Cincinnati Children's

2015 Research Annual Report

Radiology

RESEARCH AND TRAINING DETAILS

Click to view members

Faculty	**46**
Joint Appointment Faculty	**8**
Research Students	**8**
Support Personnel	**52**
Direct Annual Grant Support	**$482,302**
Direct Annual Industry Support	**$79,184**
Peer Reviewed Publications	**140**

CLINICAL ACTIVITIES AND TRAINING

Clinical Staff	**249**
Staff Physicians	**36**
Clinical Fellows	**11**
Other Students	**84**
Inpatient Encounters	**54,817**
Outpatient Encounters	**154,706**

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Division Publications

1. Adeoye O, Albright KC, Carr BG, Wolff C, Mullen MT, Abruzzo T, Ringer A, Khatri P, Branas C, Kleindorfer D. **Geographic access to acute stroke care in the United States**. *Stroke*. 2014; 45:3019-24.

2. Ahmed A, Towbin RB, Towbin AJ. **Traumatic Abdominal Wall Hernia**. *Applied Radiology*. 2015; .

3. Aly N, Towbin AJ, Towbin RB. **Pediatric Radiological Case: Diastematomyelia**. *Applied Radiology*. 2014; .

4. Anupindi SA, Podberesky DJ, Towbin AJ, Courtier J, Gee MS, Darge K, Dillman JR. **Pediatric inflammatory bowel disease: Imaging issues with targeted solutions**. *Abdom Imaging*. 2015; 40:975-92.

5. Aquino MR, Tse SM, Gupta S, Rachlis AC, Stimec J. **Whole-body MRI of juvenile spondyloarthritis: protocols and pictorial review of characteristic patterns**. *Pediatr Radiol*. 2015; 45:754-62.

6. Backeljauw B, Holland SK, Altaye M, Loepke AW. **Cognition and Brain Structure Following Early Childhood Surgery With Anesthesia**. *Pediatrics*. 2015; 136:e1-e12.

7. Bebko G, Bertocci M, Chase H, Dwojak A, Bonar L, Almeida J, Perlman SB, Versace A, Schirda C, Travis M, Gill MK, Demeter C, Diwadkar V, Sunshine J, Holland S, Kowatch R, Birmaher B, Axelson D, Horwitz S, Frazier T, Arnold LE, Fristad M, Youngstrom E, Findling R, Phillips ML. **Decreased amygdala-insula resting state connectivity in behaviorally and emotionally dysregulated youth**. *Psychiatry Res*. 2015; 231:77-86.

8. Bertocci MA, Bebko G, Olino T, Fournier J, Hinze AK, Bonar L, Almeida JR, Perlman SB, Versace A, Travis M, Gill MK, Demeter C, Diwadkar VA, White R, Schirda C, Sunshine JL, Arnold LE, Holland SK, Kowatch RA, Birmaher B, Axelson D, Youngstrom EA, Findling RL, Horwitz SM, Fristad MA, Phillips ML. **Behavioral and emotional dysregulation trajectories marked by prefrontal-amygdala function in symptomatic youth**. *Psychol Med*. 2014; 44:2603-15.

9. Bixenmann BJ, Kline-Fath BM, Bierbrauer KS, Bansal D. **Prenatal and postnatal evaluation for syringomyelia in patients with spinal dysraphism**. *J Neurosurg Pediatr*. 2014; 14:316-21.

10. Brody AS, Guillerman RP. **Don't let radiation scare trump patient care: 10 ways you can harm your patients by fear of radiation-induced cancer from diagnostic imaging**. *Thorax*. 2014; 69:782-4.

11. Bunt CW, Burke HB, Towbin AJ, Hoang A, Stephens MB, Fontelo P, Liu F, Gimbel RW. **Point-of-Care Estimated Radiation Exposure and Imaging Guidelines Can Reduce Pediatric Radiation Burden**. *J Am Board Fam Med*. 2015; 28:343-50.

12. Calder AD, Bush A, Brody AS, Owens CM. **Scoring of chest CT in children with cystic fibrosis: state of the art**. *Pediatr Radiol*. 2014; 44:1496-506.

13. Callahan MJ, Kleinman PL, Strauss KJ, Bandos A, Taylor GA, Tsai A, Kleinman PK. **Pediatric CT dose reduction for suspected appendicitis: a practice quality improvement project using artificial Gaussian noise--part 1, computer simulations**. *AJR Am J Roentgenol*. 2015; 204:W86-94.

14. Calvo-Garcia MA. **Genitourinary Abnormalities: Complex Urogenital and Anorectal Malformations**. In: BM Kline-Fath, DI Bulas, R Bahado-Singh, eds. *Fundamental and Advanced Fetal Imaging : Ultrasound and MRI*. Philadelphia, PA: Wolters Kluwer Health; 2015:701-711.

15. Cebula H, Kurbanov A, Zimmer LA, Poczos P, Leach JL, De Battista JC, Froelich S, Theodosopoulos PV, Keller JT. **Endoscopic, endonasal variability in the anatomy of the internal carotid artery**. *World Neurosurg*. 2014; 82:e759-

64.

16. Cecil KM, Mulkey SB, Ou X, Glasier CM. **Brain ketones detected by proton magnetic resonance spectroscopy in an infant with Ohtahara syndrome treated with ketogenic diet**. *Pediatr Radiol*. 2015; 45:133-7.

17. Chen Y, Lee GR, Wright KL, Badve C, Nakamoto D, Yu A, Schluchter MD, Griswold MA, Seiberlich N, Gulani V. **Free-breathing liver perfusion imaging using 3-dimensional through-time spiral generalized autocalibrating partially parallel acquisition acceleration**. *Invest Radiol*. 2015; 50:367-75.

18. Clark JF, Cecil KM. **Diagnostic methods and recommendations for the cerebral creatine deficiency syndromes**. *Pediatr Res*. 2015; 77:398-405.

19. Clauss SB, Pike JJ, Calvo-Garcia MA, Donofrio MT. **Cardiac Anomalies**. In: BM Kline-Fath, DI Bulas, R Bahado-Singh, eds. *Fundamental and Advanced Fetal Imaging : Ultrasound and MRI*. Philadelphia, PA: Wolters Kluwer Health; 2015:540-572.

20. Coleman A, Phithakwatchara N, Shaaban A, Keswani S, Kline-Fath B, Kingma P, Haberman B, Lim FY. **Fetal lung growth represented by longitudinal changes in MRI-derived fetal lung volume parameters predicts survival in isolated left-sided congenital diaphragmatic hernia**. *Prenat Diagn*. 2015; 35:160-6.

21. Constantino K, Patel M, Jorgensen SA, Towbin AJ, Dickman P, Towbin RB. **Endobronchial Carcinoid**. *Applied Radiology*. 2015; .

22. Cornejo P, Jorgensen S, Naidu P, Towbin AJ. **Pediatric Radiological Case: Pelizaeus-Merzbacher syndrome**. *Applied Radiology*. 2014; .

23. Cornejo P, Jorgensen S, Towbin AJ, Towbin RB. **Pediatric Radiological Case: Pancreatoblastoma**. *Applied Radiology*. 2014; .

24. Cost NG, DeFoor WR, Jr., Crotty EJ, Geller JI. **The initial experience with RENAL Nephrometry in children, adolescents, and young adults with renal tumors**. *Pediatr Blood Cancer*. 2014; 61:1434-9.

25. Coyne SM, Zhang B, Trout AT. **Does appendiceal diameter change with age? A sonographic study**. *AJR Am J Roentgenol*. 2014; 203:1120-6.

26. Cripe TP, Ngo MC, Geller JI, Louis CU, Currier MA, Racadio JM, Towbin AJ, Rooney CM, Pelusio A, Moon A, Hwang TH, Burke JM, Bell JC, Kirn DH, Breitbach CJ. **Phase 1 study of intratumoral Pexa-Vec (JX-594), an oncolytic and immunotherapeutic vaccinia virus, in pediatric cancer patients**. *Mol Ther*. 2015; 23:602-8.

27. Dandoy CE, Kukreja KU, Gruppo RA, Patel MN, Tarango C. **Outcomes in children with deep vein thrombosis managed with percutaneous endovascular thrombolysis**. *Pediatr Radiol*. 2015; 45:719-26.

28. Dao TV, Beydoun T, Jorgensen S, Towbin AJ, Towbin R. **Pediatric Radiological Case: Superior mesenteric artery compression syndrome**. *Applied Radiology*. 2014; .

29. Das A, Wansapura JP, Gottliebson WM, Banerjee RK. **Methodology for implementing patient-specific spatial boundary condition during a cardiac cycle from phase-contrast MRI for hemodynamic assessment**. *Med Image Anal*. 2015; 19:121-36.

30. DePowell JJ, Froelich SC, Zimmer LA, Leach JL, Karkas A, Theodosopoulos PV, Keller JT. **Segments of the internal carotid artery during endoscopic transnasal and open cranial approaches: can a uniform nomenclature apply to both?**. *World Neurosurg*. 2014; 82:S66-71.

31. Eismann EA, Little KJ, Laor T, Cornwall R. **Glenohumeral abduction contracture in children with unresolved neonatal brachial plexus palsy**. *J Bone Joint Surg Am*. 2015; 97:112-8.

32. Eismann EA, Stephan ZA, Mehlman CT, Denning J, Mehlman T, Parikh SN, Tamai J, Zbojniewicz A. **Pediatric Triplane Ankle Fractures: Impact of Radiographs and Computed Tomography on Fracture Classification and Treatment Planning**. *J Bone Joint Surg Am*. 2015; 97:995-1002.

33. Fader LM, Laor T, Eismann EA, Cornwall R, Little KJ. **MR imaging of capitellar ossification: a study in children of different ages**. *Pediatr Radiol*. 2014; 44:963-70.

34. Fahey F, Zukotynski K, Zurakowski D, Markelewicz R, Falone A, Vitello M, Cao X, Grant F, Drubach L, Vija AH, Bhattacharya M, Ding X, Bar-Sever Z, Gelfand M, Treves ST. **Beyond current guidelines: reduction in minimum administered radiopharmaceutical activity with preserved diagnostic image quality in pediatric hepatobiliary scintigraphy**. *Eur J Nucl Med Mol Imaging*. 2014; 41:2346-53.

35. Farah R, Schmithorst VJ, Keith RW, Holland SK. **Altered white matter microstructure underlies listening difficulties in children suspected of auditory processing disorders: a DTI study**. *Brain Behav*. 2014; 4:531-43.

36. Fleck RJ, Amin RS, Shott SR, Mahmoud MA. **MRI sleep studies: use of positive airway pressure support in patients with severe obstructive sleep apnea**. *Int J Pediatr Otorhinolaryngol*. 2014; 78:1163-6.

37. Frush DP, Goske MJ. **Image Gently: toward optimizing the practice of pediatric CT through resources and dialogue**. *Pediatr Radiol*. 2015; 45:471-5.

38. Gandhi CD, Bulsara KR, Fifi J, Kass-Hout T, Grant RA, Delgado Almandoz JE, English J, Meyers PM, Abruzzo T, Prestigiacomo CJ, Powers CJ, Lee SK, Albani B, Do HM, Eskey CJ, Patsalides A, Hetts S, Hussain MS, Ansari SA, Hirsch JA, Kelly M, Rasmussen P, Mack W, Pride GL, Alexander MJ, Jayaraman MV, Standards S, Guidelines C. **Platelet function inhibitors and platelet function testing in neurointerventional procedures**. *J Neurointerv Surg*. 2014; 6:567-77.

39. Gass D, Dewire M, Chow L, Rose SR, Lawson S, Stevenson C, Pai AL, Jones B, Sutton M, Lane A, Pruitt D, Fouladi M, Hummel TR. **Pediatric tectal plate gliomas: a review of clinical outcomes, endocrinopathies, and neuropsychological sequelae**. *J Neurooncol*. 2015; 122:169-77.

40. Gebhard RD, Goske MJ, Salisbury SR, Leopard AC, Hater DM. **Improving health literacy: use of an informational brochure improves parents' understanding of their child's fluoroscopic examination**. *AJR Am J Roentgenol*. 2015; 204:W95-W103.

41. Gelfand MJ, Gilday DL. **The Contribution of Nuclear Medicine to Chest Imaging**. In: P Garcia-Pena, RP Guillerman, eds. *Pediatric Chest Imaging*. New York: Springer; 2014:65-74.

42. Gelfand MJ, Sharp SE, Palumbo JS. **Selective CT for PET/CT: dose reduction in Langerhans cell histiocytosis**. *Pediatr Radiol*. 2015; 45:81-5.

43. Goske MJ. **Diagnostic reference ranges and the American College of Radiology Dose Index Registry: the pediatric experience**. *Pediatr Radiol*. 2014; 44 Suppl 3:506-10.

44. Grant FD, Gelfand MJ, Drubach LA, Treves ST, Fahey FH. **Radiation doses for pediatric nuclear medicine studies: comparing the North American consensus guidelines and the pediatric dosage card of the European Association of Nuclear Medicine**. *Pediatr Radiol*. 2015; 45:706-13.

45. Hafeman DM, Bebko G, Bertocci MA, Fournier JC, Bonar L, Perlman SB, Travis M, Gill MK, Diwadkar VA, Sunshine

JL, Holland SK, Kowatch RA, Birmaher B, Axelson D, Horwitz SM, Arnold LE, Fristad MA, Frazier TW, Youngstrom EA, Findling RL, Drevets W, Phillips ML. **Abnormal deactivation of the inferior frontal gyrus during implicit emotion processing in youth with bipolar disorder: attenuated by medication**. *J Psychiatr Res*. 2014; 58:129-36.

46. Hawkins CM, Hall S, Zhang B, Towbin AJ. **Creation and implementation of department-wide structured reports: an analysis of the impact on error rate in radiology reports**. *J Digit Imaging*. 2014; 27:581-7.

47. Haworth KJ, Weidner CR, Abruzzo TA, Shearn JT, Holland CK. **Mechanical properties and fibrin characteristics of endovascular coil-clot complexes: relevance to endovascular cerebral aneurysm repair paradigms**. *J Neurointerv Surg*. 2015; 7:291-6.

48. Horowitz-Kraus T, Cicchino N, Amiel M, Holland SK, Breznitz Z. **Reading improvement in English- and Hebrew-speaking children with reading difficulties after reading acceleration training**. *Ann Dyslexia*. 2014; 64:183-201.

49. Horowitz-Kraus T, Grainger M, DiFrancesco M, Vannest J, Holland SK, Consortium CA. **Right is not always wrong: DTI and fMRI evidence for the reliance of reading comprehension on language-comprehension networks in the right hemisphere**. *Brain Imaging Behav*. 2015; 9:19-31.

50. Horowitz-Kraus T, Holland SK. **Greater functional connectivity between reading and error-detection regions following training with the reading acceleration program in children with reading difficulties**. *Ann Dyslexia*. 2015; 65:1-23.

51. Horowitz-Kraus T, Vannest JJ, Gozdas E, Holland SK. **Greater Utilization of Neural-Circuits Related to Executive Functions is Associated with Better Reading: A Longitudinal fMRI Study Using the Verb Generation Task**. *Front Hum Neurosci*. 2014; 8:447.

52. Horowitz-Kraus T, Vannest JJ, Kadis D, Cicchino N, Wang YY, Holland SK. **Reading acceleration training changes brain circuitry in children with reading difficulties**. *Brain Behav*. 2014; 4:886-902.

53. Horowitz-Kraus T, Wang Y, Plante E, Holland SK. **Involvement of the right hemisphere in reading comprehension: a DTI study**. *Brain Res*. 2014; 1582:34-44.

54. Huby AC, Mendsaikhan U, Takagi K, Martherus R, Wansapura J, Gong N, Osinska H, James JF, Kramer K, Saito K, Robbins J, Khuchua Z, Towbin JA, Purevjav E. **Disturbance in Z-disk mechanosensitive proteins induced by a persistent mutant myopalladin causes familial restrictive cardiomyopathy**. *J Am Coll Cardiol*. 2014; 64:2765-76.

55. Jacola LM, Byars AW, Hickey F, Vannest J, Holland SK, Schapiro MB. **Functional magnetic resonance imaging of story listening in adolescents and young adults with Down syndrome: evidence for atypical neurodevelopment**. *J Intellect Disabil Res*. 2014; 58:892-902.

56. Jayaraman MV, Hussain MS, Abruzzo T, Albani B, Albuquerque FC, Alexander MJ, Ansari SA, Arthur AS, Baxter B, Bulsara KR, Chen M, Delgado-Almandoz JA, Fraser JF, Heck DV, Hetts SW, Kelly M, Lee SK, Leslie-Mawzi T, McTaggart RA, Meyers PM, Prestigiacomo C, Pride GL, Patsalides A, Starke RM, Tarr RW, Frei D, Rasmussen P, Standards, Guidelines Committee of the Society of NeuroInterventional S. **Embolectomy for stroke with emergent large vessel occlusion (ELVO): report of the Standards and Guidelines Committee of the Society of NeuroInterventional Surgery**. *J Neurointerv Surg*. 2015; 7:316-21.

57. Jeng MR, Fuh B, Blatt J, Gupta A, Merrow AC, Hammill A, Adams D. **Malignant transformation of infantile hemangioma to angiosarcoma: response to chemotherapy with bevacizumab**. *Pediatr Blood Cancer*. 2014; 61:2115-7.

58. Kaiser D, Leach J, Vannest J, Schapiro M, Holland S, Cincinnati MRIoNAC. **Unanticipated findings in pediatric**

neuroimaging research: prevalence of abnormalities and process for reporting and clinical follow-up. *Brain Imaging Behav*. 2015; 9:32-42.

59. Kim HK, Serai S. **Reply to Drs. Azzabou and Carlie regarding objective measurement of minimal fat in normal skeletal muscles of healthy children using T2 relaxation time mapping (T2 maps) and MR spectroscopy**. *Pediatr Radiol*. 2014; 44:1622-3.

60. Kline-Fath B. **Central Nervous System: Supratentorial Anomalies**. In: BM Kline-Fath, DI Bulas, R Bahado-Singh, eds. *Fundamental and Advanced Fetal Imaging : Ultrasound and MRI*. Philadelphia, PA: Wolters Kluwer Health; 2015:345-424.

61. Kline-Fath B. **Fetal Magnetic Resonance Imaging: Normal Brain Imaging**. In: BM Kline-Fath, DI Bulas, R Bahado-Singh, eds. *Fundamental and Advanced Fetal Imaging : Ultrasound and MRI*. Philadelphia, PA: Wolters Kluwer Health; 2015:184-220.

62. Kline-Fath B. **Neural Tube Defects: Cranium**. In: BM Kline-Fath, DI Bulas, R Bahado-Singh, eds. *Fundamental and Advanced Fetal Imaging : Ultrasound and MRI*. Philadelphia, PA: Wolters Kluwer Health; 2015:508-517.

63. Kline-Fath B. **The Thorax: Congenital Diaphragmatic Hernia**. In: BM Kline-Fath, DI Bulas, R Bahado-Singh, eds. *Fundamental and Advanced Fetal Imaging : Ultrasound and MRI*. Philadelphia, PA: Wolters Kluwer Health; 2015:583-596.

64. Kline-Fath BM, Bulas DI, Bahado-Singh R. *Fundamental and Advanced Fetal Imaging : Ultrasound and MRI*. Philadelphia, PA; Wolters Kluwer Health.

65. Koch BL. **Pediatric considerations in craniofacial trauma**. *Neuroimaging Clin N Am*. 2014; 24:513-29, viii.

66. Kolbe AB, Podberesky DJ, Zhang B, Towbin AJ. **The impact of hepatocyte phase imaging from infancy to young adulthood in patients with a known or suspected liver lesion**. *Pediatr Radiol*. 2015; 45:354-65.

67. Krishnamurthy VK, Evans AN, Wansapura JP, Osinska H, Maddy KE, Biechler SV, Narmoneva DA, Goodwin RL, Hinton RB. **Asymmetric cell-matrix and biomechanical abnormalities in elastin insufficiency induced aortopathy**. *Ann Biomed Eng*. 2014; 42:2014-28.

68. Kucera JN, Coley I, O'Hara S, Kosnik EJ, Coley BD. **The simple sacral dimple: diagnostic yield of ultrasound in neonates**. *Pediatr Radiol*. 2015; 45:211-6.

69. Kukreja KU, Lungren MP, Patel MN, Johnson ND, Racadio JM, Dandoy C, Tarango C. **Endovascular venous thrombolysis in children younger than 24 months**. *J Vasc Interv Radiol*. 2014; 25:1158-64.

70. Larson DB, Froehle CM, Johnson ND, Towbin AJ. **Communication in diagnostic radiology: meeting the challenges of complexity**. *AJR Am J Roentgenol*. 2014; 203:957-64.

71. Larson DB, Trout AT, Fierke SR, Towbin AJ. **Improvement in diagnostic accuracy of ultrasound of the pediatric appendix through the use of equivocal interpretive categories**. *AJR Am J Roentgenol*. 2015; 204:849-56.

72. Law CS, Douglass JM, Farman AG, White SC, Zeller GG, Lurie AG, Goske MJ. **The image gently in dentistry campaign: partnering with parents to promote the responsible use of x-rays in pediatric dentistry**. *Pediatr Dent*. 2014; 36:458-9.

73. Leach JL, Miles L, Henkel DM, Greiner HM, Kukreja MK, Holland KD, Rose DF, Zhang B, Mangano FT. **Magnetic resonance imaging abnormalities in the resection region correlate with histopathological type, gliosis extent, and postoperative outcome in pediatric cortical dysplasia**. *J Neurosurg Pediatr*. 2014; 14:68-80.

74. Lentini DE, Dishop MK, Brody AS, Oliva J, Millan LA. **Persistent Tachypnea in Infants by Hyperplasia of Pulmonary Neuroendrocrine Cells**. *Rev Asoc Med Argent*. 2015; 128:11-16.

75. Liem RI, Liu J, Gordon MO, Vendt BA, McKinstry RC, 3rd, Kraut MA, Strouse JJ, Ball WS, DeBaun MR. **Reproducibility of detecting silent cerebral infarcts in pediatric sickle cell anemia**. *J Child Neurol*. 2014; 29:1685-91.

76. Lungren MP, Patel MN. **Endovascular management of head and neck vascular malformations**. *Current Otorhinolaryngology Reports*. 2014; 2:273-284.

77. Lungren MP, Patel MN, Racadio JM, Johnson ND. **Ultrasound-guided interventions in children**. *Eur J Radiol*. 2014; 83:1582-91.

78. Mandell GA, Biyyam DR, Jorgensen S, Towbin AJ, Towbin RB. **Total Aganglionosis Associated with Ileal Atresia and Malrotation**. *Applied Radiology*. 2015; .

79. Mazhar K, Patel MN, R.G. E. **Case Study 4-2. Venous Malformation of the Scalp**. In: GT Richter, JY Suen, eds. *Head and Neck Vascular Anomalies: A Practice Case-Based Approach*. San Diego, CA: Plural Publishing; 2015.

80. Merrow AC. **Case 2: a 10-year-old girl with hip pain**. *Pediatr Radiol*. 2015; 45:640-5.

81. Merrow AC. **Case 1: a newborn with bilious emesis**. *Pediatr Radiol*. 2014; 44:1462-9.

82. Merrow AC, Gupta A, Adams DM. **Additional imaging features of intramuscular capillary-type hemangioma: the importance of ultrasound**. *Pediatr Radiol*. 2014; 44:1472-4.

83. Merrow AC, Reiter MP, Zbojniewicz AM, Laor T. **Avulsion fractures of the pediatric knee**. *Pediatr Radiol*. 2014; 44:1436-45; quiz 1433-6.

84. Nayak KS, Fleck RJ. **Seeing sleep: dynamic imaging of upper airway collapse and collapsibility in children**. *IEEE Pulse*. 2014; 5:40-4.

85. Oestreich AE. **The metaphyseal collar is also present until later childhood and at birth**. *Pediatr Radiol*. 2014; 44:1046-7.

86. Oestreich AE. **RSNA centennial article: ALARA 1912: "As low a dose as possible" a century ago**. *Radiographics*. 2014; 34:1457-60.

87. Phithakwatchara N, Coleman A, Peiro JL, Lee AE, Keswani SG, Kline-Fath B, Lim FY, Shaaban AF. **Expanded intrathoracic space in fetal cases of isolated congenital diaphragmatic hernia contributes to disparity between percent predicted lung volume and observed to expected total lung volume**. *Prenat Diagn*. 2015; 35:154-9.

88. Powers SW, Stark LJ, Chamberlin LA, Filigno SS, Sullivan SM, Lemanek KL, Butcher JL, Driscoll KA, Daines CL, Brody AS, Schindler T, Konstan MW, McCoy KS, Nasr SZ, Castile RG, Acton JD, Wooldridge JL, Ksenich RA, Szczesniak RD, Rausch JR, Stallings VA, Zemel BS, Clancy JP. **Behavioral and nutritional treatment for preschool-aged children with cystic fibrosis: a randomized clinical trial**. *JAMA Pediatr*. 2015; 169:e150636.

89. Racadio J, Strauss K, Abruzzo T, Patel M, Kukreja K, Johnson N, den Hartog M, Hoornaert B, Nachabe R. **Significant dose reduction for pediatric digital subtraction angiography without impairing image quality: preclinical study in a piglet model**. *AJR Am J Roentgenol*. 2014; 203:904-8.

90. Radhakrishnan R, Calvo-Garcia MA, Lim FY, Elluru RG, Koch BL. **Congenital salivary gland anlage tumor - in utero and postnatal imaging**. *Pediatr Radiol*. 2015; 45:453-6.

91. Rahme R, Grande A, Jimenez L, Abruzzo TA, Ringer AJ. **Onyx HD-500 embolization of intracranial aneurysms: modified technique using continuous balloon inflation under conscious sedation**. *J Clin Neurosci*. 2014; 21:1383-7.

92. Rahme R, Grande A, Jimenez L, Abruzzo TA, Ringer AJ. **Predicting parent vessel patency and treatment durability: a proposed grading scheme for the immediate angiographic results following Onyx HD-500 embolization of intracranial aneurysms**. *J Neurointerv Surg*. 2014; 6:754-60.

93. Rahme R, Yeatts SD, Abruzzo TA, Jimenez L, Fan L, Tomsick TA, Ringer AJ, Furlan AJ, Broderick JP, Khatri P. **Early reperfusion and clinical outcomes in patients with M2 occlusion: pooled analysis of the PROACT II, IMS, and IMS II studies**. *J Neurosurg*. 2014; 121:1354-8.

94. Rahme R, Yeatts SD, Abruzzo TA, Jimenez L, Fan L, Tomsick TA, Ringer AJ, Furlan AJ, Broderick JP, Khatri P. **Response**. *J Neurosurg*. 2014; 121:1352-3.

95. Rajabi-Jagahrgh E, Roy-Chaudhury P, Wang Y, Al-Rjoub M, Campos-Naciff B, Choe A, Dumoulin C, Banerjee RK. **New techniques for determining the longitudinal effects of local hemodynamics on the intima-media thickness in arteriovenous fistulae in an animal model**. *Semin Dial*. 2014; 27:424-35.

96. Rajagopal A, Byars A, Schapiro M, Lee GR, Holland SK. **Success rates for functional MR imaging in children**. *AJNR Am J Neuroradiol*. 2014; 35:2319-25.

97. Rattan MS, Brody AS. **Imaging for the Pediatric Pulmonogologist**. In: SD Davis, E Eber, AC Koumbourlis, eds. *Diagnostic Tests in Pediatric Pulmonology*. New York: Springer Science + Business Media; 2015:257-284.

98. Redle E, Vannest J, Maloney T, Tsevat RK, Eikenberry S, Lewis B, Shriberg LD, Tkach J, Holland SK. **Functional MRI evidence for fine motor praxis dysfunction in children with persistent speech disorders**. *Brain Res*. 2015; 1597:47-56.

99. Robinson KA, Jorgensen S, Towbin AJ, Towbin RB. **Traumatic cervical spine distraction injury**. *Applied Radiology*. 2015; .

100. Robinson KE, Wolfe KR, Yeates KO, Mahone EM, Cecil KM, Ris MD. **Predictors of adaptive functioning and psychosocial adjustment in children with pediatric brain tumor: a report from the Brain Radiation Investigative Study Consortium**. *Pediatr Blood Cancer*. 2015; 62:509-16.

101. Ryan ME, Palasis S, Saigal G, Singer AD, Karmazyn B, Dempsey ME, Dillman JR, Dory CE, Garber M, Hayes LL, Iyer RS, Mazzola CA, Raske ME, Rice HE, Rigsby CK, Sierzenski PR, Strouse PJ, Westra SJ, Wootton-Gorges SL, Coley BD. **ACR Appropriateness Criteria head trauma--child**. *J Am Coll Radiol*. 2014; 11:939-47.

102. Salloum R, Garrison A, von Allmen D, Sheridan R, Towbin AJ, Adams D, Weiss B. **Relapsed perinatal neuroblastoma after expectant observation**. *Pediatr Blood Cancer*. 2015; 62:160-2.

103. Sanchez-Martin FJ, Lindquist DM, Landero-Figueroa J, Zhang X, Chen J, Cecil KM, Medvedovic M, Puga A. **Sex- and tissue-specific methylome changes in brains of mice perinatally exposed to lead**. *Neurotoxicology*. 2015; 46:92-100.

104. Sanders DB, Li Z, Brody AS. **Chest computed tomography predicts the frequency of pulmonary exacerbations in children with cystic fibrosis**. *Ann Am Thorac Soc*. 2015; 12:64-9.

105. Sanders-Taylor C, Kurbanov A, Cebula H, Leach JL, Zuccarello M, Keller JT. **The carotid siphon: a historic radiographic sign, not an anatomic classification**. *World Neurosurg*. 2014; 82:423-7.

106. Schmithorst VJ, Vannest J, Lee G, Hernandez-Garcia L, Plante E, Rajagopal A, Holland SK, Consortium CA. **Evidence that neurovascular coupling underlying the BOLD effect increases with age during childhood**. *Hum Brain Mapp*. 2015; 36:1-15.

107. Seagull FJ, Bailey JE, Trout A, Cohan RH, Lypson ML. **Residents' ability to interpret radiology images: development and improvement of an assessment tool**. *Acad Radiol*. 2014; 21:909-15.

108. Serai SD, Yin M, Wang H, Ehman RL, Podberesky DJ. **Cross-vendor validation of liver magnetic resonance elastography**. *Abdom Imaging*. 2015; 40:789-94.

109. Serrone JC, Gozal YM, Grossman AW, Andaluz N, Abruzzo T, Zuccarello M, Ringer A. **Vertebrobasilar fusiform aneurysms**. *Neurosurg Clin N Am*. 2014; 25:471-84.

110. Shaughnessy EE, Towbin A, Prosser J. **Neonate with choking**. *JAMA Pediatr*. 2015; 169:281-2.

111. Simon SL, Field J, Miller LE, DiFrancesco M, Beebe DW. **Sweet/dessert foods are more appealing to adolescents after sleep restriction**. *PLoS One*. 2015; 10:e0115434.

112. Sroka MC, Vannest J, Maloney TC, Horowitz-Kraus T, Byars AW, Holland SK, Consortium CA. **Relationship between receptive vocabulary and the neural substrates for story processing in preschoolers**. *Brain Imaging Behav*. 2015; 9:43-55.

113. Strauss KJ. **Developing patient-specific dose protocols for a CT scanner and exam using diagnostic reference levels**. *Pediatr Radiol*. 2014; 44 Suppl 3:479-88.

114. Strauss KJ. **Dose indices: everybody wants a number**. *Pediatr Radiol*. 2014; 44 Suppl 3:450-9.

115. Strauss KJ, Racadio JM, Johnson N, Patel M, Nachabe RA. **Estimates of diagnostic reference levels for pediatric peripheral and abdominal fluoroscopically guided procedures**. *AJR Am J Roentgenol*. 2015; 204:W713-9.

116. Szaflarski JP, Allendorfer JB, Byars AW, Vannest J, Dietz A, Hernando KA, Holland SK. **Age at stroke determines post-stroke language lateralization**. *Restor Neurol Neurosci*. 2014; 32:733-42.

117. Tandon A, Jefferies JL, Villa CR, Hor KN, Wong BL, Ware SM, Gao Z, Towbin JA, Mazur W, Fleck RJ, Sticka JJ, Benson DW, Taylor MD. **Dystrophin genotype-cardiac phenotype correlations in Duchenne and Becker muscular dystrophies using cardiac magnetic resonance imaging**. *Am J Cardiol*. 2015; 115:967-71.

118. Tandon A, Villa CR, Hor KN, Jefferies JL, Gao Z, Towbin JA, Wong BL, Mazur W, Fleck RJ, Sticka JJ, Benson DW, Taylor MD. **Myocardial fibrosis burden predicts left ventricular ejection fraction and is associated with age and steroid treatment duration in duchenne muscular dystrophy**. *J Am Heart Assoc*. 2015; 4.

119. Tkach JA, Li Y, Pratt RG, Baroch KA, Loew W, Daniels BR, Giaquinto RO, Merhar SL, Kline-Fath BM, Dumoulin CL. **Characterization of acoustic noise in a neonatal intensive care unit MRI system**. *Pediatr Radiol*. 2014; 44:1011-9.

120. Tocchio S, Kline-Fath B, Kanal E, Schmithorst VJ, Panigrahy A. **MRI evaluation and safety in the developing brain**. *Semin Perinatol*. 2015; 39:73-104.

121. Towbin AJ. **The use of gadolinium-based contrast agents in children**. *Applied Radiology*. 2015; .

122. Towbin AJ, Rowlan J, Parham DM. **Gastrointestinal, Pnacreatic and Hepatic Malignancies in Children**. In: DM Parham, JD Khoury, MB McCarville, eds. *Pediatric Malignancies : Pathology and Imaging*. New York: Springer; 2015:245-270.

123. Towbin AJ, Trout AT, Roebuck DJ. **Advances in oncologic imaging**. *Eur J Pediatr Surg*. 2014; 24:474-81.

124. Trout AT, Sharp SE, Anton CG, Gelfand MJ, Mehlman CT. **Spondylolysis and Beyond: Value of SPECT/CT in Evaluation of Low Back Pain in Children and Young Adults**. *Radiographics*. 2015; 35:819-34.

125. Trout AT, Towbin AJ. **Seasonal foreign bodies: the dangers of winter holiday ornamentation**. *Pediatr Radiol*. 2014; 44:1610-6.

126. Vannest J, Rajagopal A, Cicchino ND, Franks-Henry J, Simpson SM, Lee G, Altaye M, Sroka C, Holland SK, Consortium CA. **Factors determining success of awake and asleep magnetic resonance imaging scans in nonsedated children**. *Neuropediatrics*. 2014; 45:370-7.

127. Versace A, Acuff H, Bertocci MA, Bebko G, Almeida JR, Perlman SB, Leemans A, Schirda C, Aslam H, Dwojak A, Bonar L, Travis M, Gill MK, Demeter C, Diwadkar VA, Sunshine JL, Holland SK, Kowatch RA, Birmaher B, Axelson D, Horwitz SM, Frazier TW, Arnold LE, Fristad MA, Youngstrom EA, Findling RL, Phillips ML. **White matter structure in youth with behavioral and emotional dysregulation disorders: a probabilistic tractographic study**. *JAMA Psychiatry*. 2015; 72:367-76.

128. Wallihan DB, Podberesky DJ, Marino BS, Sticka JS, Serai S. **Relationship of MR elastography determined liver stiffness with cardiac function after Fontan palliation**. *J Magn Reson Imaging*. 2014; 40:1328-35.

129. Weaver KN, Johnson J, Kline-Fath B, Zhang X, Lim FY, Tinkle B, Saal HM, Hopkin RJ. **Predictive value of fetal lung volume in prenatally diagnosed skeletal dysplasia**. *Prenat Diagn*. 2014; 34:1326-31.

130. Weaver KN, Watt KE, Hufnagel RB, Navajas Acedo J, Linscott LL, Sund KL, Bender PL, Konig R, Lourenco CM, Hehr U, Hopkin RJ, Lohmann DR, Trainor PA, Wieczorek D, Saal HM. **Acrofacial Dysostosis, Cincinnati Type, a Mandibulofacial Dysostosis Syndrome with Limb Anomalies, Is Caused by POLR1A Dysfunction**. *Am J Hum Genet*. 2015; 96:765-74.

131. Welles C, Jorgensen SA, Towbin AJ, Towbin RB. **Coronary Artery Aneurysms**. *Applied Radiology*. 2015; .

132. Westra SJ, Brody AS, Mahani MG, Guillerman RP, Hegde SV, Iyer RS, Lee EY, Newman B, Podberesky DJ, Thacker PG. **The incidental pulmonary nodule in a child. Part 1: recommendations from the SPR Thoracic Imaging Committee regarding characterization, significance and follow-up**. *Pediatr Radiol*. 2015; 45:628-33.

133. White SC, Scarfe WC, Schulze RK, Lurie AG, Douglass JM, Farman AG, Law CS, Levin MD, Sauer RA, Valachovic RW, Zeller GG, Goske MJ. **The Image Gently in Dentistry campaign: promotion of responsible use of maxillofacial radiology in dentistry for children**. *Oral Surg Oral Med Oral Pathol Oral Radiol*. 2014; 118:257-61.

134. Wiland EL, South AP, Kraus SJ, Meinzen-Derr J. **Utility of gastrointestinal fluoroscopic studies in detecting stricture after neonatal necrotizing enterocolitis**. *J Pediatr Gastroenterol Nutr*. 2014; 59:789-94.

135. Wilke M, Rose DF, Holland SK, Leach JL. **Multidimensional morphometric 3D MRI analyses for detecting brain abnormalities in children: impact of control population**. *Hum Brain Mapp*. 2014; 35:3199-215.

136. Winter PM, Pearce J, Chu Z, McPherson CM, Takigiku R, Lee JH, Qi X. **Imaging of brain tumors with paramagnetic vesicles targeted to phosphatidylserine**. *J Magn Reson Imaging*. 2015; 41:1079-87.

137. Wright KL, Lee GR, Ehses P, Griswold MA, Gulani V, Seiberlich N. **Three-dimensional through-time radial GRAPPA for renal MR angiography**. *J Magn Reson Imaging*. 2014; 40:864-74.

138. Yang D, Sun YY, Bhaumik SK, Li Y, Baumann JM, Lin X, Zhang Y, Lin SH, Dunn RS, Liu CY, Shie FS, Lee YH, Wills-Karp M, Chougnet CA, Kallapur SG, Lewkowich IP, Lindquist DM, Murali-Krishna K, Kuan CY. **Blocking lymphocyte trafficking with FTY720 prevents inflammation-sensitized hypoxic-ischemic brain injury in newborns**. *J Neurosci*.

2014; 34:16467-81.

139. Yousef S, Solomon GM, Brody A, Rowe SM, Colin AA. **Improved clinical and radiographic outcomes after treatment with ivacaftor in a young adult with cystic fibrosis with the P67L CFTR mutation**. *Chest*. 2015; 147:e79-82.

140. Zbojniewicz AM. **US for diagnosis of musculoskeletal conditions in the young athlete: emphasis on dynamic assessment**. *Radiographics*. 2014; 34:1145-62.

Faculty, Staff, and Trainees

Faculty Members

Brian D. Coley, MD, Professor

Leadership Director and Radiologist-in-Chief; Endowed Chair, The Frederic N. Silverman Chair for Pediatric Radiology

Research Interests Ultrasound, imaging care delivery

Bernadette L. Koch, M.D., Professor

Leadership Associate Chief, Academic Affairs

Research Interests Imaging the pediatric head and neck

Blaise V. Jones, MD, Professor

Leadership Associate Chief, Clinical Operations; Division Chief, Neuroradiology; Division Co-Chief, MRI; Director, MRI Safety

Research Interests Pediatric neuroradiology, neuro-oncology and cerebrovascular diseases

Todd A. Abruzzo, MD, Associate Professor

Leadership Chief, Pediatric Interventional Neuroradiology

Research Interests Cerebrovascular disease, childhood stroke, aneurysms, intra-arterial chemotherapies, vascular malformations, neurovascular interventions

Christopher G. Anton, MD, Assistant Professor

Leadership Associate Director, Radiology Residency Program; Division Chif, Radiography

Research Interests Musculoskeletal diseases

Alison Aquado, MD, Assistant Professor

Research Interests Pediatric Transarterial Radioembolization for primary and secondary hepatic malignancies using yttrium-90 HIFU

Micahel Aquino, MD, Assistant Professor

Research Interests Emergency and trauma imaging, ultrasound, medical education

Diane S. Babcock, MD, Professor Emerita

William S Ball, MD, Professor

Research Interests Pediatric Neuroradiology

Alan S. Brody, MD, Professor

Leadership Associate Director for Clinical Research in Radiology; Division Chief, Thoracic Imaging

Research Interests Imaging of the chest in cystic fibrosis and in childhood diffuse lung disease. Computer analysis of chest CT and MR in pediatric lung disease. Study design for clinical research using imaging biomarkers.

Maria A. Calvo-Garcia, MD, Associate Professor

Research Interests Fetal development and malformations including cloaca and other ano-rectal malformations, obstructive uropathy, skeletal dysplasias, vascular birthmarks, etc.

Marguerite M. Care, MD, Assistant Professor

Research Interests Traumatic brain injury, child abuse, CT neuroimaging

Kim M. Cecil, PhD, Professor

Leadership Chair of the Imaging Research Center's Scientific Advisory Committee

Research Interests Application of MR spectroscopy and imaging in several populations by characterizing the features of inborn errors in metabolism, attention-deficit hyperactivity disorder (ADHD), traumatic brain injury, and evaluating the effects of environmental neurotoxicants.

Eric J. Crotty, MD, Assistant Professor

Leadership Director, Pediatric Radiology Fellowship Program

Research Interests Cardiothoracic radiology and resident education

Mark DiFrancesco, PhD, Assistant Professor

Leadership 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

Leadership Director, Imaging Research Center

Research Interests Physics and engineering of Magnetic Resonance, MRI of neonates, MR-guided vascular interventions, and MR-guided Focused Ultrasound Therapy

Kathleen H. Emery, MD, Professor

Leadership Division Co-Chief. Musculoskeletal Imaging

Research Interests Musculoskeletal imaging and sports medicine

Robert J. Fleck, MD, Assistant Professor

Research Interests CT and MR of the cardiopulmonary system.

Michael J. Gelfand, MD, Professor

Leadership 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 MR coil engineering

Marilyn J. Goske, MD, Professor

Leadership Chair, Educational Council

Research Interests Radiation protection for children, communication, education for radiologists, technologists and fellows.

Kathy J. Helton-Skally, MD, Assistant Professor

Scott Holland, PhD, Professor

Leadership Director, Pediatric Neuroimaging Research Consortium; Director, Communication Sciences Research Center

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

Tzipi Horowitz-Kraus, z, Professor

Leadership Program Director, Reading and Literacy Discovery Center

Research Interests Neuroimaging: written language; oral language development

Neil D. Johnson, MD, Professor

Leadership Endowed Chair, The Neil D. Johnson Chair for Radiology Informatics; Medical Director, Vascular Access

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

Hee Kyung Kim, MD, Assistant Professor

Research Interests Advanced MR techniques in pediatric MR studies, neuromuscular disease, and cartilage image

Beth M. Kline-Fath, MD, Associate Professor

Leadership Division Chief, Fetal and Neonatal Imaging

Research Interests Fetal MRI, fetal ultrasound and neonatal neuroimaging

Steven J. Kraus, MD, Associate Professor

Leadership Division Chief, Fluoroscopy

Research Interests Gastrointestinal malformations

Tal Laor, MD, Professor

Leadership 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

Leadership Director, Pediatric Neuroradiology Fellowship Program

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

Greg Lee, PhD, Assistant Professor

Research Interests High-speed MR imaging

Yu Li, PhD, Assistant Professor

Research Interests Technological development and clinical applications of high speed MR imaging and spectroscopy including RF coil array technology for clinical MRI

Diana Lindquist, PhD, Associate Professor

Leadership Director of the InVivo MicroImaging Laboratory

Research Interests Metabolic effects of drugs used to treat psychiatric illness

Luke Linscott, MD, Assistant Professor

Leadership Chair, MRI Division Quality Improvement Committee

Research Interests Pediatric vascular brain injury and pediatric craniocervical junction

Carl (Arnold) Merrow, Jr, M.D., Assistant Professor

Leadership Endowed Chair, The Corning Benton Chair for Radiology Education

Research Interests Pediatric musculoskeletal and fetal imaging with particular attention to vascular anomalies

Usha Nagaraj, MD, Assistant Professor

Research Interests Pediatric neuroimaging, fetal MRI

Michael P. Nasser, MD, Assistant Professor

Alan E. Oestreich, MD, Professor Emeritus

Research Interests Musculoskeletal plain imaging; bone dysplasias; metabolic bone disease; umbilical vein catheterization; postgastric magnetopathy; sequential perception

Sara M. O'Hara, MD, Professor

Leadership Division Chief, Ultrasound

Research Interests Cutting edge ultrasound techniques and equipment, genitourinary imaging, and newborn imaging

Manish N. Patel, MD, Associate Professor

Leadership Medical Director, Radiology Liberty; Director of Daily Operations, IR

Research Interests Diagnosis and treatment of vascular malformation, pediatric PICC placement, and pre-operative evaluation of patient with anorectal malformation

John M. Racadio, MD, Professor

Leadership Division Chief, Interventional Radiology; Director IR Research Lab

Research Interests 3D image fusion and intervention, radiation safety, and viral oncolytic therapy

Mantosh Rattan, MD, Assistant Professor

Research Interests Thoracic imaging, neonatal abdominal MRI

Susan E. Sharp, MD, Assistant Professor

Research Interests Pediatric nuclear medicine, focusing on SPECT/CT and PET/CT.

Suraj Serai, PhD, Assistant Professor

Research Interests MR physics; t2 mapping; spectroscopy; diffusion; fMRI; optimization of MR imaging protocols for enhanced image quality and better diagnosis

Keith Strauss, , Assistant Professor

Leadership Clinical Imaging Physicist

Research Interests Radiation dose reduction, image optimization

Jean Tkach, PhD, Associate Professor

Research Interests Development, implementation and optimization of neonatal MRI acquisition techniques

Alexander J. Towbin, MD, Associate Professor

Leadership Director, Radiology Informatics

Research Interests Radiology informatics; cancer imaging and abdominal imaging

Andrew Trout, MD, Assistant Professor

Leadership Interim Division Chief, Thoraco-abdominal Imaging

Research Interests Nuclear medicine; advanced body CT and MR imaging

Daniel B. Wallihan, MD, Assistant Professor

Research Interests Cardiovascular imaging and education

Weihong Yuan, PhD, Associate Professor

Research Interests Diffusion tensor imaging in clinical and experimental hydrocephalus. Advanced neuroimaging techniques in pediatric patients with traumatic brain injury, sports concussion, TSC, epilepsy and other neurological disorders

Andrew M. Zbojniewicz, MD, Assistant Professor

Research Interests Musculoskeletal imaging, US-guided therapy

Joint Appointment Faculty Members

William S. Ball, MD, Associate Professor (Neuroimaging Research Consortium)

Research Interests Pediatric Neuroradiology

Scott Holland, PhD, Professor (Neuroimaging Research Consortium/Reading and Literacy Discovery Center)

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

communication skills in the developing brain

Tzipi Horowitz-Kraus, PhD, Assistant Professor (Neuroimaging Research Consortium/Communication Science)
Research Interests Neuroimaging: written language; oral language development

Darren Kadis, PhD, Assistant Professor (Neuroimaging Research Consortium/Neurology)

Jeffrey Tenney, PhD, Assistant Professor (Neuroimaging Research Consortium/Neurology and Neuroscience)
Research Interests Oral and written language typical and atypical development, Brain plasticity following intervention

Jennifer Vannest, PhD, Associate Professor (Neuroimaging Research Consortium/Neurology)
Research Interests Functional neuroimaging of language and cognitive development, effects of neurological and developmental disorders on language and cognitive function

Jason C. Woods, PhD, Professor (Neuroimaging Research Consortium/Pulmonary Medicine)
Research Interests Hyperpolarized 3He and 129Xe; pulmonary MRI; UTE MRI; translational studies related to asthma, CF, rare-lung diseases, COPD, and chronic lung disease of prematurity; image-guided pulmonary interventions, neonatal imaging and lung development

Jing Xiang, MD, PhD, Associate Professor (Neuroimaging Research Consortium/Neurology)
Research Interests Magnetoencephalography (MEG), MEG studies of migraine, epilepsy and autism

Trainees

- **Aaron Betts, MD**, PL-7, Brooke Army Medical Center
- **Kelly Bradley, MD**, PL-6, SUNY Upstate Medical University
- **Jeffrey P. Clarke, MD**, PL-6, Allegheny General Hospital
- **Sinisa Haberle, MD, MPH**, PL-6, Duke University Medical Center
- **Grace S. Mitchell, MD, MBA**, PL-6, Baystate Medical Center
- **Matthew R. Plunk, MD**, PL-6, University of Washington
- **Rupa Radhakrishnan, MD**, PL-7, University of Cincinnati College of Medicine
- **Timothy R. Singewald, MD**, PL-6, University of Cincinnati Medical Center
- **Judy H. Squires, MD**, PL-6, University of Cincinnati Medical Center
- **Jill M. Stein, MD**, PL-6, University of Utah School of Medicine
- **Jonathan R. Woods, MD**, PL-6, San Antonio Uniformed Services Health Education Consortium

Grants, Contracts, and Industry Agreements

Grant and Contract Awards **Annual Direct**

Abruzzo, T

Ultrasound-assisted Thrombolysis for Stroke Therapy

National Institutes of Health(University of Cincinnati)

R01 NS047603	8/15/2014-7/31/2019	$27,866

Holland, S

Maitenance, Analysis and Dissemination of CMIND Database

National Institutes of Health

HHSN275201400002C	9/26/2014-9/25/2015	$153,205

Kim, H

Quantitative MR imaging of Cartilage in Juvenile Idiopathic Arthritis (JIA)

Society of Pediatric Radiology

	9/1/2014-8/31/2015	$50,000

Lee, G

Comprehensive Quantitative Ultrafast 3D Liver MRI

National Institutes of Health(Case Western University)

R01 DK098503	8/1/2013-7/31/2018	$16,100

Li, Y

Novel RF Coils and k-t Space Imaging for Neonatal Chest MRI with NICUs

National Institutes of Health

R21 HD071540	8/1/2013-7/31/2015	$145,800

Lindquist, D

The Effect of Lithium on Intracellular Sodium in Brain in vivo

National Institutes of Health(University of Cincinnati)

R21 MH094837	9/1/2013-8/31/2015	$89,331

	Current Year Direct	**$482,302**

Industry Contracts

Brody, A

PTC Therapeutics, Inc	$36,784

Dumoulin, C

GE Healthcare	$20,390

Fleck, R

Bayer HealthCare Pharmaceuticals, Inc	$17,556

Podberesky, D

Siemens Medical Solutions USA, Inc	$4,454

Current Year Direct Receipts	**$79,184**
Total	**$561,486**

Surgical Anesthesia in Young Children Linked to Effects on IQ, Brain Structure

Andreas Loepke, MD, PhD

Scott Holland, PhD

RESEARCH AND TRAINING DETAILS

Faculty	46
Joint Appointment Faculty	8
Research Students	8
Support Personnel	52
Direct Annual Grant Support	$482,302
Direct Annual Industry Support	$79,184
Peer Reviewed Publications	140

Backeljauw B, Holland SK, Altaye M, Loepke AW. Cognition and Brain Structure Following Early Childhood Surgery With Anesthesia. *Pediatrics*. 2015;136(1):e1-e12.

PUBLISHED ONLINE JUNE 8, 2015
Pediatrics

Scientific understanding of anesthesia's impact on young children took a significant leap forward in June, when a multi-divisional study revealed correlations to slightly lower brain function and IQ.

Researchers were quick to caution that direct causation remains unresolved, and additional studies were needed to determine anesthesia's precise molecular effects on several functions, including language comprehension, in children who underwent surgery before age 4.

The study, published online June 8, 2015, in *Pediatrics*, garnered wide-ranging media coverage, including pieces in *Scientific American*, *U.S. News and World Report* and *Anesthesiology News* and coverage on NPR, CTV and Slate.com. Andreas Loepke, MD, PhD, of the Department of Anesthesia, was the lead author. Scott Holland, PhD, Director of the Pediatric Neuroimaging Research Consortium, led the Division of Radiology's contributions.

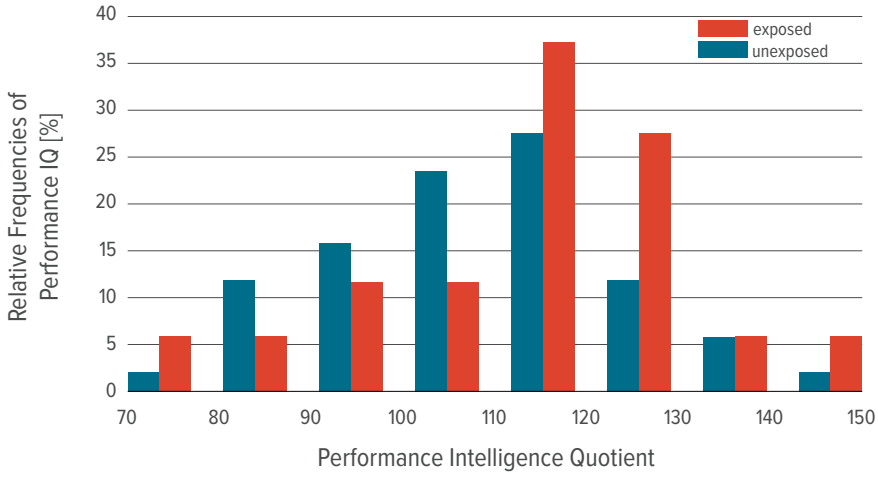
This new knowledge could make it possible to develop mitigating strategies for what scientists describe as a potential dilemma for child health.

"We have to better understand to what extent anesthetics and other factors contribute to learning abnormalities in children before making drastic changes to our current practice, which by all measures has become very safe," Loepke says.

In the study, researchers compared test scores of 53 healthy participants in a language development study (ages 5 to 18 years with no history of surgery) with those of 53 children in the same age range who had undergone surgery before age 4.

The authors emphasized that average test scores for all 106 children were within population norms. Still, compared with children who had not undergone surgery, children exposed to anesthesia scored significantly lower in key areas that warrant additional examination.

Loepke, Holland and Mekbib Altaye, PhD, Division of Biostatistics and Epidemiology, have submitted an application to the National Institutes of Health seeking funding for a follow up study to investigate more deeply the influence of early anesthesia exposure on brain development.



Substantial concerns have recently been raised regarding the long-term effects of anesthesia and surgery on the developing brain. Brain functional and structural comparisons, conducted by using T1-weighted MRI scans, played a crucial role in a widely-discussed study reporting that exposure to surgical anesthesia can result in diminished language comprehension and IQ. Exposure did not lead to gross elimination of gray matter in regions previously identified as vulnerable in animals. However, decreased performance IQ was associated with diminished gray matter densities in the occipital cortex and cerebellum.