2017
Pediatric Surgery
Academic Annual Report
Dear Friends and Colleagues,

2017 was another productive year for Children's of Alabama and the Pediatric Surgical Subspecialties. Significant contributions were made both in the realm of basic scientific discoveries as well as participation in clinical studies. We are pleased to provide the details in this report. Our commitment to discovery and innovation will improve the care we provide for the children in Alabama and beyond.

Sincerely,

Mike K. Chen, MD, MBA
Farley Endowed Chair
Professor of Surgery
Surgeon-in-Chief, Children's of Alabama
Director, Division of Pediatric Surgery
Department of Surgery
UAB School of Medicine
The Pediatric Surgical Subspecialties at Children's of Alabama are comprised of 10 subspecialty divisions, each with specific interests and focus on education, research and excellent clinical care. The highlights and accomplishments of each division and its faculty in 2016 will be detailed.

**Pediatric Surgical Subspecialties**

1. Pediatric General Surgery
2. Pediatric Neurosurgery
3. Pediatric Oral/Maxillofacial Surgery
4. Pediatric Orthopedic Surgery
5. Pediatric Plastic Surgery
6. Pediatric Urology
The Division of Pediatric Surgery continues to be productive in a broad range of research--pediatric oncology, necrotizing enterocolitis, pediatric trauma, and clinical outcomes research. This division has garnered over $500,000 in grant funding to support the research mission.

Dr. Elizabeth Beierle continues her research efforts focused on novel treatment strategies for pediatric solid tumors and utilizing patient-derived xenograft models of pediatric solid tumors to study these innovative therapies. She continues to evaluate the utility of a novel rexinoid therapy, 9-cisUAB30, for the treatment of pediatric neuroblastoma and high-risk pediatric medulloblastoma. In addition to her basic science research, Dr. Beierle has been involved in the utilization of the National Cancer Database to evaluate outcomes and disparities in pediatric cancer outcomes. Her published manuscripts have involved evaluation of outcomes in pediatric head and neck melanoma, thyroid cancer, and testicular/ovarian malignancies.

Obesity continues to be a problem among early adolescents within the United States. Dr. Mike Chen continues his leadership as the local PI for the NIH prospective observational study: Teen-Longitudinal Assessment of Bariatric Surgery (Teen-LABS). This project continues to publish important manuscripts on the outcomes of bariatric surgery on teenage patients.

Necrotizing enterocolitis continues to be a significant source of morbidity and mortality in premature infants. Dr. Colin Martin has established a laboratory and clinical effort, as surgical director of the Children's of Alabama/UAB Center for Advanced (CCAIR) Intestinal Rehabilitation, focused on improving outcomes in pediatric patients with necrotizing enterocolitis and short bowel syndrome. With a multidisciplinary effort, CCAIR has 5 active research protocols. His investigational focus continues to define the role of innate immunity in intestinal diseases of prematurity. Specifically, they are interested in how the environment during pregnancy and shortly after birth, shapes developing neonatal immune function. The overall goal is to develop novel vaccine strategies that can protect neonates at risk for intestinal diseases.

Trauma continues to be the most common cause of mortality and morbidity in the children over one year of age. Dr. Rob Russell continues to investigate the pediatric response to trauma in relation to development of coagulopathy following trauma. His current investigations have begun to characterize the very early changes in the endothelial microenvironment following trauma. He has begun to utilize murine models to evaluate potential early therapies to combat this maladaptive response to severe trauma. In addition, he has continued to publish research characterizing important clinical outcomes surrounding pediatric surgical care with the National Surgical Quality Improvement Project-Pediatrics (NSQIP-P) and multi-institutional collaboration.

**Publications**


Dr. Mike Chen was elected to the American Pediatric Surgical Board of Governors as Treasurer.

Dr. Elizabeth Beierle was named the vice chair for faculty development for the Department of Surgery at UAB and was awarded grants from the Kaul Pediatric Research Institute, the Dixon Pediatric Fellowship, the Cannonball Cancer Kids’ Foundation and the Hyundai Hope on Wheels to continue her research in pediatric solid tumors.

Dr. Colin Martin was awarded grants by the American Surgical Association, Kaul Pediatric Research Institute, the UAB Faculty Development Grant, and the Society for Surgery of the Alimentary Tract to pursue his research.

Dr. Rob Russell was awarded the C. James Carrico, MD, Faculty Research Fellowship for the Study of Trauma and Critical Care by the American College of Surgeons to continue research on coagulopathy following pediatric trauma.
The Division of Pediatric Neurosurgery performed a variety of clinical research and has published in a variety of topics resulting in 24 peer-reviewed publications in 2017.

**Publications**


    Network. Shunting outcomes in posthemorrhagic hydrocephalus: results of a Hydrocephalus Clinical Research 

    Kestle JR; for the Hydrocephalus Clinical Research Network. Ventricular catheter entry site and not catheter tip 
    location predicts shunt survival: a secondary analysis of 3 large pediatric hydrocephalus studies. J Neurosurg 

12. Donson AM, Apps J, Griesinger AM, Amani V, Witt DA, Anderson RCE, Niazi TN, Grant G, Souweidane M, 
    **Johnston JM**, Jackson EM, Kleinschmidt-DeMasters BK, Handler MH, Tan AC, Gore L, Virasami A, Gonzalez- 
    Meljem JM, Jacques TS, Martinez-Barbera JP, Foreman NK, Hankinson TC; Advancing Treatment for Pediatric 
    Cerebrospinal Fluid Outflow Obstruction Consortium. Molecular Analyses Reveal Inflammatory Mediators in the 
    Solid Component and Cyst Fluid of Human Adamantinomatous Cerebrospinal Fluid Outflow Obstruction 

    pediatric concussions and return-to-learn (RTL): Implications for RTL policy, research, and practice. Rehabil 

14. Sanders FH, Edwards BA, Fusco M, Oskouian RJ, Tubbs RS, **Johnston JM**. Extremely large sinus pericranii with 
    involvement of the torcular and associated with Crouzon's syndrome. Childs Nerv Syst. 2017 Sep;33(9):1445- 

15. Waters AM, **Johnston JM**, Reddy AT, Fivesh J, Madan-Swain A, Kachurak K, Bag AK, Gillespie GY, Markert JM, 
    Friedman GK. Rationale and Design of a Phase 1 Clinical Trial to Evaluate HSV G207 Alone or with a Single 
    Radiation Dose in Children with Progressive or Recurrent Malignant Supratentorial Brain Tumors. Hum Gene 


    to provide continuous irrigation for neuroendoscopy: technical note. J Neurosurg Pediatr. 2017 Dec 8;1-7. doi: 
    10.3171/2017. [Epub ahead of print]


    surgical site infection following nonshunt pediatric neurosurgery: a review of 9296 procedures from a national 

22. Sherrod BA, **Rocque BG**. Morbidity associated with 30-day surgical site infection following nonshunt pediatric


External Funding

1. Ongoing support from CDC Grant supporting National Spina Bifida Patient Registry (NSBPR). $300,000 over multiple years.

2. Ongoing support from collaborative prospective clinical trials:
   - Hydrocephalus Research Network
   - Park-Reeves Endowment for the Study of Chiari Malformations
   - Shunt Site Entry Trial (RCT)
   - Chiari Bone Only Decompression Trial (RCT)

Pediatric Neurosurgery Research/Awards/Recognition/Leadership

Dr. Jeffrey Blount was the visiting Professor and Inaugural Keynote Speaker at Surgery Research Day at Riley Children's Hospital in Indianapolis in May 2017. He was also an invited speaker to the 10th International Conference on Mechanisms of Neural Tube Defects in Austin in September 2017. Finally, he is on the Editorial Board of Journal of Neurosurgery-Pediatrics and Neurosurgery.

Dr. Curtis Rozzelle is the Site PI for the Hydrocephalus Research Network and the Site PI for the Shunt Insertion Trial

Dr. James Johnston was appointed as the Surgical Site PI for the phase I trial of oncolytic herpes virus in pediatric brain tumors and the Site PI for Bone Only Randomized Trial. He is currently the Medical Director for the UAB Concussion Research Program and co-founded the complement fixation research program/corporation at UAB.

Dr. Brandon Roque was appointed to the Scientific Education and Advisory Board of the Chiari/Syringomelia Foundation and the CURE Hydrocephalus International Advisory Board. He has recently submitted applications for NIH R21 and DOD grants.

Dr. Jerry Oakes received the Frank Ingraham Award in Pediatric Neurosurgery at the Pediatric Section Meeting in Houston, TX in December 2017. This is the highest award offered for academic, career long excellence in Pediatric Neurosurgery. It is not awarded every year but only for those candidates in the opinion of the Executive Committee of the Section exhibit exemplary academic accomplishment, technical excellence, and character.
Pediatric Oral/Maxillofacial Surgery

The Department of Oral and Maxillofacial Surgery has $1.3M in direct grant funding and $373K in Indirect funding for a combined total of $1.7M. The majority of this funding is attributable to support from NIH. Number of investigators within the division have interest in temporomandibular joint disease (TMJ) and are studying different elements of the disease process. Dr. Mohammad Hassan is studying biomarkers to improve early detection by isolating RNA from TMJ fluid. Dr. Patrick Louis is evaluating treatments for TMJ dysfunction in several clinical projects: A comparison of arthroscopy versus modified condylotomy, an evaluation of the Biomet TMJ Replacement System and outcomes of TMJ arthroplasty using prosthetic devices.

Dr. Amjad Javed is interested in the Runx2 gene and its effects over the molecular regulation/synthesis and degeneration of TMJ and growth plate cartilage. This is being studied with inducible tissue-specific models to delete Runx2 gene in proliferative and differentiated chondrocytes. In addition, he is evaluating the osteoblast role in homing and progression of cancer metastasis to bone. They are testing if suppression of Runx2 in osteoblasts alters the bone microenvironment to actively promote and support tumor cell homing, survival and growth at new bone sites. Finally, he is studying the role of Runx2 controlled osteoblast signals in regulating marrow adipogenesis and energy homeostasis.

Dr. Anthony Morlandt is evaluating aggressive odontogenic tumors with optical imaging. He plans to eventually develop a mouse model of odontogenic tumors for further study. In addition, he is evaluating the role of increased expression of certain matrix metalloproteinases (MMPs) in these gingival squamous cell cancers. By measuring these, he hopes to create a risk model to guide surgical decision-making for patients with this disease.

Dr. Dobrawa Napierala is evaluating animal models of genetic disorders affecting craniofacial development. Specifically, the results of this study will provide greater understanding of molecular pathology underlying syndromes associated with palatal clefting and lay the foundation for development of molecular therapeutic approaches. Also, Dr. Napierala is interested in the mechanisms of bone-regeneration failure in periodontal disease. This project intends to address the molecular mechanisms underlying the loss of bone regenerative potential of mesenchymal stem cells exposed to periodontal disease.

Dr. Peter Waite has a particular interest in TMJ arthritis in juvenile rheumatoid arthritis (JRA). He is currently studying the incidence of this disease and performing microassay analysis of TMJ fluid in patients with JRA. He hopes to improve the understanding of this disease in a specific group of patients and improve their outcomes. In addition, he is evaluating the epidemiology of orthognathic surgery by comparing private and academic oral/maxillofacial surgeons.

Finally, Dr. Somak Sittitavornwong is performing clinical studies evaluating outcomes of facial trauma, specifically mid-facial trauma, at UAB. He is also studying specific anatomical facial landmarks and specific operative approaches for oral/maxillofacial surgery.
Pediatric Orthopedic Surgery

Faculty in Pediatric Orthopaedic surgery are involved in a wide range of research activities from basic science of fracture healing and growth plate development to clinical studies that include retrospective studies, clinical trials, including multicenter trials, and studies utilizing large national databanks. Broad areas of research interest include education, orthopaedic trauma, sports medicine and myelodysplasia.

Publications


Pediatric Orthopaedic Surgery Grant/Awards/Recognition/Leadership

Dr. Michael Conklin has been selected to serve on a CDC advisory board regarding determining best practices for care of Myelodysplasia.

Dr. Shawn Gilbert serves on the leadership committee for the International Perthes Study Group. He has chaired the American Academy of Orthopaedic Surgery Basic Science Evaluation committee for the past three years. He was asked to serve on a committee to develop a sub-specialty specific recertification exam by the American Board of Orthopaedic Surgery.
The division of pediatric plastic surgery has a wide breadth of focus on specific clinical problems, global education, and research involving wound healing. Dr. John Grant continues to host, mentor, and educate international fellows at Children’s of Alabama. Dr. Grant has participated in several international workshops in Egypt and India by giving lectures and performing live surgery to educate on topics including cleft lip/palate and craniofacial surgery. He continues to cultivate relationships with local surgeons in Kumasi, Ghana, Egypt, and Vietnam—this is a commitment to teaching local surgeons better surgical techniques and developing international clinical research initiatives.

Dr. Tim King continues research including cutaneous wound healing, regenerative therapies, tissue engineering, and 3-D printing. His NIH K08 grant focuses on the role of Notch2 and Notch3 in cutaneous wound healing.

**Publications**


**Pediatric Plastic Surgery Awards/Recognition/Leadership**

Dr. Tim King was elected to the UAB School of Medicine Faculty Council Committee.

Dr. John Grant was invited faculty at a live surgical workshop in both Egypt and India where he taught cleft and complex craniofacial surgical procedures and gave educational lectures.
Pediatric Urology

The Section of Pediatric Urology has a wide variety of research interests ranging from spina bifida outcomes, renal stone disease in pediatric patients, and advances and application of robotic surgery. Dr. David Joseph has more than $500,000 in grant funding to specifically study improving care and outcomes in the spina bifida population, and to evaluate the efficacy of BOTOX® in urinary incontinence and neurogenic detrusor overactivity.

Dr. David Joseph is exploring outcomes in surgical management of hypospadias and open extravesical approaches in the treatment of vesicoureteral reflux. He is also exploring innovative interactive computer assisted learning for the enhancement of resident education.

Dr. Pankaj Dangle, is directing the cooperative Urologic Robotic program of UAB and COA.

Publications


Pediatric Urology Awards/Recognition/Leadership

Dr. David Joseph received the inaugural Bruskewitz Distinguished Alumni Award from the University of Wisconsin Department of Urology. He is currently the Chair of the Section on Urology of the American Academy of Pediatrics. He is a trustee and Secretary-Treasurer of the American Board of Urology. He is a member of the ACGME Urology RRC.