

UT Southwestern
Medical Center
Department of Pediatrics

Pediatric Critical Care

2023 Annual Report

Our mission is to deliver unrivaled critical care in an environment that supports compassionate care through collaboration, innovation, education, and research.

Pediatric Critical Care – 2023 Annual Report

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 utilizing innovative treatments to ensure the patient care provided is of the highest quality.

Under the direction of Cindy Darnell Bowens, M.D., M.S.C.S., Interim Division Chief, the Division provides top-quality patient care with the most advanced medical technologies in the 44-bed pediatric intensive care unit (PICU) at Children’s Medical Center Dallas. With a growing need for critical care in the Metroplex, the Division expanded its services to Children’s Medical Center Plano in 2010. Since doing so, that PICU has rapidly outgrown its 12-bed capacity. A new tower expansion to meet the needs of the growing pediatric population is scheduled to open in December 2024. In addition, the Critical Care faculty, in collaboration with the [Division of Pediatric Cardiology](#) and within [The Heart Center at Children’s Medical Center Dallas](#), 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 Critical Care Division also provides consultation services to critically ill children in the burn unit at Parkland Memorial Hospital. The Critical Care Division also supports one of the highest-volume Extracorporeal Life Support (ECLS) programs in the country, providing pediatric ECLS for a variety of diagnoses. The ECLS program was recognized as a Center of Excellence in 2023.









Cindy Darnell Bowens, M.D., M.S.C.S.
Professor, Interim Division Chief

The Division has a long-standing history of clinical, bench, and translational research with National Institutes of Health (NIH)-funded laboratories and regular participation in multicenter clinical trials to advance the care of critically ill children. Members of the Pediatric Critical Care Division hold lead roles in multiple hospital programs, including the Transport Program, CPR Program, Point of Care Ultrasound (POCUS) Program, and Respiratory Care Program.

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 program currently includes 18 trainees across three years of training. Teaching of fellows, residents, and medical students takes place at the bedside and during lectures and interactive simulation sessions.

In addition, a variety of research training opportunities are available to help fellows learn to ask and answer scientific questions relating to the genetic, molecular, cellular, physiologic, and clinical aspects of pediatric critical care medicine.

Numbers at a Glance

 <p>Faculty: 33 New Faculty: 8 Promotions: 5</p>	 <p>Clinical Fellows: 18 Clinical Sites: 4</p>	 <p>Inpatient Encounters: 16,585* Outpatient Encounters: 100*</p>
 <p>Research Funding Total* Grants: \$2,611,206 Contracts: N/A Total # Proposals Awarded: 2 Public Federal (# K Awards): N/A Public State of Texas: N/A Other: 2 Revenue from Active Clinical Trials as of 12/31/2021: \$424,688</p>	 <p>Active Clinical Trials: 3*</p>	 <p>Conferences/Lectures: 20 Publications: 45* Citations: 2,426* Book Chapters: 4</p>

*Sources: Orbit report of RHI032 Organizational Research Dashboard, UTSW Office of Research and Grants Support, Faculty Affairs, Education Alumni Affairs, Clinical Business Operations- invoice creation period for 2023, CVs

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Honors/Awards

Best Pediatric Specialists, *D Magazine*

- Cindy Darnell Bowens
- Archana Dhar
- Darryl Miles
- Jessica Moreland

Texas Super Doctors, *Texas Monthly*

- Sarah Ginsburg (Rising Star)
- Michael Green (Super Doctor)
- Olivia Hoffman (Rising Star)
- Stephanie Hsu (Rising Star)
- Mia Maamari (Rising Star)
- Alan Poole (Rising Star)
- Erin Tresselt (Rising Star)

Cindy Darnell Bowens

- Promoted to Interim Division Chief

Michael Green

- Promoted to Assistant Dean for Graduate Medical Education and Designated Institutional Official

Mia Maamari

- Charles C. Shepard Science Award in Prevention and Control – Centers for Disease Control and Prevention (2023)

Danna Qunibi

- Featured in article titled “Plano PICU sets ‘best in class’ standard of care for the Erwin family” – Plano Pulse

Top Conference Locations

1. Society of Critical Care Medicine, San Francisco, January 2023
2. Association of Pediatric Program Directors, Atlanta, March 2023
3. PALISI Spring Meeting 2023, Olympic Valley, California, March 2023

Education and Training

The Division of Pediatric Critical Care has built its educational emphasis around the diversity of its trainees – medical students, pediatric residents, and members of the fully accredited [fellowship program](#). While most educational activities focus on physicians in various stages of training, Division faculty work with a variety of health care students, including 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 in the different units and participate as integral members of the multidisciplinary team of advanced practice providers, 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 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 spend four weeks in the PICU during each of their second and third years of residency. This experience exposes the residents to a broad spectrum of critically ill children during two distinct phases in their training. To enhance the educational experience, our faculty and fellows provide formal didactic teaching on pertinent critical care topics to the residents during scheduled lectures three days a week, including two high-fidelity simulation sessions designed to reinforce and develop the management skills necessary to care for the critically ill or decompensating child.

As they progress from caring for critically ill children for the first time as second-year residents to functioning as leaders of the PICU teams as third-year providers, our residents experience an increasing confidence in their ability to recognize and stabilize a critically ill or decompensating child and a profound respect for the speed with which illnesses can progress.

Residents from other specialty training programs also rotate through the PICU at varying stages in their training. These include trainees in Emergency Medicine and Family Medicine, where critical care experience is a valuable adjunct to their education. Their experience is tailored to their educational needs to some degree, and their presence in the PICU 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, 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 recruits annually to maintain a cohort of 13-14 fellows. Our program has a strong clinical emphasis, with rotations primarily in the pediatric and cardiac intensive care units. Additionally, fellows have periods of protected time to carry out an individual scholarly project that they develop with the help of faculty from both the Division of Pediatric Critical Care Medicine and the larger UT Southwestern community. Fellows are encouraged to submit their work and have consistent success presenting at academic society meetings.

The fellowship program supports a robust didactic curriculum designed to provide a foundational knowledge of the pathophysiology of critical illness. Other curricula highlights include a simulation, quality improvement, journal club with an evidence-based medicine focus, and a professional development series. Our fellows have an excellent success rate on the American Board of Pediatric Critical Care sub-board examination.

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, M.D., M.S.C.S.](#), focuses her time on quality initiatives and improving daily care for critically ill children.
- [Matthew Borgman, M.D.](#), has been a prolific researcher in pediatric trauma and resuscitation. He was recently a part of the Pediatric Trauma Hemorrhagic Shock Consensus Conference, which published its guidelines in January 2023. He was also elected to the Scientific Steering Committee for the BloodNet Subgroup for the Pediatric Acute Lung Injury and Sepsis Investigators (PALISI) Network.
- [Archana Dhar, M.D.](#), is the site Principal Investigator for an NIH-funded ASCEND project wherein there is longitudinal observation of children with acute respiratory distress syndrome (ARDS) who undergo extracorporeal membrane oxygenation (ECMO) management.
- [Proshad Efunu, M.D.](#), conducts research focused on prediction of events as well as preventive strategies of respiratory events after adenotonsillectomy in high-risk children.
- [Olivia Hoffman, M.D.](#), focuses her research on quality improvement (QI), implementation science, and medical education. She developed and continues to lead a QI curriculum for the Pediatric Critical Care fellows. She individually mentors fellows through QI-based scholarly projects. Dr. Hoffman also participates in and/or co-leads several single institution and multicenter QI initiatives. She is involved in the UTSW Quality Enhancement Plan's Team FIRST as an instructor and lead. Dr. Hoffman is the site Co-Investigator for the NIH-funded study "Handoffs and Transitions in Critical Care – Understanding Scalability (HATRICC-US)" (clinicaltrials.gov identifier: NCT04571749).
- [Peter Luckett, M.D.](#), has current research interests that include clinical trials in pediatric critical care. In 2002, he was an initial organizing member of the PALISI Network clinical trials group. Recent clinical trials include a longitudinal cohort study of post-intensive care syndrome in pediatrics that has recently been concluded and "PROspect" (PRone and OSCillation PEdiatric Clinical Trial), an ongoing multicenter, international trial investigating ARDS ventilator management. As a member of the PALISI Network POST-PICU Scoping Review Investigators, he has participated in the development of a core outcome measurement set for use in pediatric critical care follow-up.
- [Darryl Miles, M.D.](#), is a member of the Pediatric Neurocritical Care Research Group and works to advance the care of neurocritical illness in children and better understand how the brain responds to injury. He has participated in several large multicenter clinical trials studying hypothermia after traumatic brain injury and cardiac arrest and recently served as the site Principal Investigator for the multicenter trial Approaches and Decisions in Acute Pediatric Traumatic Brain Injury (ADAPT). Dr. Miles is currently leading projects using automated pupillometry and transcranial Doppler technology to noninvasively measure intracranial pathology in brain-injured children.
- [Jessica Moreland, M.D.](#), 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.
- [Alan Poole, M.D.](#), was the site PI for "Antithrombin Activity and Catheter-Associated Thrombosis in Critically Ill Children," a multicenter prospective cohort study of critically ill children at high risk of bleeding with central venous catheters. Findings were recently published in the *Journal of Thrombosis and Haemostasis*.
- [Alan Poole, M.D.](#), and [Paige Volk, M.D.](#), lead a group that includes multiple faculty members in the Divisions of Pediatric Critical Care, Allergy and Immunology, and the Lyda Hill Department of Bioinformatics, studying the determinants of severe pediatric asthma exacerbations using data from Children's Health, UTSW, and the Virtual PICU Systems (nationally aggregated data from over 35 children's hospitals) and made possible by disruptions to usual seasonal patterns of asthma exacerbations caused by the COVID-19 pandemic.
- [Lakshmi Raman, M.D.](#), interest is in brain injury and the care of extracorporeal membrane oxygenation (ECMO) patients. She has concentrated her research on the effect of chronic hypoxia on the brain and has been involved in doing prospective studies in patients on ECMO and a study comparing different concentrations of hypertonic saline in the management of intracranial hypertension in traumatic brain injury.
- [Darryl Miles, M.D.](#), and [Lakshmi Raman, M.D.](#), in collaboration with Ann Stowe, Ph.D., have received a grant from the Texas Institute For Brain Injury and Repair (TIBIR) to study the effects of cerebral perfusion pressure in severe traumatic brain injury on central nervous system inflammation after pediatric traumatic brain injury.

Patient Care

Pediatric Critical Care faculty deliver the highest standard of care for critically ill children. The PICUs at Children's Health are primary referral centers for North Central and Northeast Texas. Patients with special needs are also referred from throughout Texas as well as Oklahoma, Arkansas, Louisiana, Mexico, and Latin America.

Depending on their diagnoses, critically ill children are assigned to one of four [PICUs at Children's](#). Specialized medical teams assume primary responsibility for their care in one of these units:

- General medical-surgical PICU (Children's Medical Center Dallas)
- Pediatric cardiovascular intensive care unit (CVICU) (Children's Medical Center Dallas)
- Pediatric trauma-neurosurgical intensive care unit (PTICU) (Children's Medical Center Dallas)
- Level II PICU (Children's Medical Center Plano)

The Division, in collaboration with the [Division of Pediatric Cardiology](#) and [The Heart Center at Children's Medical Center Dallas](#), 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

	2019	2020	2021	2022	2023
CVICU	9,309	7,507	7,057	8,291	8,795
PICU	8,588	9,380	11,966	13,748	13,812
Plano Campus	2,180	1,223	2,148	2,942	3,038

Top Peer-Reviewed Publications

1. Abid S, Lee M, Rodich B, Hook JS, **Moreland JG**, Towler D, Maalouf NM, Keller A, Ratti G, Jain R. [Evaluation of an association between RANKL and OPG with bone disease in people with cystic fibrosis](#). J Cyst Fibros. 2023 Jan;22(1):140-145. PMID: 36041886.
2. Good RJ, Boyer DL, Bjorklund AR, Corden MH, Harris MI, Tcharmtchi MH, Kink RJ, Koncicki ML, Molas-Torreblanca K, Miquel-Verges F, Mink RB, Rozenfeld RA, Sasser WC, Saunders S, **Silberman AP**, Srinivasan S, Tseng AS, Turner DA, Zurca AD, Czaja AS. [Development of an Approach to Assessing Pediatric Fellows' Transport Medical Control Skills](#). Hosp Pediatr. 2023 Jul 1;13(7):e199-e206. PMID: 37376965.
3. Paquette S, Kilcullen M, **Hoffman O**, Hernandez J, Salas E, Greilich P. [Handoffs and the Challenges to Implementing Teamwork Training in the Perioperative Environment](#). Front Psychol. 2023 Jun 15;14:1187262. PMID: 37397334
4. Sanford EL, **Bhaskar P**, Li X, Thiagarajan R, **Raman L**. [Hypothermia after extracorporeal cardiopulmonary resuscitation not associated with improved neurologic complications or survival in children: An analysis of the ELSO registry](#). Resuscitation. 2023 Jul;188:109852. PMID: 37245646.