

# Center for Cerebrovascular Disorders in Children at Children's Health<sup>SM</sup>



Children's Health<sup>SM</sup> is the home of the Center for Cerebrovascular Disorders in Children, which provides a multidisciplinary approach to children with complex, often life-threatening disorders that impact or cause injury to the blood vessels that supply the brain.

As the only Center of its kind in Texas and one of a handful across the nation, we offer an unmatched level of experience.

Our expert team specializes in neurointerventional radiology, neurosurgery, neurology, neurologic critical care and neuro-anesthesia. From strokes and arteriovenous malformations to vein of Galen malformations, Moyamoya disease and cerebral venous thrombosis, we work one-on-one with patients to assess, evaluate, manage and treat conditions.




## the mission of Children's Health has always been to make life better for children.

Our beginnings in 1913 were humble, but even then, our vision was big. Today, our team takes great pride in being the seventh-largest pediatric health care provider in the country, and the only academically affiliated pediatric hospital in the region.

Throughout our history, whether treating common pediatric conditions or giving lifesaving care, the heart of Children's Health is our people. Our unique skills and experience, combined with the latest techniques and technology, provide the most comprehensive health care available. These attributes help us to achieve our vision to make Children's Health among the very best medical centers in the nation.

Our mission yesterday, today and tomorrow is to make life better for children. We believe there is no better affirmation of our mission than seeing happy, healthy patients leave the hospital.



## The Center for Cerebrovascular Disorders in Children offers:

- Assessment and Evaluation
- State-of-the-Art Technology
- Minimally Invasive Treatment Options
- Long-term Follow-up Care



## meet the team



### Bradley Weprin, M.D.

Dr. Weprin is a Professor in the Division of Pediatric Neurosurgery in the Department of Neurological Surgery at UT Southwestern and serves as Director of Pediatric Neurosurgery and Director of Neuro-oncology at Children's Health. Dr. Weprin is also the only pediatric neurosurgeon in the region trained in stereotactic radiosurgery for the treatment of vascular malformations and brain tumors in children. He is a leader in his field, continually seeking ways to improve patient outcomes, experience and treatment options.



### Dale Swift, M.D.

Dr. Swift is a Professor in the Division of Pediatric Neurosurgery in the Department of Neurological Surgery at UT Southwestern and serves as the Director of the Pediatric Neurosurgery Fellowship Program at Children's Health. Dr. Swift is recognized as a leader the field of neurosurgery for vascular malformations in children. He has extensive experience in surgical resection of malformations and revascularization surgery for patients with rare conditions such as Moyamoya. His extensive experience and expertise has also led to his appointment as director where he also serves on the Surgical Peer Review Committee and the Graduate Education Committee.



### Rafael de Oliveira Sillero, M.D.

Dr. Sillero is an Assistant Professor in the Department of Neurological Surgery at UT Southwestern and a pediatric neurosurgeon at Children's Health. He specializes in treating cerebrovascular diseases, including aneurysms, malformed arteries and stroke, with a particular interest in Moyamoya angiopathy and in treatment using revascularization. With dual expertise in neurosurgery and interventional radiology, he's among a small handful of physicians who have experience applying techniques like endovascular embolization to children.

## program affiliation

### UT Southwestern Affiliation

Since 1961, Children's Medical Center has been the primary pediatric clinical partner for UT Southwestern – one of the leading medical education and biomedical research institutions in the country. In addition to extending our academic mission of teaching the next generation of doctors and advancing patient care through quality and research, this partnership also affords our patients access to world-renowned expertise in every aspect of pediatric cerebrovascular care.

## meet the team



### Michael Dowling, M.D.

Dr. Dowling is the Co-Founder and Director of the Pediatric Stroke Program and Medical Director of the Pediatric Stroke Clinic at Children's Health. As an Associate Professor of Pediatrics and Neurology at UT Southwestern, he is widely recognized as an expert in the field of pediatric stroke and is an active member of the International Pediatric Stroke Study team. He currently serves on multiple editorial boards and is an investigator or co-investigator on many of the recent and ongoing multicenter trials in pediatric stroke. Dr. Dowling is the driving force behind a multidisciplinary approach to pediatric stroke management with the development of a comprehensive stroke clinic.



### Wilmot Bonnet, M.D.

Dr. Bonnet is an Assistant Professor in the Department of Pediatrics and the Department of Neurology at UT Southwestern and a pediatric neurologist at Children's Health. He specializes in pediatric ischemic and hemorrhagic stroke, acquired brain injury and neurologic complications of neurovascular disease, including Sturge-Weber syndrome. Dr. Bonnet was the first trainee to complete the combined adult and pediatric vascular neurology fellowship, which he helped build at UT Southwestern.



### Bruno Braga, M.D.

Dr. Braga is an Associate Professor in the Division of Pediatric Neurosurgery in the Department of Neurological Surgery at UT Southwestern. Although he has specialty training in all areas of pediatric neurosurgery, he has special expertise in decompression and instrumentation of the spine to treat traumatic and congenital diseases, minimally invasive spine surgery, microsurgery for removal of brain tumors, endoscopic surgery and microsurgery for resection of AVM or cavernomas. Dr. Braga's interests include clinical research, as he studies diagnostic tools and treatment outcomes in spinal diseases, brain tumors, and vascular and traumatic diseases.



### Timothy Booth, M.D.

Dr. Booth is a pediatric neuroradiologist with more than 30 years of experience. He is Professor of Neuroradiology at UT Southwestern. He has clinical as well as research interests in all areas of neuroimaging in the pediatric population and has recently completed a single institution evaluation of language dominance using resting state MRI. Additionally, we are using quantitative MRI arterial spin labeling techniques in the evaluation of pediatric vascular diseases. Dr. Booth had worked closely with the Pediatric Neurovascular Team at UT Southwestern to optimize imaging in the patients we care for and improve outcomes. He uses advanced imaging techniques such as Diffusion tensor imaging, MR spectroscopy, and functional BOLD imaging to more completely understand vascular pathology in children and assist in determining treatment options.



### Brett Whittemore, M.D.

Dr. Whittemore is an Assistant Professor in the Division of Pediatric Neurosurgery in the Department of Neurosurgery at UT Southwestern. Though he specializes in endoscopic skull base surgery and surgical treatment of spasticity, he treats brain tumors, hydrocephalus, congenital brain and spine malformations, and cerebral cavernous malformations. His research is focused on the mechanisms of hydrocephalus and treatment of posthemorrhagic hydrocephalus in infants.



### Jesse Vallejo, R.N., B.S.N.

Jesse is the Program Manager for the Center of Cerebrovascular Disorders in Children at Children's Health. He is an experienced Registered Nurse with a career spanning over three decades specializing in critical and emergency care and caring for the neurovascular patient population. He develops processes and protocols and is an excellent resource for patients with strokes, vein of galen malformations, arteriovenous malformations, aneurysms, and moya moyo disease. He assists patients and families with plans of care during and after treatment. He continually evaluates processes and outcomes to optimize neurovascular care.

## meet the team



## specialty services

### Neurosurgery

Children's Medical Center offers round-the-clock coverage by dedicated pediatric neurosurgery providers. The group is inclusive of five neurosurgeons with a dedicated team of advanced practice providers that ensure there is continual in-house coverage for neurosurgery patients. This team offers a unique level of expertise in the treatment and management of cerebrovascular disorders and offers a patient-centered approach to the management of these rare and often life-threatening conditions. Our partnership with the UT Southwestern Department of Neurological Surgery allows our children the opportunity to continue this level of care and expertise in cerebrovascular medicine throughout their lifetime. In addition to the breadth of our neurosurgery team, we also have a dedicated operative team of nurses, scrub technicians and leadership with over 10 years of neurosurgery experience.

### Diagnostic and Interventional Radiology

The department of Radiology at Children's Health provides a full range of radiology services and features the very latest radiology equipment specially designed for children, from newborns to teenagers. Our team of pediatric radiologists have specialized training unequalled in North Texas and surrounding states in diagnosing and treating infants, children, adolescents and teens in a full range of conditions. This level of experience is available 24 hours a day by specialized, dedicated pediatric providers.

Children's Medical Center offers two interventional radiology suites and an exceptional level of expertise in imaging and treatment services for pediatric patients with cerebrovascular disorders. This team has been on the forefront of developing and implementing interventional radiology techniques for children, from newborns to teens.

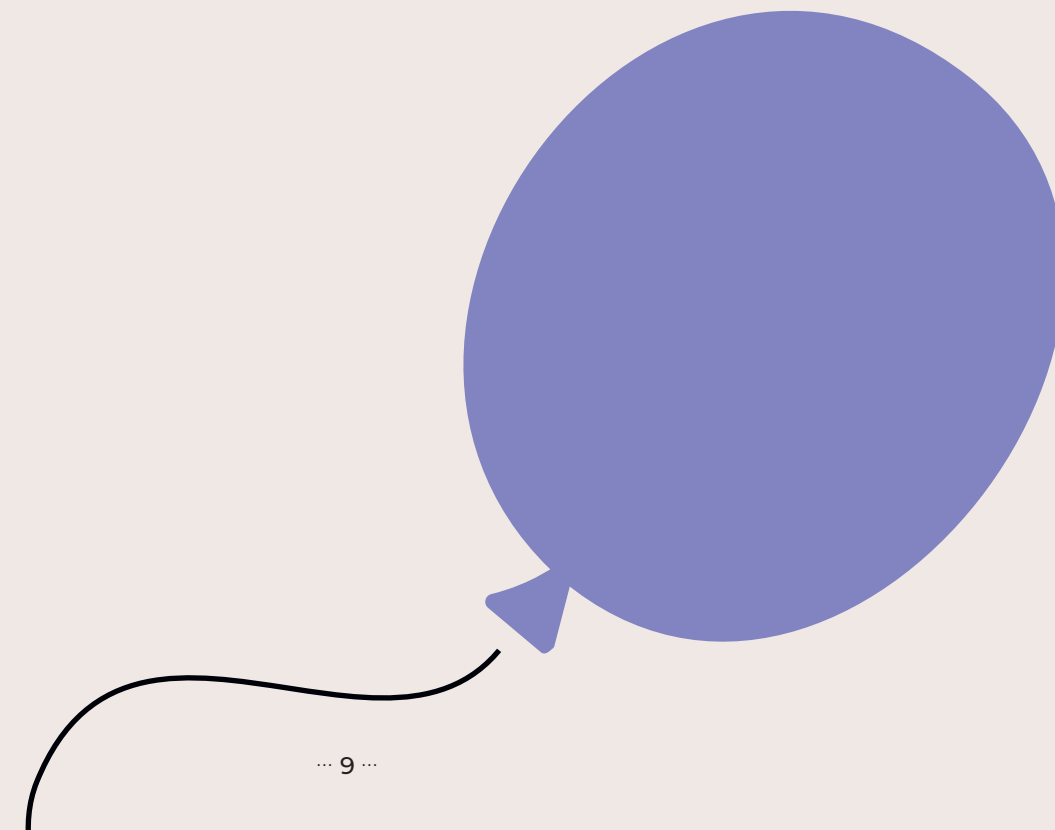
Pediatric patients pose numerous challenges, as they have smaller blood vessels and require considerations of radiation and contrast dosing specific to each patient. This unique approach to patient management and treatment is complemented by the relationship with UT Southwestern neurointerventional radiologists. This relationship allows for an additional layer of expertise in the management of similar disorders in the adult population to allow for collaboration and continual evolution of the field of interventional treatment.

## conditions

- Arteriovenous Malformation
- Arteriovenous Fistula
- Aneurysm
- Arterial Dissection
- Vein of Galen Malformation
- Moyamoya Disease
- Stroke and Cerebrovascular Disease
- Cerebral Sinovenous Thrombosis
- Cavernous Malformation

## procedures

- Cerebral Angiography
- Neurosurgery or Microsurgery
- Radiosurgery
- Thrombolysis
- Angioplasty
- Embolization
- Sclerotherapy
- Revascularization Surgery
- Thrombectomy
- Arterial Chemotherapy



# specialty services

## Stroke Program

Our Comprehensive Stroke Program brings together a multidisciplinary team dedicated to providing timely, personalized care to children suffering from a stroke or other cerebrovascular disorders. We treat and care for children of all ages and see every stage of stroke, from acute care in the Emergency Department through long-term follow-up, rehabilitation and planning for each child's educational needs.

The Stroke team includes experts in pediatric neurology, neurosurgery, neuroradiology, interventional radiology, hematology, neuropsychology, physical and occupational therapy, speech and language therapy, and physical medicine and rehabilitation.

## Hematology

The hematology program at Children's Health is one of the nation's top comprehensive programs for children with blood disorders. This team offers a full array of the latest diagnostic capabilities and therapies available for pediatric hematologic disorders and is a vital part of our cerebrovascular team and our comprehensive stroke program. The specialists in hematology are available 24 hours a day and have dedicated providers for each of the following programs: Bleeding Disorders and Thrombosis, Sickle Cell Disease and General Hematology. We have one of the largest dedicated pediatric hematology medical staffs in the country, and they have been recognized for groundbreaking research and comprehensive care.

## Neuro-Anesthesia

At Children's Health, we have a core team of specialized neuro-anesthesia providers that offer continuous coverage to care for the unique procedural needs of patients with cerebrovascular disorders. No matter the hour, this team provides coverage by working in close conjunction with the radiology, neurosurgery and critical care services to provide a comprehensive and individualized anesthesia treatment plan for our patients.

## Emergency and Critical Care

Children's Medical Center has experts in emergency and critical care medicine to meet the unique needs of children that present with a critical cerebrovascular disorder. We offer a 22-bed neuro/trauma ICU with specialized intensive care providers and nurses that are trained specifically in the management of patients with cerebrovascular disorders. This includes dedicated neurointensivists that are specialized in neurocritical care and partner with both the neurosurgery and critical care teams to provide a higher standard of care for this special patient population.

In addition to our dedicated ICU, we also offer a newly expanded NICU that provides care for the most delicate newborns diagnosed with cerebrovascular anomalies.



# facilities and technology

The facilities and technology offered by Children's Health and UT Southwestern are unparalleled in the region. These services, given the necessity, are available to our patient population in order to meet their unique needs across the spectrum of their care. In partnership with UT Southwestern, our patients have access to the best in the field of radiosurgery and minimally invasive approaches to the treatment of vascular malformations.

- Two dedicated interventional radiology suites with biplane imaging capabilities
- Five imaging centers across the Metroplex with two 3 Tesla MRI suites at the Dallas location
- Two newly renovated dedicated neurosurgery OR suites, among the largest OR suites in the state
- Operating rooms equipped with intra-operative EEG and neurologic navigation capabilities
- Minimally invasive approach to pediatric AVMs with stereotactic radiosurgery – CyberKnife and Gamma Knife
- Near-infrared spectroscopy (NIRS) monitoring for cerebral perfusion
- Transcranial Doppler

The Center for Cerebrovascular Disorders in Children is designed to meet the unique diagnostic and treatment needs of infants, children and teens. We use the most advanced technology and techniques designed especially for pediatric patients in a kid-friendly, nurturing environment.



PATIENT TESTIMONIAL

## Austin Rice

Austin Rice was a typical, active 10-year-old who loved playing baseball. One day at practice, he complained of a severe headache, and within minutes he began sweating profusely with no feeling on his left side. "There was a lot of faith involved that day," said Dawn Rice, Austin's mom. "I knew God was present, because I had this strong feeling I needed to get back over to the baseball field soon after dropping him off."

### Saving Austin's Life

When the paramedics arrived, Austin was in a seizure-like state. The ambulance brought him to Children's Medical Center Plano where doctors in the Emergency Department ordered a CT scan and suspected he had an arteriovenous malformation (AVM), an abnormal tangle of blood vessels that causes multiple irregular connections between the arteries and veins. Once the scan confirmed the diagnosis, Austin was transported to Children's Medical Center Dallas.

A team of specialists were waiting for Austin ready to assess his condition. The decision was made to monitor him overnight. Austin's blood clot was quite large, creating an elevation in the pressure within his head, and his condition became life-threatening when attempts to medically control the pressure began to fail. He was taken to the operating room where neurosurgeon Dr. Bradley Weprin removed the blood clot to decrease intracranial pressure without disturbing the ruptured AVM. "The surgery was a life-saving maneuver," Dr. Weprin says.

Once Austin's brain had recovered enough for another procedure, he returned to the operating room. With the use of image guidance and a new angiogram, the AVM was completely removed. Based on the malformation's location, significant risks were vision loss and motor weakness.

"Dr. Weprin was amazing with keeping us informed," Dawn says. "We moved from California to Dallas six years ago, and we could not be in a better place dealing with a brain issue. Whatever comes up, someone at Children's Health always knows the answer."

### Specialized Care Through a Team Approach

During the additional non-emergent evaluation of Austin's ruptured AVM, it was discovered that he had more AVMs within the brain that had not become symptomatic. He underwent additional testing, and it was determined that Austin has hereditary hemorrhagic telangiectasia (HHT), a genetic blood disorder that causes some blood vessels to not develop properly. Austin came out of the induced coma as soon as the monitors were removed, and his recovery exceeded expectations. He spent three weeks at a rehabilitation facility where a blood clot developed in his leg. Janna Journeycake, M.D., a pediatric thrombosis specialist at Children's Health, implanted a filter to stop the blood clot from traveling to his lungs.



Since his initial management, Austin has undergone two Gamma Knife procedures to remove smaller malformations and continues to be monitored by the team of specialists at Children's Health through the Center for Cerebrovascular Disorders in Children (CCDC).

This Center provides a multidisciplinary approach to patients with complex, often life-threatening disorders that impact or cause injury to the blood vessels supplying the brain. The CCDC is one of only a handful of centers of its kind with nationally recognized pediatric expertise in neurosurgery, neurointerventional radiology and neuro-anesthesia and specializing in arteriovenous malformations, stroke, vein of Galen malformations, Moyamoya and cerebral venous thrombosis.

"Watching the team work together and make decisions, their passion and commitment is evident," Dawn says. "From a mom's perspective, they could not have given my child more attention. So many went above and beyond." Austin undergoes a neuropsychology exam every two years, and once a year, he visits Dr. Michael Dowling, Medical Director of the Pediatric Stroke Clinic at Children's Health, who watches for seizures and other potential issues, as well as Dr. Janna Journeycake, a pediatric hematologist.

### A Thriving Teenager

According to Austin, even in the midst of a scary time for him, the staff made him feel safe. "Dr. Weprin has a brain and skull model and showed me how to build the brain and put it together," Austin says. "Dr. Dowling always makes me laugh with jokes. The therapy dogs came to my room when I went back for the AVM removal. All of this helped me to focus on other things and forget what happened," Austin says.

Austin is back in action and stays busy with school, piano and art lessons, and his Eagle Scout project, which involves painting a mural on a new facility for the homeless. "You would look at him and not realize he went through all he did," Dawn says.





PATIENT TESTIMONIAL

## Jesus Villanueva

Fifteen-year-old Jesus Villanueva recently learned to walk again – a big feat for the all-around sports player whose goal is to be back on the basketball court and football field.

In January 2015, Jesus remembers feeling dizzy while playing basketball at school. He stopped for a water break, and his next memory is paramedics loading him into an ambulance. He had experienced a seizure. “I remember being in lots of pain,” Jesus says.

### Expert Stroke Care

After being checked out at the local hospital in his hometown of Dumas, Texas, an ambulance took him to a hospital in Amarillo. Doctors there quickly realized Jesus had suffered a stroke, causing the blood flow to his brain to be cut off, and he needed a pediatric specialist. The Children’s Health Transport Team picked up Jesus in a jet and flew him to Children’s Medical Center Dallas, the flagship hospital of Children’s Health, where experts in pediatric neurology and neurosurgery were waiting to help him.

A week after he was admitted, his condition worsened. Neurosurgeon Bruno Braga, M.D., removed a piece of his skull to relieve pressure on the brainstem caused by swelling. “Dr. Braga saved my life,” Jesus says. Jesus has continued to be treated as part of the Stroke Program that is aligned with the Center for Cerebrovascular Disorders in Children. As the only program of its kind in Texas, the Center offers the expertise of a collaborative, multidisciplinary team, including pediatric neurosurgeons, neurologists, interventional radiologists and neuro-radiologists.

He suffered a total of three strokes, and his mom, Marisol, is thankful for being at the best place for her son, even if it meant being away from home for more than nine months. “Jesus is doing well because of the care he received at Children’s Health,” Marisol says. Throughout Jesus’ treatment, Dr. Michael Dowling, Director of the Pediatric Stroke Program at Children’s Health, has found ways to brighten his days. “Dr. Dowling is funny,” Jesus says. “He jokes around and makes it easier to deal with.”

### Remarkable Recovery


After significant improvement, Jesus was discharged from the hospital and continues to participate in outpatient therapy. He is very close with his team of physical and occupational therapists, and they all agree that he has worked very hard to achieve the progress that he’s made. Melissa Kauk, a physical therapist who works with him several days a week, says, “Jesus is such a fun patient to work with; he really digs in and is there to participate in every session we have with him. Much of his recovery is due to his attitude and hard work, and it’s inspiring to be a part of.” His favorite activities are working on the elliptical, pedaling on a stationary bike and Wii Boxing.



Jesus is also followed closely by Dr. Janna Journeycake in Hematology and Dr. Didem Inanoglu in Physical Medicine and Rehabilitation. Didem Inanoglu, M.D., credits the collaborative efforts of the entire team and community for helping Jesus on his road to recovery.

“It has been impressive to see how Children’s Health has become a part of his family – they are at Physical and Occupational Therapy multiple days a week and have been staying at the Ronald McDonald House of Dallas since his discharge from the hospital,” Dr. Dowling says. “Because of the collaboration and efforts of a health care system and partnership with the community, Jesus has had the opportunity to make a remarkable recovery.”

Dr. Braga replaced the piece of Jesus’ skull, bringing him one step closer to his goals of being back home and back in the game. Jesus looks forward to being reunited with his two younger siblings at home and getting back to studying his favorite subject – World Geography. When asked what advice he would give to others recovering from strokes, Jesus says to “keep on fighting.”



## Center for Cerebrovascular Disorders in Children

Call **214-456-3442** or visit our website at  
**[childrens.com/ccdc](https://www.childrens.com/ccdc)** to learn more  
about our program or how to refer a patient.

### **Children's Medical Center Dallas**

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