Division Data Summary

Research and Training Details

<table>
<thead>
<tr>
<th>Details</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Faculty</td>
<td>51</td>
</tr>
<tr>
<td>Number of Joint Appointment Faculty</td>
<td>2</td>
</tr>
<tr>
<td>Number of Research Fellows</td>
<td>1</td>
</tr>
<tr>
<td>Number of Research Students</td>
<td>7</td>
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<tr>
<td>Number of Support Personnel</td>
<td>232</td>
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<tr>
<td>Direct Annual Grant Support</td>
<td>$2,922,071</td>
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<tr>
<td>Direct Annual Industry Support</td>
<td>$458</td>
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<tr>
<td>Peer Reviewed Publications</td>
<td>103</td>
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Clinical Activities and Training

<table>
<thead>
<tr>
<th>Details</th>
<th>Quantity</th>
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</thead>
<tbody>
<tr>
<td>Number of Clinical Staff</td>
<td>37</td>
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<tr>
<td>Number of Clinical Fellows</td>
<td>9</td>
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<tr>
<td>Number of Other Students</td>
<td>83</td>
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<tr>
<td>Inpatient Encounters</td>
<td>51,725</td>
</tr>
<tr>
<td>Outpatient Encounters</td>
<td>156,567</td>
</tr>
</tbody>
</table>

Significant Publications

Division Highlights

Grant Funding

Primary investigators in imaging received $11.0 million in new direct and indirect grant funding this year, adding to the $17.9 million in imaging grants and $3.9 million in imaging support of other research projects. These funds support diverse research efforts including developing novel non-invasive tumor therapies, neuroimaging of behavioral disorders, and the imaging of familial cardiac disease. Additionally, we have been notified of $5.3 million in grant funding likely to be awarded in the coming fiscal year, indicating our expected growth and continued recognition of the value of our research activities to pediatric health. Our faculty authored or co-authored 102 peer reviewed publications this year, the most productive year ever and a 10% increase over last year.

Pediatric Functional Imaging Research Network

Funded by a $6.5 million contract from NIH to CCHMC Radiology, Neurology, and Bioinformatics, the Pediatric Functional Neuroimaging Research Network has been formed as a nationwide resource for pediatric neuroimagers and researchers. With the collaboration of five other institutions, novel functional imaging techniques, analysis tools, and quality control methods have been developed that will be available to researchers free online. These tools will facilitate the gathering of neuroimaging and behavioral data of at
Interventional Radiology Animal Research Lab

In May of 2011 we opened a new state-of-the-art Interventional Radiology (IR) animal research lab, broadening the imaging capabilities of the Imaging Research Center (IRC). The Philips FD20 Allura angiointerventional system mirrors our clinical equipment we currently use in IR in the PeriOp area on A3, and will provide a facility to conduct translational research which can carry over to the clinical care of our patients. 3-D angiography, c-arm cone beam CT, and integrated real-time 3-D needle guidance are just a few of the cutting edge technologies available in the animal lab. It is the first IR animal research facility of its kind in the world in a pediatric institution. IR has already started collaborative research projects with other CCHMC departments. While the lab will be used primarily by Interventional Radiology, the facility is intended to be an institution wide, multi-disciplinary resource to develop and improve image guided treatment options for a broad variety of pediatric diseases.

Honors and Awards

Caffey Award for Best Basic Science Paper:
An MR System for Imaging Neonates in the NICU, Jean Tkach, Randy Giaquinto, Wolfgang Loew, Ronald Pratt, Barret Daniels, Blaise Jones, Lane Donnelly, Charles Dumoulin

Caffey Award for Best Case Report Exhibit:
MR Imaging Features of Fetal Mediastinal and Intrapерicardial Teratomas, Eva Rubio, Beth Kline-Fath, Maria Calvo-Garcia, Carolina Guimares.

John Kirkpatrick Young Investigator Award:
Incidence and Etiology of New Liver Lesions in Pediatric Patients Previously Treated for Malignancy, Ethan Smith, Sheila Salisbury, Rose Martin, Alexander Towbin

In addition, the radiology IT group received the Roger A Bauman Award at the Society for Imaging Informatics in Medicine (SIIM) meeting for their paper: Standardized Reporting in Radiology: A Prospective Analysis of Error Rate and Turnaround Time. Matt Hawkins, Seth Hall, Judy Hardin, Shelia Salisbury, Alex Towbin. The award is given to the best student paper at the meeting. It is the only award for papers. Matt Hawkins also won one of the 4 New Investigator travel awards for this work.

Division Collaboration

Radiology; Neurology; » T. Abruzzo, MD; H. Greiner, MD; M. Kabbouche, MD; J. Leach, MD; M. Zuccarello
Rotational vertebral artery occlusion in a child with multiple strokes

Radiology; Oncology; » T. Abruzzo, MD; J. Leach, MD; R. Jackson; J. Keller; D. Adams, MD
Is the PHACE phenotype associated with a developmental lesion of trigeminal innervation?

Radiology; Nephrology » T. Abruzzo, MD; J. Leach, MD; B. Jones, MD; K. O'Brien; J. Bissler, MD
Calcifications associated with pediatric intracranial aneurysms: incidence and correlation with pathogenic subtypes

Radiology; Oncology; Speech Pathology; Ophthalmology; Neurology; Biostatistics and Epidemiology; Pharmacy » T. Abruzzo, MD; J. Geller, MD; J. Augsburger, MD; J. Leach, MD; B. Jones, MD; J. Perentesis, MD; R. Nagarajan, MD; L. Wagner, MD; D. Adams, MD; T. Cripe, MD; M. Absalon, MD; K. Burns, MD; B. Weiss, MD; M. Fouladi, MD; T. Hummell, MD; M. O'Brien, MD; C. Phillips, MD; C. Stewart, MD; C. West, MD; D. Rose, MD; Z
A pilot study of intra-ophthalmic artery topotecan infusion for patients with retinoblastoma for which ocular enucleation remains the only standard treatment option

Radiology; Emergency Medicine; Critical Care; Neurology » T. Abruzzo, MD; Thrombolysis in pediatric stroke study

Radiology; Hematology/Oncology; Ophthalmology; Pharmacy; Neurology; Pathology » T. Abruzzo, MD; Intra-arterial topotecan for advanced retinoblastoma

Radiology; Pulmonary; Pathology » A. Brody, MD; L. Young, MD; T. Boyd, MD; Childhood Interstitial Lung Disease

Radiology; Nephrology and Hypertension » A. Brody, MD; J. Bissler, MD; Renal Angiomyolipomas

Radiology; Otolaryngology » A. Brody, MD; B. Hopkins, MD; B. Koch, MD; Diagnostic capability of airway in croup and bacterial tracheitis

Radiology; Pulmonary » A. Brody, MD; L. Young, MD; M. Rattan, MD; TSC-LAM Study

Radiology; Behavioral Medicine and Clinical Psychology » A. Brody, MD; S. Powers, MD; HRCT & Growth in preschoolers receiving behavioral and nutrition treatment

Radiology; Gastroenterology » A. Brody, MD; J. Franciosi, MD; A phase 2, open-label, multicenter study to assess the safety and efficacy of certolizumab pegol in children and adolescents with active Crohn's disease

Radiology; Developmental Disabilities » M. Care, MD; L. Kaun; Impact of congenital hearing loss on cerebellar white matter to gray matter volume ratios

Radiology; Mayerson Center » M. Care, MD; M. Greiner, MD; Child Abuse - Presence of subdural collections in patients with macrocrania and enlarged subarachnoid spaces

Radiology Imaging Research; General and Community Based Pediatrics » K. Cecil, PhD; K. Yolton, PhD; Environmental Toxicants & Imaging in a Birth Cohort

Radiology Imaging Research; Neurology » K. Cecil, PhD; D. Gilbert, MD; Anomalous Motor Physiology in ADHD

Radiology Imaging Research; Human Genetics » K. Cecil, PhD; G. Grabowski, MD, PhD; C. Prada, MD, PhD; Imaging Markers of Treatment Response and Progression in Mucopolysaccharidoses

Radiology Imaging Research; Radiology; Neurosurgery » K. Cecil, PhD; J. Leach, MD; T. Maugans, MD; Pediatric Cerebral Concussion: a MRI Analysis

Radiology Imaging Research; Radiology; Neurology » K. Cecil, PhD; M. Care, MD; D. Franz, MD; Everolimus Therapy of Giant Cell Astrocytomas in Patients with Tuberous Sclerosis Complex

Radiology Imaging Research; Radiology; Nephrology and Hypertension » K. Cecil, PhD; M. Care, MD; J. Bissler, MD, PhD; Therapy of Angiomyolipomas in Patients with Tuberous Sclerosis Complex (TSC) and Sporadic Lymphangioleiomyomatosis (LAM)

Radiology Imaging Research; Radiology; Hematology and Cancer » K. Cecil, PhD; K. Kukreja, MD; A. Towbin, MD; N. Johnson, MD; J. Racadio, MD; T. Cripe, MD, PhD
A Phase I Dose Escalation Study of Intra-tumoral Herpes Simplex Virus-1 Mutant HSV1716 in Patients with Refractory Non-Central Nervous System (non-CNS) Solid Tumors

**Radiology Imaging Research; Radiology; Hematology and Cancer** » K. Cecil, PhD; A. Towbin, MD; M. Fouladi, MD, PhD

Establishment of an International Diffuse Intrinsic Pontine Glioma (DIPG) Registry

**Radiology Imaging Research; Behavioral Medicine and Clinical Psychology** » K. Cecil, PhD; D. Beebe, PhD

Neurobehavioral Late-Effects in Pediatric Brain Tumors

**Radiology Imaging Research; Radiology; Gastroenterology and Hepatology and Nutrition** » K. Cecil, PhD; W.S. Ball, Jr., MD; J. Heubi, MD

Rare Disease Clinical Research Network: Smith-Lemli-Opitz Syndrome: A Longitudinal Study of Patients Receiving Cholesterol Supplementation: Sterol and Isoprenoid Research Consortium

**Radiology Imaging Research; Radiology; Gastroenterology and Hepatology and Nutrition** » K. Cecil, PhD; A. Towbin, MD; S. Xanthakos, MD

Development of MR-based biomarker panels for NAFLD - a NASH CRN Ancillary Study

**Radiology Imaging Research; Neurology** » K. Cecil, PhD; D. Lindquist, PhD; J. Clark, PhD; T. DeGrauw, MD

Treatment of Creatine Transporter Deficiency

**Radiology Imaging Research; Behavioral Medicine and Clinical Psychology** » M. Difrancesco, PhD; D. Beebe, MD

fMRI study of sleep deprivation in teens

**Radiology Imaging Research; Rheumatology** » M. Difrancesco, PhD; H. Brunner, MD

fMRI/DTI study of neuropsychiatric lupus

**Radiology Imaging Research; Child Psychiatry** » M. Difrancesco, PhD; E. Harris, MD

fMRI/TMS study of OCD

**Radiology Imaging Research; Pulmonary Medicine** » M. Difrancesco, PhD; R. Amin, MD

fMRI/DTI study of the baroreflex and blood pressure control

**Radiology Imaging Research; Anesthesia** » M. Difrancesco, PhD; M. Konig, MD; J. Leach, MD

Study of anesthesia impact on BOLD effect

**Radiology Imaging Research Center; Heart Institute** » C. Dumoulin, PhD; R. Giaquinto; M. Taylor, PhD, MD

Constructing new pediatric cardiac MR imaging coils

**Radiology Imaging Research Center; Heart Institute** » C. Dumoulin, PhD; T. Knilans, MD; J. Towbin, MD

Developing MR guided electrophysiology

**Radiology Imaging Research Center; Perinatal Institute** » C. Dumoulin, PhD; J. Tkach, PhD; J. Whitsett, MD; J. Greenberg, MD; N. Hillman; M. Ikegami; A. Jobe; S. Kallapur; S. Merher

Delivery of the first ONI MR scanner and animal study under a developmental biology protocol for neonatal sheep (N-12)

**Radiology Imaging Research Center; Perinatal Institute** » C. Dumoulin, PhD; J. Tkach, PhD; B. Haberman, MD; W. Brady; S. Merhar, MD

Installation of MRI scanner inside the NICU

**Radiology Imaging Research Center; Pulmonary Medicine** » C. Dumoulin, PhD; R. Amin, MD

Awarded an R01 Grant

**Radiology Imaging Research Center; Pulmonary Medicine** » C. Dumoulin, PhD; R. Amin, MD
Recruitment of senior imaging faculty member to focus on pulmonary imaging. Expansion of business plan to include commitments from Radiology, Pediatrics, and Perinatal Institute

**Radiology Imaging Research Center; Oncology** » C. Dumoulin, PhD; J. Perentesis, MD

Created business plan to bring clinical HIFU equipment and new faculty to the institution

**Radiology Imaging Research Center; Oncology** » C. Dumoulin, PhD; M. DiFrancesco, PhD; J. Perentesis, MD

Proton therapy task force for CCHMC for providing recommendations regarding technical aspects of this new therapy

**Radiology Imaging Research Center; Nephrology** » C. Dumoulin, PhD; Y. Li, PhD; J. Wanaspura, PhD; J. Bissler, MD

Novel uses of high intensity focused ultrasound in the treatment of preclinical models of angiomyolipomas associated with tuberous sclerosis complex

**Radiology; Cardiology** » R. Fleck, MD; J. Wansapura, PhD; M. Taylor, MD; K. Hor, MD; D. Benson, MD; L. Cripe, MD

Cardiac MRI research

**Radiology; Pulmonary Medicine** » R. Fleck, MD; J. Wansapura, PhD; S. Serai, PhD; R. Amin, MD; Dr. McPhall

MR imaging research in cystic fibrosis and congenital muscular dystrophy

**Radiology; Anesthesia; Pulmonary Medicine; Otolaryngology** » R. Fleck, MD; L. Donnelly, MD; M. Mahmoud, MD; R. Amin, MD; S. Shott, MD

MR imaging research: Dynamic modeling of obstructive sleep apnea

**Radiology; Endocrinology** » R. Fleck, MD; I. Little-Gutmark, MD

MR Imaging and modeling of the airway in Turner's Syndrome

**Radiology; Cardiology** » R. Fleck, MD; J. Wansapura, PhD; M. Taylor, MD; K. Hor, MD; D. Benson, MD; L. Cripe, MD

Cardiac MRI research

**Radiology; Anesthesia; Pulmonary Medicine; Otolaryngology** » R. Fleck, MD; L. Donnelly, MD; M. Mahmoud, MD; R. Amin, MD; S. Shott, MD

MRI imaging research: dynamic modeling of obstructive sleep apnea

**Radiology; Endocrinology** » R. Fleck, MD; I. Little-Gutmark, MD

MR imaging and modeling of the airway in Turner’s Syndrome

**Radiology; Pulmonary Medicine** » R. Fleck, MD; J. Wansapura, PhD; S. Serai, PhD; R. Amin, MD; Dr. McPhall

MR imaging research in cystic fibrosis and congenital muscular dystrophy

**Radiology; Neurology** » M. Gelfand, MD; K. Holland, MD; K. Lee, MD; D. Rose, MD

Evaluation and improvement of localization of epileptogenic foci in patients with intractable seizures

**Radiology; Hematology-Oncology** » M. Gelfand, MD; J. Palumbo, MD

PET with non-imaging CT in Langerhans cell histiocytosis (and additional localization CT as needed) to substantially reduce effective dose

**Radiology; Hematology-Oncology** » M. Gelfand, MD; R. Dasgupta, MD; L. Wagner, MD

Lymphoscintigraphy with SPECT for sentinel node localization in soft tissue sarcomas

**Radiology; UC Radiation Safety; UC Radiation Physics** » M. Gelfand, MD; V. Morris, MS; L. Lemen, PhD

Reduction of personnel dose in administration of I-13-MIBG by measurement of dose from each step of the radiopharmaceutical administration
Radiology; Hematology-Oncology » M. Gelfand, MD; B. Weiss, MD; S. Sharp, MD
   I-131-MIBG therapy in neuroblastoma

Radiology; Hematology-Oncology » M. Gelfand, MD; T. Cripe, MD
   PET/CT imaging in bone sarcomas after limb salvage surgery

Radiology; Orthopedics » M. Gelfand, MD; C. Mehlman, MD
   SPECT in patients with back pain

Radiology; Hematology-Oncology » M. Gelfand, MD; M. O’Brien, MD
   Retrospective study of children with primary bone lymphomas

Radiology; Medical Affairs/Pediatrics » M. Goske, MD; K. Mandel, MD
   ACR Quality Improvement Registry in CT scans in children, part of the national Dose Index Registry

Radiology; Hematology » K. Kukreja, MD; R. Gruppo, MD
   Develop guidelines for local tPA therapy for the hospital. Part of multidisciplinary thrombosis group

Radiology; Hematology/Oncology » B. Jones, MD; J. Geller, MD
   A pilot study of intra-ophthalmic artery topotecan infusion for patients with retinoblastoma for which ocular enucleation remains the only standard treatment option

Radiology; Hematology/Oncology » B. Jones, MD; M. Fouladi, MD
   A pilot study of bevacizumab-based therapy in patients with newly diagnosed high grade gliomas and diffuse intrinsic pontine gliomas

Radiology; Hematology/Oncology » B. Jones, MD; T. Hummell, MD
   A study of the incidence of dural venous anomalies in children diagnosed with intracranial neoplasms

Radiology; Hematology/Oncology » B. Jones, MD; M. Fadell, MD; D. Adams, MD
   Prenatal diagnosis and postnatal follow-up of rapidly involuting congenital hemangioma

Radiology; Hematology/Oncology » B. Jones, MD; C. Phillips, MD; L. Miles, MD; M. Sutton, MD; K. Crone, MD; M. Fouladi, MD
   Medulloblastoma with melanotic differentiation

Radiology; Hematology/Oncology » B. Jones, MD; T. Hummel, MD; F. Mangano, MD; J. Geller, MD
   The clinical heterogeneity of desmoplastic infantile ganglioglioma

Radiology; Emergency Medicine » B. Jones, MD; L. Babcock-Cimpello, MD
   Axonal injury in mild traumatic brain injury: KL2 mentored career development program in clinical and translational research

Radiology; Neonatology; Neurology; Radiology Imaging Research Center; » B. Jones, MD; T. Tkach, PhD; R. Giaquinto; W. Loew, PhD; R. Pratt, PhD; B. Daniels; L. Donnelly, MD; C. Dumoulin, PhD
   An MRI imaging system for imaging neonates in the NICU

Radiology; Psychology » B. Jones, MD; K. Dietrich, PhD; K. Cecil, PhD
   Early lead exposure, ADHD, and persistent criminality: Role of Genese and environment

Radiology; Neurology; Psychiatry » B. Jones, MD; E. Harris, MD; D. Gilbert, MD; J. Xiang, PhD
   MEG patterns of brain electrical activity associated with tics in Tourette Syndrome

Radiology; Neurosurgery » B. Jones, MD; T. Abruzzo, MD; L. Serrano, MD; H. Kocaeli, MD; N. Zumberge, MD; F. Mangano, MD; M. Zuccarello, MD; K. Crone, MD
   Neurovascular phenotypes among children with ruptured idiopathic intracranial arterial aneurysms and comparison with the adult phenotype
Radiology; Neurosurgery » B. Jones, MD; R. Buckley, MD; F. Mangano, MD; WH, Yuan, PhD
  Longitudinal comparison of diffusion tensor imaging parameters and neuropsychological measures following endoscopic third ventriculostomy for hydrocephalus

Radiology; Oncology » K. Kukreja, MD; J. Geller, MD
  Develop multi-disciplinary program for treatment of HCC

Radiology; Rheumatology » T. Loar, MD; HK. Kim, MD; T. Graham, MD; D. Kim, MD; C. Anton, MD; S. Salisbury, MD; J. Racadio; B. Dardzinski, PhD
  T2 relaxation time changes in distal femoral articular cartilage in children with juvenile idiopathic arthritis

Radiology; Epidemiology » T. Loar, MD; H. Kalkwarf, MD; J. Bean, MD
  Fracture risk in children with a forearm injury is associated with bone density and bone geometry measured with peripheral QCT and DXA

Radiology; Orthopedics » T. Loar, MD; R. Desai, MD; S. Parikh, MD
  Intra-articular entrapment of medial collateral ligament

Radiology; Hematology/Oncology » T. Loar, MD; L. Wagner, MD; M. Gelfand, MD; F. Ryckman, MD; H. Al-Ghawi, MD; K. Bove, MD
  Nodular fascitis presenting as soft tissue sarcoma

Radiology; Orthopedics » T. Loar, MD; K. Shea, MD; N. Grimm, MD; E. Wall, MD
  Bone bruises and meniscal tears on MRI in skeletally immature children with tibial eminence fractures

Radiology; Rehabilitation » T. Loar, MD; R. Talbert, MD; L. Michaud, MD; C. Mehlman, MD; D. Kinnett, MD; S. Foad, MD; B. Schnell, MD; S. Salisbury, MD
  EMG and MRI are independently related to shoulder external rotation function in neonatal brachial plexus palsy

Radiology; Surgery; Hematology/Oncology » T. Loar, MD; B. Weiss, MD; R. Dasgupta, MD; M. Gelfand, MD; J. Breneman, MD; R. Lavigne, MD; R. Elluru, MD; L. Wagner, MD
  Use of sentinel node biopsy for staging parameningeal rhabdomyosarcoma

Radiology; Pathology; Rheumatology » T. Loar, MD; P. Ladd, MD; K. Emery, MD; S. Salisbury, MD; D. Lovell, MD; K. Bove, MD
  Juvenile dermatomyositis

Radiology; Orthopedics » T. Loar, MD; W. Lippert, MD; M Foad, MD; R. Cornwall, MD; C. Mehlman, MD
  Intra- and inter-rater reliability of glenoid version and glenohumeral subluxation measurements in neonatal brachial plexus palsy

Radiology; Pathology » T. Loar, MD; J. Stanek, MD; J. Leach, MD
  Diprosopus tetraophthalmos: computed tomography as a complement to autopsy

Radiology; Orthopedics » T. Loar, MD; B. Reading, MD; S. Salisbury, MD; R. Cornwall, MD; W. Lippert, MD
  Quantification of humeral head deformity following neonatal brachial plexus palsy

Radiology; Rheumatology » T. Loar, MD; A. Brown, MD; C. Kwoh, MD; H. Hirsch, MD
  Patients with juvenile idiopathic arthritis in clinical remission have evidence of persistent inflammation revealed by 3T MRI

Radiology; Orthopedics » T. Loar, MD; E. Wall, MD; A. Zbojniewicz, MD
  Juvenile pediatric intercenter treatment of osteochondritis dissecans and osteoarthritis research

Radiology; Neurosurgery » J. Leach, MD; F. Mangana, DO
Imaging and Treatment of pediatric epilepsy; imaging and pathology correlations in pediatric cortical dysplasia; operative neuronavigation in pediatric neurosurgery; SMA syndrome after operative resection in the frontal lobes

Radiology; Oncology  »  J. Leach, MD; M. Fouladi, MD
   High grade glioma imaging and treatment correlations; Imaging of diffuse brainstem glioma and treatment responses

Radiology; Neurology  »  J. Leach, MD; H. Greiner, MD; K. Holland, MD; D. Rose, MD;
   Imaging and treatment of pediatric epilepsy

Radiology; Neurology  »  J. Leach, MD; D. Franz, MD; D. Kreuger, MD; J. Mandelt-Tillema, MD
   Everolimus alters white matter diffusion in tuberous sclerosis complexes. DTI study.

Radiology; Oncology  »  J. Leach, MD; J. Geller, MD
   A pilot study of intra-ophthalmic artery topotecan infusion for the treatment of retinoblasoma

Radiology; Neurology  »  J. Leach, MD; L. Lehman, MD; M. Kabouche, MD
   Pediatric stroke

Radiology; Neurology  »  J. Leach, MD; J. Mandelt-Tillema, MD
   DTI analyses in pediatric multiple sclerosis and demyelinating disorders; DTI analyses in tuberous sclerosis

Radiology; Neonatology  »  J. Leach, MD; B. Kline-Fath; S. Merhar, MD
   Imaging findings in Twin-twin transfusion syndrome

Radiology; Psychology; Emergency Medicine; Radiology Imaging Research Center; PNRC  »  J. Leach, MD; S. Wade, PhD
   Imaging and neurobehavioral outcomes in traumatic brain injury

Radiology; Emergency Medicine  »  J. Leach, MD; L. Babcock-Cimpello, MD
   Defining axonal injury in children with mild traumatic brain injury

Radiology; Pathology  »  J. Leach, MD; L. Miles, MD
   Imaging/pathology correlations in pediatric cortical dysplasia

Radiology; Center for Safe and Healthy Children  »  J. Leach, MD; M. Greiner, MD
   Does macrocephaly and enlargement of the subarachnoid spaces predispose children to subdural hematomas?

Radiology; Anesthesia; Oncology  »  J. Leach, MD; T. Abruzzo, MD; M. Patino, MD; J. Geller, MD
   Reversible cerebral vasoconstriction syndrome (RCVS) associated with the administration of vasoconstrictors and antihistaminics to a toddler

Radiology Imaging Research Center; Developmental Biology  »  D. Lindquist, PhD; A. Kuan, MD, PhD
   Mouse models of hypoxia/ischemia and treatment effects

Radiology Imaging Research Center; Developmental Biology  »  D. Lindquist, PhD; R. Waclaw, PhD
   Mouse models of abnormal white matter development

Radiology Imaging Research Center; Hematology/Oncology  »  D. Lindquist, PhD; N. Ratner, PhD; D. Mayes, PhD; E. Jousma, PhD; J. Wu, PhD
   Mouse models of neurofibromatosis I

Radiology Imaging Research Center; Developmental Biology  »  D. Lindquist, PhD; J. Wells, PhD
   Early detection of pancreatic cancer
Radiology Imaging Research Center; Nephrology » D. Lindquist, PhD; J. Wansapura, PhD; M. Mitsnesfes, MD
Cardiac dysfunction in dialysis and kidney transplant patients

Radiology Imaging Research Center; Neurosurgery » D. Lindquist, PhD; F. Mangano, MD; W. Yuan, PhD
Animal models of hydrocephalus

Radiology Imaging Research Center; Hematology/Oncology » D. Lindquist, PhD; B. DasGupta, MD
AMPK signaling

Radiology Imaging Research Center; Neurology » D. Lindquist, PhD; M. Skelton, MD
Effects of whole-body creatine transporter deficiency

Radiology Imaging Research Center; Developmental Biology » D. Lindquist, PhD; M. Nakafuku, PhD
Mouse models of white matter damage following hypoxia-ischemia

Radiology Imaging Research Center; Molecular Cardiovascular Biology » D. Lindquist, PhD; Z. Khuchua, PhD
Mouse models of Barth Syndrome

Radiology Imaging Research Center; Otolaryngology » D. Lindquist, PhD; D. Choo, MD
Intratypmanic antivirals for CMV related hearing loss

Radiology Imaging Research Center; Exp. Hematology Cancer Biology » D. Lindquist, PhD; Q. Pang, PhD
Role of FA proteins in hematopoiesis

Radiology; Pediatric Pathology » A. Oestreich, MD; B. Vaughan, MD
Radiographs of fetuses and stillborns

Radiology; Genetics » A. Oestreich, MD; B. Tinkle, MD
Dysplasias

Radiology; Orthopedics » A. Oestreich, MD; A. Crawford, MD
Idiopathic scoliosis: the Harms Study Group Treatment Guide

Radiology; Adolescent Medicine » S. O'Hara, MD; J. Huppert, MD
Ovarian torsion retrospective project and long term follow-up

Radiology; Hematology » S. O'Hara, MD; T. Kalfa, MD
TCD with Transfusions Changing to Hydroxyurea (TWITCH): a phase III randomized clinical trial to compare standard therapy (erythrocyte transfusions) with alternative therapy (hydroxyurea) for the maintenance of lowered TCD velocities in pediatric subjects with sickle cell anemia and abnormal pre-treatment TCD velocities.

Radiology; Hematology/Oncology » M. Patel, DO; D. Adams, MD
Rapamycin for the treatment of complex vascular malformations

Radiology; Gastroenterology » D. Podberesky, MD; T. Denson, MD
Evaluation of CT and MR enterography in children

Radiology; Cardiology » D. Podberesky, MD; M. Taylor, MD; K. Hor, MD
Evaluation of MRI in pectus excavatum patients

Radiology; Radiology Imaging Research Center; Pediatric Surgery » J. Racadio, MD; M. Patel, MD; N. Johnson, MD; K. Kukreja, MD; R. Nachabe; D. Babic; D. VonAllmen, MD
Dedicated animal research interventional radiology suite: Philips state-of-the-art Allura FD20 angiointerventional system. Installation in Imaging Research Center

Radiology; Oncology » J. Racadio, MD; M. Patel, MD; K. Kukreja, MD; N. Johnson, MD; T. Cripe, MD
Herpes Simplex Virus-1 Mutant HSV1716 image guided injection into patients with refractory solid tumor.

Radiology; Gastroenterology » J. Racadio, MD; M. Patel, MD; K. Kukreja, MD; N. Johnson, MD; S. Xanthalos, MD

NASH (Non Alcoholic Steato Hepatitis): IR performs image guided liver biopsies on obese teens.

Radiology; Hematology/Oncology » J. Racadio, MD; M. Patel, MD; K. Kukreja, MD; N. Johnson, MD; R. Kohli, MD

Iron overload in Sickle Cell: IR performs image guided liver biopsies.

Radiology; Nephrology » J. Racadio, MD; M. Patel, MD; K. Kukreja, MD; N. Johnson, MD; F. Strife, MD; M. Mitsnesfes, MD

Renal/vascular hypertension in children: angiography and percutaneous balloon angioplasty

Radiology; Radiology Imaging Research Center » J. Racadio, MD; M. Patel, MD; K. Kukreja, MD; N. Johnson, MD; C. Dumoulin, PhD

MR-guided intervention

Radiology; Oncology » S. Sharp, MD; M. Gelfand, MD; M. Absalon

Altered FDG uptake patterns in pediatric lymphoblastic lymphoma patients receiving induction chemotherapy that includes very high dose corticosteroids

Radiology; Nephrology » A. Towbin, MD; D. Petry, RT; J. Bissler, MD

Novartis CRAD001M2302 Trial - Phase 3 trial evaluating the use of everolimus for the treatment of angiomyolipomas in patients with Tuberous Sclerosis

Radiology; Oncology » A. Towbin, MD; K. Kukreja, MD; M. Patel, MD; N. Johnson, MD; J. Racadio, MD; T. Cripe, MD

HSV 1716 intra-tumoral injection study - Phase 1 trial evaluating the safety of a recombinant herpes virus injection in treating solid tumors

Radiology; Oncology » A. Towbin, MD; K. Kukreja, MD; M. Patel, MD; N. Johnson, MD; J. Racadio, MD; T. Cripe, MD

Jennerex JX-594 Intra-tumoral Injection Study - Phase 1 trial evaluating the safety of an intratumoral injection of a recombinant vaccinia virus in treating solid tumors

Radiology; Pathology; Oncology » A. Towbin, MD; M. Collins, MD; J. Perentesis, MD; R. Nagarajan, MD

INI1 and mib-1 Expression in Childhood Chordoma - Retrospective study evaluating childhood chordoma at CCHMC

Radiology; Oncology » A. Towbin, MD; T. Hummel, MD; B. Weiss, MD

Response of NF1 related plexiform neurofibroma to high dose carboplatin. Case report.

Radiology; Oncology » A. Towbin, MD; A. Meyers, MD; S. Serai, PhD; D. Podberesky, MD; J. Geller, MD

Characterization of pediatric liver lesions with gadoxetate disodium - evaluation of liver tumors in children using a novel contrast agent

Radiology; Surgery; Oncology » A. Towbin, MD; K. Kukreja, MD; G. Tiao, MD; J. Geller, MD

Early chemotherapy response and identification of liver transplant candidates in patients with unresectable hepatoblastoma

Radiology; Gastroenterology » A. Towbin, MD; D. Podberesky, MD; L. Denson, MD; C. Dykes, MD

Biomarkers for Inflammatory Bowel Disease and Treatment Response - Clinical trial evaluating the ability of CT and MR enterography to detect inflammatory bowel disease and comparing it to lab values and
endoscopy findings

Radiology; Gastroenterology » A. Towbin, MD; L. Diniz, MD; P. Putnam, MD
Radiographic Findings in Eosinophilic Esophagitis - Retrospective study evaluating the fluroscopic findings in patients with eosinophilic esophagitis

Radiology; Pathology » A. Towbin, MD; J. Mo, MD
Focal Nodular Hyperplasia in Children, Adolescents and Young Adults - Evaluation of pathologically-proven FNH at CCHMC

Radiology; Emergency Medicine; Surgery » A. Towbin, MD; A. Spooner, MD; C. Showalter, MD; H. Brodzinski, MD; E. Alessandri, MD; D. von Allmen, MD
Risk Stratification to Efficiently Diagnose Appendicitis - Prospective study evaluating the use of a clinical pathway in helping to efficiently diagnose patients with appendicitis

Radiology Imaging Research Center; Developmental Biology » P. Winter, PhD; A. Kuan, MD
Use of iron oxide nanoparticles for tracking the activation and infiltration of immune cells during cerebral infarction

Radiology Imaging Research Center; Neonatology; Pulmonary Biology » P. Winter, PhD; A. Jobe, MD
Use of MRI contrast agents for imaging the distribution of surfactant in the lung

Radiology; Orthopedics » A. Zbojniewicz, MD; S. Pairkh, MD
Intracapsular origin of the long head of the biceps tendon with glenoid avulsion of glenohumeral ligaments

Faculty Members

Lane F. Donnelly, MD, Professor
Director and Radiologist-in-Chief, (until February 1, 2011)
Endowed Chair, The Frederic N. Silverman Chair for Pediatric Radiology
Research Interests MR sleep studies, imaging care delivery, quality improvement, and patient safety

Bernadette L. Koch, M.D., Associate Professor
Interim Radiologist-in-chief (2/1/11-8/1/11), Associate Director, Physician Services and Education
Research Interests Imaging the pediatric head and neck, with particular interest in evaluating children with problems involving the face, orbits, sinuses, ears, airway and/or n

Todd A. Abruzzo, MD, Associate Professor
Research Interests Cerebrovascular disease, childhood stroke, aneurysms, intra-arterial chemotherapies, vascular malformations, neurovascular interventions

Christopher G. Anton, MD, Assistant Professor
Division Co-Chief CT
Associate Director, Radiology Residency Program
Research Interests Musculoskeletal diseases.

Diane S. Babcock, MD, Professor Emeritus
Research Interests

Williams S. Ball, MD, Professor
Research Interests Childhood stroke, neoplasms, sickle cell disease, brain perfusion imaging

Alan S. Brody, MD, Professor
Associate Director, Radiology Research Chief, Division of Thoracic Imaging
Research Interests Imaging of the chest in cystic fibrosis and in childhood diffuse lung disease. He directs
the Center for Diagnostic Imaging of the Therapeutic Development Network

Maria A. Calvo, MD, Assistant Professor  
**Research Interests** Fetal development and malformations including cloaca and other ano-rectal malformations, obstructive uropathy, skeletal dysplasias, vascular birthmarks, etc

Marquerite M. Care, MD, Assistant Professor  
**Research Interests** Traumatic brain injury, child abuse, CT neuroimaging

Kim M. Cecil, PhD, Professor  
**Research Interests** Application of MR spectroscopy and imaging in several populations by characterizing the features of inborn errors in metabolism and evaluating the effects of

Eric J. Crotty, MD, Assistant Professor  
*Director, Pediatric Radiology Fellowship Program*  
**Research Interests** Cardiothoracic radiology, specifically childhood interstitial lung disease and also resident education

Mark DiFrancesco, PhD, Assistant Professor  
*Assistant Director, Pediatric Neuroimaging Research Consortium*  
**Research Interests** Imaging structure and function of brain networks impacted by behavioral and disease-related challenges

Charles L. Dumoulin, PhD, Professor  
*IRC Scientific Director, Imaging Research Center*  
**Research Interests** Physics and engineering of Magnetic Resonance, MRI of neonates, and interventional MRI. His interests in interventional MR include: MR-guided Focused

John C. Egelhoff, DO, Professor  
*Division Co-Chief, CT*  
**Research Interests** Spine, CT dose reduction and temporal bone

Kathleen H. Emery, MD, Professor  
*Division Co-Chief, MRI*  
*Division Co-Chief, Musculoskeletal Imaging*  
**Research Interests**

Robert J. Fleck, MD, Assistant Professor  
*Division Chief, Cardiac MRI*  
**Research Interests** CT and MR of the cardiopulmonary system.

Michael J. Gelfand, MD, Professor  
*Division Chief, Nuclear Medicine*  
**Research Interests** New applications of hybrid imaging (PET/CT, SPECT/CT, PET/MRI) in pediatrics, and radiation dose reduction in nuclear medicine and hybrid imaging.

Randy O. Giaquinto, Instructor  
**Research Interests**

Marilyn J. Goske, MD, Professor  
*Chair, Educational Council*  
*Endowed Chair, The Corning Benton Chair for Radiology Education*  
**Research Interests** Radiation protection for children, communication of radiation risk to families, practice quality improvement related to imaging in children, patient care and communication

Carolina Guimaraes, MD, Instructor  
**Research Interests** Fetal imaging and pediatric neuroradiology.
Kathy J. Helton-Skally, MD, Assistant Professor

Research Interests

Scott Holland, PhD, Professor

Director, Pediatric Neuroimaging Research Consortium

Research Interests Advanced neuroimaging applications of MRI in pediatrics with a concentration on functional MRI of language, hearing and computational models of neural connectivity

Neil D. Johnson, MD, Professor

Endowed Chair, The Neil D. Johnson Chair for Radiology Informatics

Research Interests Interventional percutaneous image guided treatment of benign bone tumors such as Aneurysmal Bone Cyst and Osteoid Osteoma

Blaise V. Jones, MD, Professor

Director of Clinical Services
Division Chief, Neuroradiology
Division Co-Chief, MRI

Research Interests Brain neoplasms and cerebrovascular diseases.

Hee Kyung Kim, MD, Instructor

Research Interests

Beth M. Kline-Fath, MD, Associate Professor

Division Chief, Fetal Imaging

Research Interests Fetal MRI, fetal ultrasound and neuroimaging

Marcia Komlos, Instructor

Research Interests

Steven J. Kraus, MD, Associate Professor

Division Chief, Radiography and Fluoroscopy

Research Interests

Kamlesh U. Kukreja, MD, Instructor

Research Interests Vascular interventions (Arterial and venous thrombolysis, IVC filters, renal artery angioplasty)

David Larson, MD, Assistant Professor

Chief, Quality Improvement
Endowed Chair, The Janet L. Strife Chair for Radiology Quality & Safety

Research Interests Healthcare Quality Improvement, Patient Safety, CT Dose Reduction and Image Optimization

Tal Laor, MD, Professor

Division Co-Chief Musculoskeletal Imaging
Endowed Chair, The William S. Ball Chair for Radiology Research

Research Interests Skeletal injuries to the child, congenital abnormalities, and normal and abnormal bone growth and development.

James L. Leach, MD, Associate Professor

Research Interests Epilepsy, functional MRI, neoplasms, cerebrovascular disease, brain perfusion imaging, diffusion imaging and image fusion

Diana Lindquist, PhD, Assistant Professor

Research Interests Metabolic effects of drugs used to treat psychiatric illness

Yu Li, PhD, Assistant Professor
Research Interests  Technological development and clinical applications of high speed MR imaging and spectroscopy. Specifically, Dr. Li is interested in RF coil array for clinical MRI

Carl (Arnold) Merrow, Jr, M.D., Assistant Professor
Research Interests  Pediatric musculoskeletal and fetal imaging. Particular areas of concentration include musculoskeletal neoplasms and vascular lesions, rheumatologic imaging, so

Michael P. Nasser, MD, Assistant Professor
Research Interests

Alan E. Oestreich, MD, Professor
Research Interests

Sara M. O'Hara, MD, Associate Professor
Division Chief, Ultrasound
Research Interests  Cutting edge ultrasound techniques and equipment, genitourinary imaging, and newborn imaging

Manish N. Patel, MD, Assistant Professor
Research Interests  Diagnosis and treatment of vascular malformation, pediatric PICC placement, and pre-operative evaluation of patient with anorectal malformation

Daniel J. Podberesky, MD, Assistant Professor
Division Chief, Thoraco-Abdominal Imaging
Research Interests  Optimization of CT radiation dose and image quality, advanced CT and MR of the gastrointestinal

John M. Racadio, MD, Associate Professor
Division Chief, Interventional Radiology
Research Interests  Viral oncolytic therapy, 3D image fusion and intervention and Radiation Safety

Mantosh Rattan, MD, Assistant Professor
Research Interests

Susan E. Sharp, MD, Assistant Professor
Research Interests  Pediatric nuclear medicine, focusing on SPECT/CT and PET/CT.

Janet L. Strife, MD, Professor Emeritus
Research Interests  Obesity, Patient Safety and Airway Obstruction in Children

Vincent J. Schmithorst, PhD, Associate Professor
Research Interests  Neuroimaging of children with hearing loss and auditory processing disorders

Jean Tkach, PhD, Associate Professor
Research Interests  Development, implementation and optimization of MRI acquisition techniques optimized for and to best address the most relevant clinical needs of the neonatal population

Alexander J. Towbin, MD, Assistant Professor
Director, Radiology Informatics
Research Interests  Radiology informatics; cancer imaging and abdominal imaging

Janaka Wansapura, PhD, Assistant Professor
Research Interests  MR imaging of familial cardiomyopathy in human and in transgenic animal models; vascular compliance, MR guided thermo-therapy and fat/water decomposition

Patrick Winter, PhD, Assistant Professor
Research Interests  Molecular imaging of cancer and cardiovascular disease, multi-nuclear imaging and
spectroscopy, tracking USPIO labeled cell migration, and activatable MRI contrast agents

Weihong Yuan, PhD, Assistant Professor

Research Interests Diffusion tensor imaging in clinical and experimental hydrocephalus and application of various imaging techniques in children with traumatic brain injury, epilepsy and other neurological disorders

Andrew M. Zbojniewicz, MD, Assistant Professor

Research Interests Musculoskeletal radiology

Joint Appointment Faculty Members

Michael Taylor, MD, Assistant Professor
Cardiology

Jennifer J. Vannest, PhD, Assistant Professor
Neurology
Research Interests Neuroimaging of language development and language function in neurological disorders

Clinical Staff Members

- Suraj Serai, PhD, Clinical MR Physicist

Trainees

- Krista L. Birkemeier, MD, PL6, Scott & White Memorial Hospital, Temple TX
- Kimberly A. Dannull, MD, PL6, Baptist Memorial Hospital, Memphis TX
- Lincoln O. Diniz, MD, PL6, Goa Medical College, Bambolim-Goa, India
- Asef B. Khwaja, MD, PL6, University of Maryland, Baltimore MD
- Arthur B. Meyers, MD, PL6, Yale New Haven Hospital, New Haven, Ct
- Jeremy T. Neuman, MD, PL6, Staten Island University Hospital, Staten Island NY
- Ethan A. Smith, MD, PL6, University of Michigan, Ann Arbor MI
- Daniel B. Wallihan, MD, PL6, University of Cincinnati Hospital, Cincinnati OH
- Lily L. Wang, MD, PL6, Prince of Wales/Sydney Children’s Hospitals, Randwick, Australia
- Sumeda Abeykoon, MS, University of Cincinnati Department of Physics, Cincinnati, OH
- Travis Beckwich, , University of Cincinnati Neuroscience, Cincinnati, OH
- Hailong Li, B.S, M.S., PGY8, University of Cincinnati, Computer Science Department, Cincinnati, Ohio
- Monwabisi Makola, , University of Cincinnati College of Medicine, Cincinnati, OH
- Duke Shereen, PhD, University of Cincinnati, Cincinnati Ohio

Significant Accomplishments

Radiation Dose Reduction – Image Gently

Medical imaging using ionizing radiation has increased fivefold since 1986 in the United States. This poses a potential health risk to the pediatric population, especially when children are imaged using an adult dose rather than a child-sized dose. The Alliance for Radiation Safety in Pediatric Imaging was formed in 2007, led by one of our radiology faculty, to help improve safety. The alliance now involves more than 62 organizations, including the American Academy of Pediatrics, the International Atomic Energy Agency and the World Health Organization. The mission of the Image Gently campaign is to promote radiation protection worldwide and to improve safety through education, awareness and advocacy. The alliance sponsors a widely
used website (www.imagegently.org) that contains free instructional materials for medical professionals and parents. Many Cincinnati Children’s radiology faculty are involved in this initiative to decrease radiation exposure to children undergoing X-rays, CT scans, fluoroscopy, interventional procedures and nuclear medicine procedures. The campaign has been recognized by the Food and Drug Administration and has worked with the Agency for Healthcare Research and Quality to child-size the radiation dose in CT scans for children. Recently, an adult campaign was created, “Image Wisely,” sponsored by the Radiological Society of North America and the American College of Radiology.

New Neonate MRI
Imaging scientists in the Department of Radiology have developed a new type of magnetic resonance (MR) scanner for premature babies. The new scanner combines a small magnet designed for adult orthopaedic use, with state-of-the-art imaging electronics, custom-built patient handling systems and an MR-compatible incubator. It is lighter, less expensive and has a much smaller footprint than conventional MR scanners, without compromising imaging performance. It is small enough to place inside the Neonatal Intensive Care Unit (NICU) and overcomes the logistical challenges of moving fragile babies between the NICU and the Radiology Department. Early results with the research prototype system were presented in the 2011 meeting of the Joint Societies of Pediatric Radiology in London, where our team won the Caffey Award for best basic science paper. Installation of a second scanner in the NICU is scheduled for the end of 2011. This clinical scanner will be used for routine imaging and groundbreaking clinical research with colleagues from the Perinatal Institute and the Division of Developmental Biology. This new approach to neonatal MRI promises to provide premature babies routine access to the full breadth of modern MR, and will offer new objective metrics for patient management of many clinical conditions.

Report Turnaround Times Reduced
Multiple IT initiatives have been developed and implemented to improve report turnaround times. These include implementation of 24/7 overnight faculty coverage and use of standardized reports. Our current average turnaround time for Emergency Department and stat films is less than 30 minutes. In addition, a real-time radiology dashboard was created to track turnaround times, volumes of undictated and dictated studies, as well as days since the last MRI safety incident.

Division Publications


31. Harnsberger HR, Glastonbury CM, Michel MA, Koch BL. Diagnostic imaging. Head and neck. [Salt Lake City, Utah]; Amirsys.


Grants, Contracts, and Industry Agreements

<table>
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<tr>
<th>Grant and Contract Awards</th>
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<td>Early Lead Exposure, ADHD and Persistent Criminality: Role of Genes and Environment</td>
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<td>MR-Guided Focused Ultrasound Ablation of Visceral Fat: A New Treatment for Metabolic Syndrome</td>
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<td><strong>fMRI of Normal Language Development in Children</strong></td>
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**Industry Contracts**

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**Current Year Direct**

Total $2,922,071

**Current Year Direct Receipts**

Total $458

**Total**

Total $2,922,529