

# Research in Patient Services

## Division Details

### RESEARCH AND TRAINING DETAILS

Faculty	8
Joint Appointment Faculty	9
Research Fellows and Post Docs	5
Research Graduate Students	1
Total Annual Grant Award Dollars	\$2,142,617



Row 1: A Bailes, B Giambra, K Harpster, L Ramsey

Row 2: T Phoenix, D Moore, S Staveski, M Paterno, S Vinks

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## Division Highlights

### Communication Sciences Research Center

The Communication Sciences Research Center (CSRC) incorporates research from the Divisions of [Audiology](#), [Speech Language Pathology](#), and the Reading and Literacy Discovery Center (RLDC). [Dr. Lisa Hunter, PhD, FAAA](#), is collaborating with Drs. [Sander Vinks, PharmD, PhD, FCP](#); [Laura Ramsey, PhD](#); [Min Dong, PhD](#), in the [Division of Clinical Pharmacology](#); and Drs. [John Clancy, MD](#), and [Gary Lewis McPhail, MD](#), both from the [Division of Pulmonary Medicine](#), to study prevention of permanent, progressive hearing loss in children and teens with cystic fibrosis (CF).

Recent adult studies (*J Cystic Fibrosis*, 2017; *Ear and Hearing*, 2017) from a national multisite R01 by Drs. Keefe, Feeney, and Hunter showed that hearing loss results from drug toxicity due to antibiotic treatment for serious lung infections. The team just received a Place Award to study methods to predict higher drug exposures that may cause toxicity, and to personalize a safer treatment approach by combining genetic and pharmacokinetic data. Additional studies of new audiologic tests for earlier detection of hearing loss submitted for funding to the National Institutes of Health (NIH). NIH funding to Drs. Moore and Hunter (R01DC014078), uses sensitive techniques to measure subtle ('subclinical') aspects of ear and brain function in 6-12 year old children with listening difficulties.

Recently, we found that many of these children have 'hidden hearing loss', very high frequency hearing loss and/or broadly insensitive inner ear function associated with impaired speech hearing in noise. New NIH funding (R21DC016241) to Drs. Moore and [Swanepoel \(University of Pretoria, Republic of South Africa\)](#) will examine how a smartphone app that measures speech hearing in noise utilized to identify candidature for hearing aid-like amplification delivered from the same smart phone, thus potentially providing hearing habilitation to millions of currently under-served people.

The Reading and Literacy Discovery Center (RLDC) frames reading as a pediatric health issue, applying a variety of innovative approaches from MRI to children's books to explore the neurobiological basis of reading acquisition and difficulties, improve early screening and pediatric health literacy, and guide interventions. This year, [Dr. Tzipi Horowitz-Kraus, PhD](#), and colleagues, published a summary of

emergent literacy skills and milestones from birth to adolescence (*Acta Paediatrica*). [Dr. John Hutton, MS, MD](#), completed pilot data collection (>700 children) to refine screening instruments for primary care and research, and for a clinic-based screening tool in children's book format for 3-4 year olds (The Reading House), supported by a [Procter Scholar Award](#). Recent RLDC presentations and publications highlighted critical factors influencing reading ability and underlying brain networks: digital screen time, traditional versus animated book format, and family history of reading difficulties (Horowitz-Kraus, *Annals Dyslexia*, 2017).

Drs. Horowitz-Kraus and [Scott Holland, PhD](#), recently launched a [NICHD](#) RO1-funded study to validate the role of cognitive executive functions in reading development. *Journal of Childhood & Developmental Disorders* will soon publish Dr. Coonce's study evaluating the effectiveness of the [Orton-Gillingham program](#) in low-income children. Research found dialogic reading, promoting dialogue between children and grownup readers to influence brain function and connectivity supporting emergent literacy and learning (Hutton et al., *PLoS One*, 2017), as well as the child's emerging reading brain network (Horowitz-Kraus et al., *Org. Human Brain Mapping*, 2017). Dr. Schumacher is leading a new study using iPads for literacy training with low-income, preschool children.

Szczesniak RD, Li D, Su W, Brokamp C, Pestian J, Seid M, Clancy JP. [Phenotypes of Rapid Cystic Fibrosis Lung Disease Progression during Adolescence and Young Adulthood](#). *Am J Respir Crit Care Med*. 2017 Aug 15;196(4):471-478.

## Nursing Research

The goals of the Nursing Research program are to fuel interdisciplinary discoveries focused on pressing patient, clinician, and system needs; improve health and healthcare for patients, families, and workers; and build the critical pipeline of pediatric nurse scientists needed for the future. The division is pursuing several major lines of research. New National Institutes of Health ([NIH](#)) funding (1R21HD084863) to [Dr. Heather Tubbs Cooley, PhD, RN](#), supports the identification of systems factors that impede nurses' adherence to safety guidelines in the neonatal intensive care unit, with the goal of developing interventions for evaluation in future work. The study is a unique collaboration between nursing and industrial systems engineering, and has outstanding potential to reduce patient harm by improving the work of nurses.

With funding support from the [Children's Heart Association of Cincinnati](#) and the Patient Services Collaborative Grant, [Dr. Sandra Staveski, PhD, RN, APRN, CPNP-AC](#), is leading research to improve post-operative outcomes after congenital heart surgery. The Home Care for Heart Health study tests the effects of a structured interprofessional clinician-parent home care education intervention developed in partnership with parents, [Heart Institute](#) clinicians, and the [Live Well Collaborative](#).

[Dr. Nancy Daraiseh's](#) recently completed research establishes for the first time, the feasibility and sustainability of active injury surveillance of healthcare providers including the collection of near-misses and psychological injuries. She also published research that standardizes the selection of personal protective equipment for care providers working with aggressive patients in neuropsychiatric units.

[Dr. Barbara Giambra, PhD, RN, CPNP](#), a Nursing Research post-doctoral research fellow from 2015 to 2017, will join the division as faculty in fiscal year 2018. Dr. Giambra's research focuses on the communication behaviors of providers and families of children with chronic conditions, and the impact on the family's ability to manage the child's care.

## Occupational Therapy and Physical Therapy Research

The [Division of Occupational Therapy and Physical Therapy](#) continues to pursue lines of research with the vision to be the leader at improving child health through the systematic generation, adoption and rapid integration of rehabilitation knowledge in order to promote healthy behaviors, engagement in valued activity and improved quality of life. In FY 17, the focus was primarily on four strategic goals: 1) Improve outcome, cost and value for patients with neuromuscular and developmental disorders seeking rehabilitation services; 2) Early detection and intervention for infants at risk for cerebral palsy; 3) Become an international leader in the rehabilitation management of patients with mild traumatic brain injury; and 4) Reduce anterior cruciate ligament reinjury rates after discharge from physical therapy. Central to these goals, the division published over 23 peer reviewed manuscripts in high impact journals such as the *American Journal of Sports Medicine*, *Journal of Orthopaedic Research*, *Pediatric Physical Therapy*, *American Journal of Occupational Therapy*, *Neuropediatrics and Physical Therapy Journal*. Division investigators successfully procured internal funding, as well as extramural funding, from the National Institutes of Health ([NIH](#)) and various foundations. In recognition of outstanding work, our clinical scientists received several prestigious honors, including the 2017 Pediatric Research in Sports Medicine ([PRiSM](#)) Achievement Award for Physical Therapy.

## Pharmacy Research

## Pharmacogenetics of Psychiatric Drug dosage and Efficacy

As part of a training grant funded by the Research in Patient Services, [Dr. Laura Ramsey, PhD](#), is studying how genetic variants in two drug metabolizing enzymes influence the response to neuropsychiatric medications in children. There are guidelines for how to appropriately dose adults taking several neuropsychiatric medications based on these genetic variants but the data are lacking in children. She aims to provide the evidence necessary to improve guidance to clinicians on how best to dose antidepressant and antipsychotic medications. This year Dr. Ramsey became a co-director of Cincinnati Children's [Genetic Pharmacology Service](#), which provides dosing recommendations based on pharmacogenetic testing. Dr. Ramsey published five articles in FY 17, spoke as an invited speaker for the [University of Florida's Precision Medicine Conference](#) and their Center for Pharmacogenomics seminar series, and selected to give an oral presentation at the Childhood Leukemia Early Adverse Reactions Conference in Denmark.

## Defining Drug Delivery Barriers in Diffuse Intrinsic Pontine Glioma

Dr. Timothy Phoenix, joint member of Research Patient Services and [James L. Winkle College of Pharmacy](#), received a trio of internal grants to begin his studies on advancing our understanding of pediatric brain tumor pathology and mechanisms of therapy resistance. A Center for Clinical and Translational Science and Training (CCTST) funded [CT2 Mentored Career Development Award](#) study will investigate differences in blood-brain barrier status and drug penetration in pediatric high-grade gliomas. High-grade gliomas are the deadliest pediatric brain tumor. Maintenance of the blood-brain barrier, especially in brainstem located tumors, impairs drug penetration and efficacy. This study will characterize vascular differences that occur in high-grade glioma subgroups, and explore new avenues of modulating blood-brain barrier function to improve drug penetration and patient outcome.

A study, funded by the UC Brain Tumor Center Molecular Therapeutics Pilot Grant, is examining mechanism of metastasis and recurrence in medulloblastoma subgroups. Brain tumor recurrence is highly linked to therapy failure in medulloblastoma, and improving our understanding of why certain tumors persist after initial treatment could reveal novel treatment options and biomarkers. With 20+ newly identified molecular subgroups of pediatric brain tumors, there is a significant need to generate new laboratory models to study subgroup specific mechanisms of disease pathogenesis, and initiate preclinical studies of newly proposed therapies with funds from a [UC Gardner Neuroscience Institute](#) Pilot Grant (Co-PI with [Dr. Smruti Patel, MD, UC College of Medicine](#)), four newly defined pediatric brain tumor subgroups researchers will model in mice. Successful mouse models for future use in drug development and preclinical studies, facilitating the development of new Phase 1 clinical trials for these rare and aggressive pediatric brain tumors.

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## Division Publications

1. Katerndahl CDS; Heltemes-Harris LM; Willette MJL; Henzler CM; Fietze S; Yang R; Schjerven H; Silverstein KAT; Ramsey LB; Hubbard G. [Antagonism of B cell enhancer networks by STAT5 drives leukemia and poor patient survival](#). *Nature Immunology*. 2017; 18:694-704.
2. Karol SE; Larsen E; Cheng C; Cao X; Yang W; Ramsey LB; Fernandez CA; McCorkle JR; Paugh SW; Autry RJ. [Genetics of ancestry-specific risk for relapse in acute lymphoblastic leukemia](#). *Leukemia*. 2017; 31:1325- 1332.
3. Russell K; Oliver SE; Lewis L; Barfield WD; Cragan J; Meaney-Delman D; Staples JE; Fischer M; Peacock G; Oduyebo T. [Update: Interim guidance for the evaluation and management of infants with possible congenital Zika virus infection - United States, August 2016](#). *Morbidity and Mortality Weekly Report Recommendations and Reports Rr*. 2016; 65:870-878.
4. Ramsey LB; Mizuno T; Vinks AA; Margolis PA. [Learning Health Systems as Facilitators of Precision Medicine](#). *Clinical Pharmacology and Therapeutics*. 2017; 101:359-367.
5. Sauers-Ford HS; Gold JM; Statile AM; Tubbs-Cooley HL; Simmons JM; Shah SS; Bell K; Pfefferman C; Moore MJ; Auger KA. [Improving Recruitment and Retention Rates in a Randomized Controlled Trial](#). *Pediatrics*. 2017; 139:e20162770.

6. Hunter LL; Meinzen-Derr J; Wiley S; Horvath CL; Kothari R; Wexelblatt S. **Influence of the WIC Program on Loss to Follow-up for Newborn Hearing Screening.** *Pediatrics*. 2016; 138:e20154301.
7. Beck AF; Solan LG; Brunswick SA; Sauers-Ford H; Simmons JM; Shah S; Gold J; Sherman SN; H2O Study Group. **Socioeconomic status influences the toll paediatric hospitalisations take on families: a qualitative study.** *BMJ Quality and Safety*. 2017; 26:304-311.
8. Brewer CC; Zalewski CK; King KA; Zobay O; Riley A; Ferguson MA; Bird JE; McCabe MM; Hood LJ; Drayna D. **Heritability of non-speech auditory processing skills.** *European Journal of Human Genetics*. 2016; 24:1137-1144.
9. Zwolski C; Schmitt LC; Thomas S; Hewett TE; Paterno MV. **The Utility of Limb Symmetry Indices in Return-to-Sport Assessment in Patients With Bilateral Anterior Cruciate Ligament Reconstruction.** *American Journal of Sports Medicine*. 2016; 44:2030-2038.
10. Garinis AC; Cross CP; Srikanth P; Carroll K; Feeney MP; Keefe DH; Hunter LL; Putterman DB; Cohen DM; Gold JA. **The cumulative effects of intravenous antibiotic treatments on hearing in patients with cystic fibrosis.** *Journal of Cystic Fibrosis*. 2017; 16:401-409.
11. Hunter LL; Keefe DH; Feeney MP; Fitzpatrick DF; Lin L. **Longitudinal development of wideband reflectance tympanometry in normal and at-risk infants.** *Hearing Research*. 2016; 340:3-14.
12. Hunter LL; Keefe DH; Feeney MP; Fitzpatrick DF. **Pressurized Wideband Acoustic Stapedial Reflex Thresholds: Normal Development and Relationships to Auditory Function in Infants.** *Journal of the Association for Research in Otolaryngology*. 2017; 18:49-63.
13. Keefe DH; Feeney MP; Hunter LL; Fitzpatrick DF. **Aural Acoustic Stapedius-Muscle Reflex Threshold Procedures to Test Human Infants and Adults.** *Journal of the Association for Research in Otolaryngology*. 2017; 18:65-88.
14. Hewett TE; Myer GD; Ford KR; Paterno MV; Quatman CE. **Mechanisms, Prediction, and Prevention of ACL Injuries: Cut Risk With Three Sharpened and Validated Tools.** *Journal of Orthopaedic Research*. 2016; 34:1843-1855.
15. Merhar SL; Gozdas E; Tkach JA; Harpster KL; Schwartz TL; Yuan W; Kline-Fath BM; Leach JL; Altaye M; Holland SK. **Functional and structural connectivity of the visual system in infants with perinatal brain injury.** *Pediatric Research*. 2016; 80:43-48.
16. Feeney MP; Keefe DH; Hunter LL; Fitzpatrick DF; Garinis AC; Putterman DB; McMillan GP. **Normative Wideband Reflectance, Equivalent Admittance at the Tympanic Membrane, and Acoustic Stapedius Reflex Threshold in Adults.** *Ear and Hearing*. 2017; 38:e142-e160.
17. Hugentobler JA; Gupta R; Slater R; Paterno MV; Riley MA; Quatman-Yates C. **Influence of Age on Postconcussive Postural Control Measures and Future Implications for Assessment.** *Clinical Journal of Sport Medicine*. 2016; 26:510-517.
18. Walsh K; Ryan J; Daraiseh N; Pai A. **Errors and Nonadherence in Pediatric Oral Chemotherapy Use.** *Oncology: international journal of cancer research and treatment*. 2016; 91:231-236.
19. Staveski S; Abrajano C; Casazza M; Bair E; Quan H; Dong E; Petty A; Felix K; Roth SJ. **SILVER-IMPREGNATED DRESSINGS FOR STERNOTOMY INCISIONS TO PREVENT SURGICAL SITE INFECTIONS IN CHILDREN.** *American journal of critical care : an official publication, American Association of Critical-Care Nurses*. 2016; 25:402-408.
20. Reifenberg G; Gabrosek G; Tanner K; Harpster K; Proffitt R; Persch A. **Feasibility of pediatric game-based neurorehabilitation using telehealth technologies: A case report.** *American Journal of Occupational Therapy*. 2017; 71:7103190040p1-7103190040p8.
21. Philpott-Robinson K; Lane AE; Harpster K. **Sensory Features of Toddlers at Risk for Autism Spectrum Disorder.** *American Journal of Occupational Therapy*. 2016; 70:7004220010p1-7004220010p8.
22. Keefe DH; Feeney MP; Hunter LL; Fitzpatrick DF. **Comparing otoacoustic emissions evoked by chirp transients with constant absorbed sound power and constant incident pressure magnitude.** *The Journal of the Acoustical Society of America*. 2017;

141:499-514.

23. Keefe DH; Feeney MP; Hunter LL; Fitzpatrick DF. **Comparisons of transient evoked otoacoustic emissions using chirp and click stimuli.** *The Journal of the Acoustical Society of America.* 2016; 140:1949- 1973.
24. Staveski SL; Wu M; Tesoro TM; Roth SJ; Cisco MJ. **Interprofessional Team's Perception of Care Delivery After Implementation of a Pediatric Pain and Sedation Protocol.** *Critical care nurse.* 2017; 37:66-76.
25. Yuan W; Harpster K; Jones BV; Shimony JS; McKinstry RC; Weckherlin N; Powell SS; Barnard H; Engsborg J; Kadis DS. **Changes of White Matter Diffusion Anisotropy in Response to a 6-Week iPad Application-Based Occupational Therapy Intervention in Children with Surgically Treated Hydrocephalus: A Pilot Study.** *Neuropediatrics: journal of pediatric neurobiology, neurology and neurosurgery.* 2016; 47:336-340.

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## Grants, Contracts, and Industry Agreements

### Annual Grant Award Dollars

Investigator	Title	Sponsor	ID	Dates	Amount	
Whittney J Brady, RN, DNP	Effects of Virtual Reality Simulation on Worker Emergency Evacuation of Neonates	Agcy for Healthcare Research and Quality (Wright State University)	R18 HS023149	09/30/2014	\$96,205	
				-		
David R Moore, PhD	Idiopathic Auditory Dysfunction in Children: Nature and Mechanisms	National Institutes of Health	R01 DC014078	08/01/2015	\$614,830	
				-		
Heather L Tubbs Cooley, PhD	Systems analysis of Guideline Adherence in Neonatal Intensive Care	National Institutes of Health	R21 HD084863	07/01/2016	\$248,991	
				-		
Tzipi Horowitz-Kraus, PhD	The Role of Executive Functions in Reading and Reading Remediation	National Institutes of Health	R01 HD086011	06/21/2016	\$999,729	
				-		
Joshua Courter Phar, MD	The Use of Vancomycin Beyond 4 Days of Therapy for Empiric Courses	ASHP Foundation	2016Excellence	12/01/2016	\$50,000	
				-		
Amy F Bailes PT, PhD	Toward a Practice Based Evidence Model for Studying Physical Therapy Dose in Cerebral Palsy	American Physical Therapy Association	APTA	01/01/2017	\$29,862	
				-		
Maryellen Daston	Healthy Lifestyles for People with Disabilities	Ohio Developmental Disabilities Council	17CH03FA17	01/01/2017	\$103,000	
				-		
					12/31/2021	
<b>Total Annual Grant Award Dollars</b>						<b>\$2,142,617</b>

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