the pediRESQ collaborative (Pediatric Resuscitation Quality Collaborative), which is an international collaborative of nearly 50 children's hospitals that collects data on and studies pediatric in-hospital cardiac arrest. There are several ongoing research studies being done by pediRESQ investigators, and Dr. Esangbedo presented on the relationship between near infrared spectroscopy (NIRS) and return of spontaneous circulation (ROSC) at AHA's Resuscitation Science Symposium (ReSS) in November 2020.

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
CVICU	6,590	7,943	9,309	7,507
PICU	12,025	12,348	15,268	10,875
Plano Campus	1,734	1,754	2,180	1,223

Current Grant Support

Cindy Darnell-Bowens

Grantor: Center for Disease Control and Prevention
Title of Project: Influenza and Other Emerging Respiratory Pathogens Surveillance Registry
Role: Site Principal Investigator
Dates: 06/2020 – 10/2021

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 Luckett

Grantor: University of Pennsylvania (Per Dr. Luckett: The Grantor is actually NIH with the PI at Penn.)
Title of Project: The PROSpect: Prone and Oscillation Pediatric Clinical Trial Study
Role: Site Principal Investigator
Dates: 06/2018 – 07/2024

Ali McMichael

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 – 08/2021

Darryl Miles

Grantor: Cincinnati Children's Hospital Medical Center
Title of Project: Adapt Genetic and Environmental Influences on Recovery of Severe Pediatric Brain Injury - Year 2
Role: Site Principal Investigator
Dates: 05/2017 – 04/2020

Grantor: University of Wisconsin - Madison
Title of Project: Magnetic Resonance Imaging (MRI) Markers of Outcome after Severe Pediatric Traumatic Brain Injury (TBI)
Role: Site Principal Investigator
Dates: 04/2016 – 03/2020

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

Julio Pérez Fontán

Grantor: NICHD K12 HD068369-07 (Child Health Research Career Development Award)

Title of Project: Antecedents Sequelae of Childhood Onset Disease

Role: Principal Investigator

Dates: 02/2016 – 11/2020

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: Faculty Mentor (Fellow: Jamie Weller)

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: Faculty Mentor (Fellow: Mowrer)

Dates: 01/2020 – 12/2022

Grantor: Extracorporeal Life Support Organization

Title of Project: Evaluation of Cerebral Blood Flow Differences in Venous versus Venovenous ECMO Using Diffusion Correlation Spectroscopy

Role: Faculty Mentor (Sanford)

Dates: 02/2020 – 01/2022

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: Children's Hospital of Philadelphia

Title of Project: Pediatric Resuscitation Quality

Role: Principal Investigator

Dates: 07/2017 – 06/2020

Peer-Reviewed Publications

1. Aldy K, Cao DJ, **McGetrick M**, Willcutts D, Verbeck G, De Silva I, **Hsu S**. [Severe E-Cigarette, or Vaping, Product Use Associated Lung Injury Requiring Venovenous Extracorporeal Membrane Oxygenation](#). *Pediatr Crit Care Med*. 2020 Apr;21(4):385-388. PMID:32150124
2. Anton-Martin P, Moreira A, Kang P, **Green ML**. [Outcomes of paediatric cardiac patients after 30 minutes of cardiopulmonary resuscitation prior to extracorporeal support](#). *Cardiol Young*. 2020 May;30(5):607-616. PMID:32228742
3. Badheka A, **Yu P**, Mille F, Durbin D, Elci O, Blinder J. [Red cell transfusion practices after stage 1 palliation: a survey of practitioners from the Pediatric Cardiac Intensive Care Society](#). *Cardiol Young*. 2019 Dec;29(12):1452-1458. PMID:31722769
4. Bartlett RH, Ogino MT, Brodie D, McMullan DM, Lorusso R, MacLaren G, Stead CM, Rycus P, Fraser JF, Belohlavek J, Salazar L, Mehta Y, **Raman L**, Paden ML. [Initial ELSO Guidance Document: ECMO for COVID-19 Patients with Severe Cardiopulmonary Failure](#). *ASAIO J*. 2020 May;66(5):472-474. PMID:32243267
5. **Bhaskar P**, Rettiganti M, Sadot E, Paul T, Garros D, Frankel LR, Reemtsen B, Butt W, Gupta P. [An International Survey Comparing Different Physician Models for Health Care Delivery to Critically Ill Children With Heart Disease](#). *Pediatr Crit Care Med*. 2020 May;21(5):415-422. PMID:32365284
6. Biagas KV, Hinton VJ, Hasbani NR, **Luckett PM**, Wypij D, Nadkarni VM, Agus MSD, HALF-PINT trial study investigators., PALISI Network, [Long-Term Neurobehavioral and Quality of Life Outcomes of Critically Ill Children after Glycemic Control](#). *J Pediatr*. 2020 Mar;218():57-63.e5. PMID:31910992
7. Cao DJ, Aldy K, **Hsu S**, **McGetrick M**, Verbeck G, De Silva I, Feng SY. [Review of Health Consequences of Electronic Cigarettes and the Outbreak of Electronic Cigarette, or Vaping, Product Use-Associated Lung Injury](#). *J Med Toxicol*. 2020 Jul;16(3):295-310. PMID:32301069
8. Chlebowski MM, **Baltagi S**, Carlson M, Levy JH, Spinella PC. [Clinical controversies in anticoagulation monitoring and antithrombin supplementation for ECMO](#). *Crit Care*. 2020 Jan 20;24(1):19. PMID:31959232
9. Dahmer MK, Flori H, Sapru A, Kohne J, Weeks HM, Curley MAQ, Matthay MA, Quasney MW, BALI and RESTORE Study Investigators and Pediatric Acute Lung Injury and Sepsis Investigators (PALISI) Network., [Surfactant Protein D Is Associated With Severe Pediatric ARDS, Prolonged Ventilation, and Death in Children With Acute Respiratory Failure](#). *Chest*. 2020 Sep;158(3):1027-1035. PMID:32275979
10. **Dhar AV**, Huang CJ, Sue PK, Patel K, Farrow-Gillespie AC, Hammer MR, Zia AN, Mittal VS, Copley LA. [Team Approach: Pediatric Musculoskeletal Infection](#). *JBJS Rev*. 2020 Mar;8(3):e0121. PMID:32224640

11. **Dhar AV**, Scott S, Anton-Martin P, Tweed J, Morris MA, Modem V, **Raman L**, Golla S. [Neurodevelopmental Outcomes in Extracorporeal Membrane Oxygenation Patients: A Pilot Study](#). *ASAIO J*. 2020 Apr;66(4):447-453. PMID:31335369
12. **Efune PN**, Longanecker JM, Alex G, Saynhalath R, Khan U, Rivera K, Jerome AP, Boone W, Szmuk P. [Use of dexmedetomidine and opioids as the primary anesthetic in infants and young children: A retrospective cohort study](#). *Paediatr Anaesth*. 2020 Sep;30(9):1013-1019. PMID:32510703
13. **Efune PN**, Saynhalath R, Blackwell JM, Steiner JW, Olomu PN, Szmuk P. [The Truview PCD™ video laryngoscope for nasotracheal intubation in pediatric patients: A subset analysis from a prospective randomized controlled trial](#). *Paediatr Anaesth*. 2020 Oct;30(10):1157-1158. PMID:32805748
14. **Efune PN**, Alex G, Journeycake J, Mehta SD. [Thromboelastography-targeted management of severe coagulopathy and off-label use of four-factor prothrombin complex concentrate in an infant with massive bleeding](#). *Blood Coagul Fibrinolysis*. 2020 Mar;31(2):170-173. PMID:31977329
15. **Esangbedo I, Yu P**, Raymond T, Niles DE, Hanna R, Zhang X, Wolfe H, Griffis H, Nadkarni V, Pediatric Resuscitation Quality (pediRES-Q) Collaborative Investigators. [Pediatric in-hospital CPR quality at night and on weekends](#). *Resuscitation*. 2020 Jan 1;146():56-63. PMID:31734222
16. **Esangbedo ID**, Byrnes J, Brandewie K, Ebraheem M, **Yu P**, Zhang S, Raymond T. [Risk Factors for Peri-Intubation Cardiac Arrest in Pediatric Cardiac Intensive Care Patients: A Multicenter Study](#). *Pediatr Crit Care Med*. 2020 Dec;21(12):e1126-e1133. PMID:32740187
17. **Esangbedo ID**, Brunetti MA, Campbell FM, Lasa JJ. [Pediatric Extracorporeal Cardiopulmonary Resuscitation: A Systematic Review](#). *Pediatr Crit Care Med*. 2020 Oct;21(10):e934-e943. PMID:32345933
18. Feldstein LR, Rose EB, Horwitz SM, Collins JP, Newhams MM, Son MBF, Newburger JW, Kleinman LC, Heidemann SM, Martin AA, Singh AR, Li S, Tarquinio KM, Jaggi P, Oster ME, Zackai SP, Gillen J, Ratner AJ, Walsh RF, Fitzgerald JC, Keenaghan MA, Alharash H, Doymaz S, Clouser KN, Giuliano JS Jr, Gupta A, Parker RM, Maddux AB, Havalad V, Ramsingh S, Bukulmez H, Bradford TT, Smith LS, Tenforde MW, Carroll CL, Riggs BJ, Gertz SJ, Daube A, Lansell A, Coronado Munoz A, Hobbs CV, Marohn KL, Halasa NB, Patel MM, Randolph AG, Overcoming COVID-19 Investigators, CDC COVID-19 Response Team. [Multisystem Inflammatory Syndrome in U.S. Children and Adolescents](#). *N Engl J Med*. 2020 Jul 23;383(4):334-346. PMID:32598831
19. Fox J, Jenks CL, Farhat A, Li X, Liu Y, James E, Karasick S, Morriss MC, Sirsi D, **Raman L**. [EEG is A Predictor of Neuroimaging Abnormalities in Pediatric Extracorporeal Membrane Oxygenation](#). *J Clin Med*. 2020 Aug 4;9(8):. PMID:32759731
20. Gordon SE, Heath TS, **McMichael ABV**, Hornik CP, Ozment CP. [Evaluation of Heparin Anti-Factor Xa Levels Following Antithrombin Supplementation in Pediatric Patients Supported With Extracorporeal Membrane Oxygenation](#). *J Pediatr Pharmacol Ther*. 2020;25(8):717-722. PMID:33214783
21. Hook JS, Cao M, Weng K, Kinnare N, **Moreland JG**. [Mycobacterium tuberculosis Lipoarabinomannan Activates Human Neutrophils via a TLR2/1 Mechanism Distinct from Pam3 CSK4](#). *J Immunol*. 2020 Feb 1;204(3):671-681.

PMID:31871022

22. Jones AH, Heneghan JA, Brooks B, **Maamari M**, Ahmad A, October TW, Corriveau C. [A Quality Improvement Project to Improve Documentation and Awareness of Limitations of Life-Sustaining Therapies](#). *Pediatr Qual Saf*. 2020 May-Jun;5(3):e304. PMID:32607460
23. Kudchadkar SR, Nelliott A, Awojoodu R, Vaidya D, Traube C, Walker T, Needham DM, Prevalence of Acute Rehabilitation for Kids in the PICU (PARK-PICU) Investigators and the Pediatric Acute Lung Injury and Sepsis Investigators (PALISI) Network. [Physical Rehabilitation in Critically Ill Children: A Multicenter Point Prevalence Study in the United States](#). *Crit Care Med*. 2020 May;48(5):634-644. PMID:32168030
24. LaRovere KL, Tasker RC, Wainwright M, Reuter-Rice K, Appavu B, **Miles D**, Lidsky K, Vittner P, Gundersen D, O'Brien NF, Pediatric Neurocritical Care Research Group (PNCRG), [Transcranial Doppler Ultrasound During Critical Illness in Children: Survey of Practices in Pediatric Neurocritical Care Centers](#). *Pediatr Crit Care Med*. 2020 Jan;21(1):67-74. PMID:31568242
25. Lee AE, Pandiyan P, Liu MM, Williams MA, Everett AD, Mueller GP, Morriss MC, **Raman L**, Carlson D, Gatson JW. [Tau Is Elevated in Pediatric Patients on Extracorporeal Membrane Oxygenation](#). *ASAIO J*. 2020 Jan;66(1):91-96. PMID:30507848
26. Maratta C, **Potera RM**, van Leeuwen G, Castillo Moya A, **Raman L**, Annich GM. [Extracorporeal Life Support Organization \(ELSO\): 2020 Pediatric Respiratory ELSO Guideline](#). *ASAIO J*. 2020 Sep/Oct;66(9):975-979. PMID:32701626
27. **McMichael ABV**, Hornik CP, Hupp SR, Gordon SE, Ozment CP. [Correlation Among Antifactor Xa, Activated Partial Thromboplastin Time, and Heparin Dose and Association with Pediatric Extracorporeal Membrane Oxygenation Complications](#). *ASAIO J*. 2020 Mar;66(3):307-313. PMID:30883406
28. **Miles DK**, Ponisio MR, Colvin R, Limbrick D, Greenberg JK, Brancato C, Leonard JR, Pineda JA. [Predictors of intracranial hypertension in children undergoing ICP monitoring after severe traumatic brain injury](#). *Childs Nerv Syst*. 2020 Jul;36(7):1453-1460. PMID:31970473
29. Mille FK, Badheka A, **Yu P**, Zhang X, Friedman DF, Kheir J, van den Bosch S, Cabrera AG, Lasa JJ, Katcoff H, Hu P, Borasino S, Hock K, Huskey J, Weller J, Kothari H, Blinder J. [Red Blood Cell Transfusion After Stage I Palliation Is Associated With Worse Clinical Outcomes](#). *J Am Heart Assoc*. 2020 May 18;9(10):e015304. PMID:32390527
30. Moody GB, **Luckett PM**, Shockley CM, Huang R, Ari A. [Clinical Efficacy of Vibrating Mesh and Jet Nebulizers With Different Interfaces in Pediatric Subjects With Asthma](#). *Respir Care*. 2020 Oct;65(10):1451-1463. PMID:32209712
31. Rao DR, Maple KL, Dettori A, Afolabi F, Francis JKR, Artunduaga M, Lieu TJ, Aldy K, Cao DJ, **Hsu S**, Feng SY, Mittal V. [Clinical Features of E-cigarette, or Vaping, Product Use-Associated Lung Injury in Teenagers](#). *Pediatrics*. 2020 Jul;146(1):. PMID:32393606
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