

2014 Research Annual Report

Neurosurgery



Division Summary

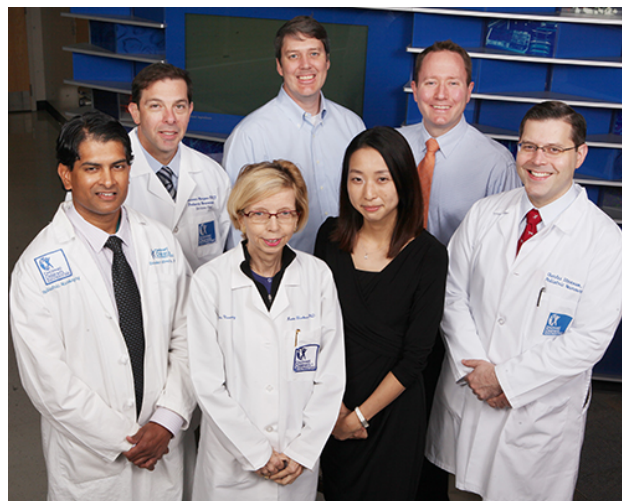
RESEARCH AND TRAINING DETAILS

Number of Faculty	7
Number of Joint Appointment Faculty	4
Number of Research Students	1
Number of Support Personnel	11
Direct Annual Grant Support	\$157,816
Peer Reviewed Publications	25

CLINICAL ACTIVITIES AND TRAINING

Number of Clinical Staff	8
Number of Staff Physicians	7
Number of Clinical Fellows	1
Number of Other Students	1
Inpatient Encounters	479
Outpatient Encounters	3,131

Division Photo



Row 1: S Vadivelu, K Bierbrauer, J Goto, C Stevenson

Row 2: F Mangano, S Crone, T Vogel

Significant Accomplishments

Diverse, Collaborative Clinical and Research Activities

The surgical treatment of intractable epilepsy in children, and finding new ways to improve outcomes, remains our division's primary focus. **Division Chief Francesco Mangano, DO**, is co-principal investigator with **WeiHong Yuan, PhD**, Department of Radiology, on a study of advanced MR imaging techniques in the field of hydrocephalus. Work from this multi-institutional study was published internationally.

Collaborating with physicians in medical neuro-oncology and radiation oncology, **Charles Stevenson, MD**, leads the division's brain tumor program. As a member institution of the Pediatric Brain Tumor Consortium (PBTC), Cincinnati Children's continues to innovate in clinical trials related to brain cancer. In one recent trial sponsored by the National Cancer Institute and PBTC, a special virus designed to kill tumor cells but not affect normal cells was injected into malignant brain tumors that defy chemotherapy and radiation therapy. Cincinnati Children's is the only pediatric hospital in the US approved for this treatment.

Stevenson, with colleagues in Physical Medicine/Rehabilitation and Physical Therapy launched a multi-disciplinary surgical spasticity clinic which focuses on early identification of patients with cerebral palsy and spinal cord injury. As part of the Fetal Care Center, Stevenson continues to perform *in utero* repair of myelomeningocele defects. Surgeons are investigating more minimally invasive procedures for both mother and child.

Karin Bierbrauer, MD, collaborates with other institutions to further our understanding of complex injuries and diseases, and is the site principal investigator for a national registry of children with Chiari I malformations and syringomyelia. She performs clinical research on spina bifida and neurologic conditions detected in utero

and in 2014 co-authored a chapter about monitoring for dorsal rhizotomy and ablative spinal procedures in a textbook on intraoperative monitoring.

Dr. Sudhakar Vadivelu, DO, focuses on the surgical and endovascular treatment of children with vascular disorders of the brain and spine, complex craniocervical anomalies, and neurostimulation for children with movement disorders.

Focus on Hydrocephalus

Timothy Vogel, DO, heads a developmental neuroscience laboratory that studies primary and motile ciliary signaling related to hydrocephalus, a common neurological condition occurring in one in 1,000 children. The lab, along with collaborators **Kenneth Campbell, PhD**, and **Masato Nakafuku, MD, PhD**, is studying signaling pathways related to ciliary signaling.

Instructor **June Goto, PhD**, collaborating in Mangano's lab, facilitates basic and translational research in hydrocephalus, cooperating with Yuan and Campbell they are studying the molecular and cellular basis of hydrocephalus. In the past year, she performed brain surgeries, immunohistochemistry, and CRISPR-mediated gene targeting using rodent models of hydrocephalus.

Studying Neural Circuits

The laboratory of **Steven Crone, PhD**, studies motor circuits in the brainstem and spinal cord and how they are affected by disease or injury. In the past year he has developed several new mouse models in which specific populations of interneurons in the spinal cord are genetically targeted in order to determine their impact on disease. He has expanded his work on locomotor circuits to include therapies to prevent ventilator dependence in patients with neurodegenerative disease or spinal cord injury.

Division Publications

1. Abruzzo TA, Jimenez L, Ostling L, Stevenson C, Shivashankar R, Leach JL, Jones B. **Advances in the diagnosis and management of vein of Galen malformations.** *Journal of Pediatric Neuroradiology*. 2013; 2:237-261.
2. Bierbrauer K, Air E, King C, Stevenson C. **Monitoring for Dorsal Rhizotomy and Ablative Spinal Procedures.** In: CM Loftus, J Biller, EM Baron, eds. *Intraoperative neuromonitoring*. New York: McGraw-Hill; 2013:475-488.
3. Cancelliere A, Mangano FT, Air EL, Jones BV, Altaye M, Rajagopal A, Holland SK, Hertzler DA, 2nd, Yuan W. **DTI values in key white matter tracts from infancy through adolescence.** *AJNR Am J Neuroradiol*. 2013; 34:1443-9.
4. Cohen AR, Vogel TW, Lidov HG. **The lost art of localization: Franc Ingraham's legacy in pediatric neurosurgery.** *J Neurosurg Pediatr*. 2013; 12:642-54.
5. Dorris K, Sobo M, Onar-Thomas A, Panditharatna E, Stevenson CB, Gardner SL, Dewire MD, Pierson CR, Olshefski R, Rempel SA, Goldman S, Miles L, Fouladi M, Drissi R. **Prognostic significance of telomere maintenance mechanisms in pediatric high-grade gliomas.** *J Neurooncol*. 2014; 117:67-76.
6. Greiner HM, Horn PS, Arya R, Holland K, Turner M, Alsaidi MH, Leach JL, Mangano FT. **Acute postoperative seizures and long-term outcome following pediatric epilepsy surgery.** *Seizure*. 2014; 23:483-6.
7. Gressot LV, Vadivelu S, Hwang SW, Fulkerson DH, Luerssen TG, Jea A. **Spondylolysis of C-2 in children 3 years of age or younger: clinical presentation, radiographic findings, management, and outcomes with a minimum 12-month follow-up.** *J Neurosurg Pediatr*. 2014; 13:196-203.
8. Korostenskaja M, Wilson AJ, Rose DF, Brunner P, Schalk G, Leach J, Mangano FT, Fujiwara H, Rozhkov

- L, Harris E, Chen PC, Seo JH, Lee KH. **Real-Time Functional Mapping With Electrocorticography in Pediatric Epilepsy: Comparison With fMRI and ESM Findings.** *Clin EEG Neurosci.* 2013; 45:205-211.
9. Leach JL, Greiner HM, Miles L, Mangano FT. **Imaging spectrum of cortical dysplasia in children.** *Semin Roentgenol.* 2014; 49:99-111.
10. Lee KD, DePowell JJ, Air EL, Dwivedi AK, Kendler A, McPherson CM. **Atypical meningiomas: is postoperative radiotherapy indicated?** *Neurosurg Focus.* 2013; 35:E15.
11. Manjila S, Vogel TW, Chen Y, Rodgers MS, Cohen AR. **Hypothalamic hamartoma simulating a suprasellar arachnoid cyst: resolution of precocious puberty following microsurgical lesion resection.** *J Neurosurg Pediatr.* 2014; :1-7.
12. Nathan ST, Crawford AH, Lykissas MG, Mangano FT. **Severe Thoracic Kyphosis with Neuropathy in a Three-Year-Old ChildA Case Report.** *The Journal of Bone & Joint Surgery Case Connector.* 2013; 3:e77 1-5.
13. Nathan ST, Mangano FT, Crawford AH. **Spondyloptosis of the Cervical Spine in a Patient with Neurofibromatosis Type 1A Case Report and Review of the Literature.** *The Journal of Bone & Joint Surgery Case Connector.* 2013; 3:e5 1-7.
14. Peariso K, Standridge SM, Hallinan BE, Leach JL, Miles L, Mangano FT, Greiner HM. **Presentation, diagnosis and treatment of bilateral Rasmussen's encephalitis in a 12-year-old female.** *Epileptic Disord.* 2013; 15:324-32.
15. Rajagopal A, Shimony JS, McKinstry RC, Altaye M, Maloney T, Mangano FT, Limbrick DD, Holland SK, Jones BV, Simpson S, Mercer D, Yuan W. **White matter microstructural abnormality in children with hydrocephalus detected by probabilistic diffusion tractography.** *AJNR Am J Neuroradiol.* 2013; 34:2379-85.
16. Stevenson C, Crone K. **Head Injury.** In: MM Ziegler, RG Azizkhan, Dv Allmen, TR Weber, eds. *Operative pediatric surgery.* New York: McGraw Hill; 2014:1055-1066.
17. Trout AT, Larson DB, Mangano FT, Gonsalves CH. **Twiddler syndrome with a twist: a cause of vagal nerve stimulator lead fracture.** *Pediatr Radiol.* 2013; 43:1647-51.
18. Vadivelu S, Desai SK, Illner A, Luerssen TG, Jea A. **Infected lumbar dermoid cyst mimicking intramedullary spinal cord tumor: Observations and outcomes.** *J Pediatr Neurosci.* 2014:21-6.
19. Vadivelu S, Effendi S, Starke JR, Luerssen TG, Jea A. **A review of the neurological and neurosurgical implications of tuberculosis in children.** *Clin Pediatr (Phila).* 2013; 52:1135-43.
20. Vadivelu S, Prasad P, Adesina AM, Kim E, Luerssen TG, Jea A. **Giant invasive spinal schwannoma in children: a case report and review of the literature.** *J Med Case Rep.* 2013; 7:289.
21. Vadivelu S, Sivaganesan A, Patel AJ, Agadi S, Schmidt RJ, Mani P, Jea A. **Practice trends in the utilization of intraoperative neurophysiological monitoring in pediatric neurosurgery as a function of complication rate, and patient-, surgeon-, and procedure-related factors.** *World Neurosurg.* 2014; 81:617-23.
22. Vadivelu S, Willsey M, Curry DJ, McDonald JW, 3rd. **Potential role of stem cells for neuropathic pain disorders.** *Neurosurg Focus.* 2013; 35:E11.
23. Vogel TW, Woo AS, Kane AA, Patel KB, Naidoo SD, Smyth MD. **A comparison of costs associated with endoscope-assisted craniectomy versus open cranial vault repair for infants with sagittal synostosis.** *J Neurosurg Pediatr.* 2014; 13:324-31.
24. Williams MT, Braun AA, Amos-Kroohs RM, McAllister JP, 2nd, Lindquist DM, Mangano FT, Vorhees CV, Yuan W. **Kaolin-induced ventriculomegaly at weaning produces long-term learning, memory, and motor deficits in rats.** *Int J Dev Neurosci.* 2014; 35:7-15.
25. Yuan W, McAllister JP, Mangano FT. **Neuroimaging of white matter abnormalities in pediatric**

Faculty, Staff, and Trainees

Faculty Members

Francesco T. Mangano, DO, Associate Professor

Leadership Director Pediatric Neurosurgery

Karin S. Bierbrauer, MD, Associate Professor

Kerry Crone, MD, Professor

Charles Stevenson, MD, Assistant Professor

Sudhakar Vadivelu, DO, Assistant Professor

Timothy Vogel, MD, Assistant Professor

Joint Appointment Faculty Members

Ellen Air, MD, PhD, Assistant Professor (Neurosurgery)

Kennth Campbell, PhD, Professor (Developmental Biology and Neurosurgery)

Steven Crone, PhD, Assistant Professor (Neurosurgery)

June Goto, PhD, Instructor (Neurosurgery)

Clinical Staff Members

- **Brian Crowley, MSN, RN, CFNP**
- **Cristina Carone, PA-C, MSPA**
- **Kelly Clapp, MSN, RN, CPNP**
- **Michelle Haimowitz, MSN, RN, CPNP**
- **Candace Sturm, MSN, RN, CPNP**
- **Mary Miller, MSN, RN, CPN**
- **Rodolfo Canos, MSN, RN, CPN**
- **Rachel Griffiths, MSN, RN, CPN**
- **Allie Mains, MSN, RN, CPN**
- **Vicky Minning, MSN, RN, CPN**

Trainees

- **Kaveh Asadi-Moghaddam, MD, Fellow**, 2012, Ohio State University PGY6
- **Mohan S., MD, Resident**, 2012, Henry Ford Hospital PGY5
- **Paul Mazaris, MD, Resident**, 2012, Henry Ford Hospital PGY5
- **Michael Sawvel, DO Resident**, 2013, West Virginia University PGY4
- **Daniel Harwell, MD, Resident**, 2012, University of Cincinnati PGY3
- **Ryan Tackla, MD, Resident**, 2012, University of Cincinnati PGY3
- **Jennifer Kosty, MD, Resident**, 2013, University of Cincinnati, PGY1
- **Mohammed Alsaïdi, MD, Resident**, 2013, Henry Ford Hospital PGY5
- **Jonathan York, MD Resident**, 2013, University Of Cincinnati PGY3
- **Christopher Carroll, MD Resident**, 2013, University of Cincinnati PGY1
- **Shawn Vuong, MD Resident**, 2013, University of Cincinnati PGY1

- **Lauren Ostling, MD Resident**, 2012, University of Cincinnati PGY4

Grants, Contracts, and Industry Agreements

Grant and Contract Awards		Annual Direct
BIERBRAUER, K		
Park-Reeves Syringomyelia Research Consortium		
Washington University		
	03/22/12-03/21/16	\$24,816
VOGEL, T		
Role of Neural Progenitor Cells in the Development of Neonatal Hydrocephalus		
Hydrocephalus Association		
	09/01/13-08/31/16	\$133,000
Current Year Direct		\$157,816
Total		\$157,816