2013 Research Annual Report

Physical Medicine and Rehabilitation

Cincinnati Children's

Division Details

Division Data Summary

RESEARCH AND TRAINING DETAILS	
Number of Faculty	7
Number of Research Students	4
Number of Support Personnel	10
Direct Annual Grant Support	$1,324,152
Direct Annual Industry Support	$21,678
Peer Reviewed Publications	27

CLINICAL ACTIVITIES AND TRAINING	
Number of Clinical Staff	1
Number of Clinical Fellows	2
Inpatient Encounters	3454
Outpatient Encounters	4525

Division Photo

Row 1: D Pruitt
Row 2: L Michaud, J Vargus-Adams, M McMahon
Row 3: S Wade, B Kurowski, D Kinnett

Significant Accomplishments

Research Advances Understanding of Brain Injury

Traumatic brain injury (TBI) is the leading cause of morbidity and mortality in children. However, there is a lack of evidence-based interventions to guide management of the sequelae of TBI. Brad Kurowski, MD, MS, and Shari Wade, PhD, have developed research collaborations nationally and across the institution to narrow this knowledge gap. Kurowski and Wade recently published results in the *Journal of Head Trauma Rehabilitation* and *Pediatrics* of a multi-center study evaluating the efficacy of web-based counselor-assisted problem solving for management of cognitive and behavioral sequelae of pediatric TBI. Kurowski also has obtained a five-year NIH grant to study the efficacy of methylphenidate for managing attention problems after moderate to severe TBI in children. He also collaborated in 2013 with Pediatric Research Imaging Center investigators, Gregory Lee, PhD, and Kim Cecil, PhD, and sports physical therapists, Jason Hugentobler, PT, DPT, CSCS and Catherine Quatman-Yates, PT, DPT, PhD, to obtain funding through the Ohio Department of Public Safety and Cincinnati Children's Trustees grant program to study the benefits and biologic correlates of aerobic exercise in managing pediatric post-concussion syndrome.

Three Studies Explore Brain Injury Recovery

Our Rehabilitation Research and Training Center on Interventions for Pediatric TBI, under Wade's direction, is enrolling patients in three multi-center randomized clinical trials addressing cognitive and behavioral consequences post-TBI. Kurowski and Wade also are collaborating with Lynn Babcock, MD, Emergency Medicine, to develop and test an innovative web-based intervention to facilitate recovery following mild TBI.

Collaborations Lead to Higher Volumes

Under Kurowski's leadership, we have continued clinical collaboration with the divisions of Sports Medicine, Neurology, Emergency Medicine, Trauma Surgery, Neurosurgery, and Behavioral Medicine to develop improved outpatient care models for children with TBIs. Through the work of this interdisciplinary group, the outpatient TBI program continues to grow at a rapid pace. Outpatient visits increased to over 1,900 visits this past year, which represents a 34 percent increase. Bridging research and clinical initiatives will be imperative to optimize care of children after TBI.

Division Publications

1. Adamson C, Yuan W, Babcock L, Leach JL, Seal ML, Holland SK, Wade SL. **Diffusion tensor imaging detects white matter abnormalities and associated cognitive deficits in chronic adolescent TBI**. *Brain Inj*. 2013; 27:454-63.
2. Antonini TN, Raj SP, Oberjohn KS, Wade SL. **An online positive parenting skills programme for paediatric traumatic brain injury: feasibility and parental satisfaction**. *J Telemed Telecare*. 2012; 18:333-8.
3. Arnett A, Peterson RL, Kirkwood MW, Taylor HG, Stancin T, Brown TM, Wade SL. **Behavioral executive dysfunction predicts outcomes in pediatric brain injury**. *Journal of Head Trauma Rehabilitation*. 27:e29.
4. Babcock L, Byczkowski T, Mookerjee S, Bazarian JJ. **Ability of S100B to predict severity and cranial CT results in children with TBI**. *Brain Inj*. 2012; 26:1372-80.
5. Guo X, Xiang J, Mun-Bryce S, Bryce M, Huang S, Huo X, Wang Y, Rose D, Degrauw T, Gartner K, Song T, Schmit J, Vargus-Adams J. **Aberrant high-gamma oscillations in the somatosensory cortex of children with cerebral palsy: a meg study**. *Brain Dev*. 2012; 34:576-83.
6. Karver CL, MacPherson H, Chiu P, Wade S, Taylor HG, Yeates KO , Walz NC. **Hot and cold executive functions following pediatric traumatic brain injury**. *Journal of the International Neuropsychological Society*. 19:197.
7. Kurowski B, Martin LJ, Wade SL. **Genetics and outcomes after traumatic brain injury (TBI): what do we know about pediatric TBI?**. *J Pediatr Rehabil Med*. 2012; 5:217-31.
8. Kurowski BG, Wade SL, Kirkwood MW, Brown TM, Stancin T, Taylor HG. **Online counselor assisted problem solving for executive dysfunction in adolescents after traumatic brain injury: a randomized controlled trial**. *American Journal of Physical Medicine & Rehabilitation*. 2013; 92:a6.
9. Kurowski BG, Wade SL, Kirwood MW. **Online Counselor–assisted problem solving for executive dysfunction in adolescents after traumatic brain injury: a randomized controlled trial**. *American Journal of Physical Medicine & Rehabilitation*. 2013; 92:a6.
10. Kurowski BG, Michaud L, Babcock L, Rhine T. **Pediatric Traumatic Brain Injury: Special Considerations**. In: ND Zasler, DI Katz, RD Zafonte, eds. *Brain Injury Medicine: Principles and Practice*. New York, NY: Demos; 2013:548-563.
11. Lee JB, Harn B, Sohlberg MM, Wade SL. **An Overview of the Attention Improvement Management**

(AIM) Program With Outcomes for Three Pilot Participants. *Perspectives on Neurophysiology & Neurogenic Speech & Language Disorders*. 2012; 22:90-105.

12. Mast JE, Antonini T, Raj SP, Makoroff K, Wade SL . **I-InTERACT Study Internet-Based Interacting Together Every Day: Recovering after Childhood TBI Pilot Study: TBI Inflicted by Abuse**. *Journal of Head Trauma Rehabilitation*. 27:e28.
13. Peterson RL, Kirkwood MW, Taylor HG, Stancin T, Brown TM, Wade SL. **Adolescents' Internalizing Problems Following Traumatic Brain Injury Are Related to Parents' Psychiatric Symptoms**. *J Head Trauma Rehabil*. 2012; .
14. Quatman-Yates C, Hugentobler J, Lee A, Kurowski B, Myer G, Riley M. (2013) **Reliability of force plate post-concussion evaluations**. Cincinnati, Gait and Clinical Movement Analysis Society. 43-44.
15. Raj SP, Antonini, T, MacPherson H, Taylor J, Sohlberg M, Hard B, Prideaux J, Wade SL. **Cognitive training targeting TBI related attention problems in adolescents**. *Journal of Head Trauma Rehabilitation*. 27:e30.
16. Rhine T, Wade SL, Makoroff KL, Cassedy A, Michaud LJ. **Clinical predictors of outcome following inflicted traumatic brain injury in children**. *J Trauma Acute Care Surg*. 2012; 73:S248-53.
17. Riegler LJ, Neils-Strunjas J, Boyce S, Wade SL, Scheifele PM. **Cognitive intervention results in web-based videophone treatment adherence and improved cognitive scores**. *Med Sci Monit*. 2013; 19:269-75.
18. Riegler LRJ, Wade SL, Neils-Strunjas J. **A web-based cognitive therapy intervention for Veterans with mild traumatic brain injury**. *eHearsay*. 2012; 2:5-17.
19. Vargus-Adams JN. **An urgency about bladder dysfunction in cerebral palsy**. *Dev Med Child Neurol*. 2012; 54:877-8.
20. Vargus-Adams JN. **The conceptualization of participation**. *Dev Med Child Neurol*. 2012; 54:777.
21. Vargus-Adams JN, Farrell J, Morgan-DeWitt E, Jacobson C. **I don't think she sees herself the way she truly is': a qualitative analysis of concordance/discordance in child and parent representations and reports of physical functioning associated with cerebral palsy**. *Developmental Medicine and Child Neurology*. 2012; 54:51.
22. Vargus-Adams JN, Kinnett D, Wnek L, Reder RD, McCarthy J, Timme E, Murphy M. **Immersive research-based design thinking identifies strategies for innovative cerebral palsy care**. *Developmental Medicine and Child Neurology*. 2012; 54:40-41.
23. Visscher M, King A, Nie AM, Schaffer P, Taylor T, Pruitt D. **A quality improvemnt collaborative project to reduce pressure ulcers in PICUs**. *Pediatrics*. 2013; 131:e1950-60.
24. Visscher M, King A, Nie AM, Schaffer P, Taylor T, Pruitt D. *Pediatrics*. 2013; 131:e1950-60.
25. Wade SL, Taylor HG, Stancin T, Kirkwood MW, Brown TM. **Counselor Assisted Problem Solving for Adolescent TBI-Improvements in Behavior**. *Journal of Head Trauma Rehabilitation*. 27:e24.
26. Wade SL, Walz NC, Carey J, McMullen KM, Cass J, Mark E, Yeates KO. **A randomized trial of teen online problem solving: efficacy in improving caregiver outcomes after brain injury**. *Health Psychol*. 2012; 31:767-76.
27. Wade SL, Glang A, Kirkwood MW, Sohlberg M, Stancin T, Taylor HG, Yeates KO. **Rehabilitation Research and Training Center for Pediatric TBI Interventions**. *Journal of Head Trauma Rehabilitation*. 27:e23.

Faculty, Staff, and Trainees

Faculty Members

Linda Michaud, MD, MEd, Professor

Leadership Division Director; Aaron W. Perlman Professor; Co-Director, Cincinnati Children's Brachial Plexus Center

Research Interests Outcomes and effectiveness of interventions after pediatric neurotrauma - birth brachial plexus palsy, brain injury.

Douglas Kinnett, MD, Associate Professor

Leadership Director, Spasticity Management Program; Clinical Director, Cerebral Palsy Center

Research Interests Outcomes and effectiveness of interventions for spasticity in cerebral palsy, use of electrodiagnosis in management in birth brachial plexus palsy.

Brad Kurowski, MD, MS, Assistant Professor

Research Interests Genetic influence on cognitive and behavioral recovery after mild pediatric traumatic brain injury.

Mary McMahon, MD, Associate Professor

Leadership Director, Residency Training Program, UC Dept. of PM&R; Director, Medical Student Education, UC Dept. of PM&R

Research Interests Outcomes and effectiveness of interventions in muscular dystrophy.

David Pruitt, MD, Assistant Professor

Leadership Director, A4Rehab; Director, Pediatric Rehabilitation Medicine Fellowship

Research Interests Functional outcomes in children with brain tumors.

Jilda Vargus-Adams, MD, MSc, Assistant Professor

Leadership Research Director, Cerebral Palsy Center

Research Interests Outcome measurement and effectiveness of interventions for cerebral palsy.

Shari Wade, PhD, Professor

Leadership Director of Research

Research Interests Outcomes and effectiveness of interventions after pediatric traumatic brain injury.

Clinical Staff Members

Lainie Holman, MD

Trainees

Paola Mendoza, MD, PGY-6, East Carolina University
Laura Hobart-Porter, DO, PGY-5, University of Arkansas Medical Sciences
Ashlee Brown, MD, PGY-4, University of Missouri Columbia
Erin Swanson, MD, PGY-3, Medical College of Wisconsin
Nathan Evanson, MD, PhD, PGY-3, University of Cincinnati
Andrea Paulson, MD, PGY-2, University of Minnesota Medical School. Minneapolis
Andrew Collins, MD, PGY-1, University of Medicine and Dentistry of New Jersey - New Jersey Medical School

Division Collaboration

Orthopaedics; Orthopaedics; Orthopaedics; Plastic Surgery; Plastic Surgery; Physical Medicine and

Rehabilitation » Charles Mehlman, DO, Roger Cornwall, MD, Kevin Little, MD, Kevin Yakuboff, MD, Ann Schwentker, MD, and Linda Michaud, MD

Brachial Plexus Center: A multi-disciplinary program for the treatment of pediatric brachial plexus and Erb's Palsy. The Brachial Plexus Center is actively involved in clinical research to advance the quality and effectiveness of care of children with brachial plexus injuries.

Orthopaedics; Physical Medicine and Rehabilitation » Charles Mehlman, DO and Linda Michaud, MD

Limb Reconstruction Clinic: A multi-disciplinary clinic for children with congenital limb deficiencies with and without prosthetic needs, for the treatment of complications after injury and the correction of limb deformity including limb lengthening.

Emergency Medicine; Emergency Medicine; Behavioral Medicine and Psychology; Sports Medicine; Neurology; Pediatric General and Thoracic Surgery; Physical Medicine and Rehabilitation » Michael Gittelman, MD, Wendy Pomerantz, MD, Abigail Johnson, PhD, Teri McCambridge, MD, Todd Arthur, MD, Richard Falcone, MD, and Brad Kurowski, MD

Comprehensive Children's Injury Center (CCIC) Head Injury Subcommittee: Multidisciplinary committee focused on improving the care of children with traumatic brain injuries with focus on developing a multi-disciplinary head injury clinic.

Sports Medicine; Sports Medicine; Physical Medicine and Rehabilitation » Catherine Quatman-Yates, PhD, Jason Hugentobler, MD, and Brad Kurowski, MD

Sponsor: University of Cincinnati, University Research Council (URC) Postdoctoral Fellow Research Program Grant

Title: The utility of the Balance Error Scoring System (BESS) for post-concussion evaluation in children and adolescents

Objective: To determine the utility of BESS for the evaluation of concussions in the pediatric population.

Human Genetics; Physical Medicine and Rehabilitation; Physical Medicine and Rehabilitation » Lisa Martin, PhD, Shari Wade, PhD, and Brad Kurowski, MD

Sponsor: NIH/NICHD/NCMRR/AAP

Title: Genetic Influence on Cognitive and Behavioral Recovery after Pediatric Traumatic Brain Injury

Objective: The goal of this project is to evaluate the association of catecholamine related polymorphisms with cognitive and behavioral recovery after pediatric traumatic brain injury. This is part of the Rehabilitation Medicine Scientist Training Program (RMSTP) K-12 grant.

Human Genetics; Physical Medicine and Rehabilitation; Physical Medicine and Rehabilitation » Lisa Martin, PhD, Shari Wade, PhD, and Brad Kurowski, MD

Sponsor: Ohio Department of Public Safety Grant

Title: Long-term Executive, Behavioral, and Psychosocial Functioning After Adolescent Traumatic Brain Injury: Importance of Environment, Genetics, and a Behavioral Intervention

Objective: Evaluate the role of and interaction among genetic and various environmental factors in long-term recovery after adolescent traumatic brain injury.

Pediatric General and Thoracic Surgery; Physical Medicine and Rehabilitation » Richard Falcone, MD and Brad Kurowski, MD

Sponsor: Ohio Department of Public Safety Grant

Title: Traumatic Brain Injury Symptom Screening and Resolution Prediction

Objective: Characterize the duration of symptoms after mild traumatic brain injury and factors that predict the trajectory of recovery.

Hematology/Oncology; Hematology/Oncology; Physical Medicine and Rehabilitation » John Perentesis, MD, Maryam Fouladi, MD, and David Pruitt, MD

Neuro-Oncology Clinic: A multi-disciplinary program providing comprehensive treatment for children with neurological tumors.

Oncology; Physical Medicine and Rehabilitation » Rajaram Nagarajan, MD and David Pruitt, MD

Oncology Clinic: A multidisciplinary program providing comprehensive treatment for children with sarcomas, leukemia and lymphoma.

Neurology; Physical Medicine and Rehabilitation » Marielle Kabbouche, MD and Jilda Vargus-Adams, MD

Stroke Clinic: A multi-disciplinary program that provides comprehensive treatment for children with stroke.

Neurology; Neurology; Physical Medicine and Rehabilitation » Donald Gilbert, MD, Steve Wu, MD, and Jilda Vargus-Adams, MD

Research into combined occupational therapy and transcranial magnetic stimulation for hemiparetic cerebral palsy.

Rheumatology; Rheumatology; Physical Medicine and Rehabilitation » Esi Morgan-Dewitt, MD, Susmita Kashikar-Zuk, MD, and Jilda Vargus-Adams, MD

A U01 grant evaluating a patient reported outcome measure for use in pediatric pain, rheumatology, and rehabilitation research.

Orthopaedics; Physical Medicine and Rehabilitation » James McCarthy, MD and Jilda Vargus-Adams, MD

Orthopaedic Surgery/PM R CP Clinic: A multi-disciplinary clinic that provides evaluation and treatment planning for children with cerebral palsy.

Neurology; Physical Medicine and Rehabilitation » Brenda Wong, MD and Mary McMahon, MD

Comprehensive Neuromuscular Center: A multi-disciplinary clinic providing comprehensive treatment for children with neuromuscular disorders.

Developmental and Behavioral Pediatrics; Physical Medicine and Rehabilitation » Sonya Oppenheimer, MD and Mary McMahon, MD

Myelomeningocele Clinic: A multi-disciplinary clinic which deals with the treatment of children with myelomeningocele.

Orthopaedics; Physical Medicine and Rehabilitation » Peter Sturm, MD and Douglas Kinnett, MD

Spine Center: A multi-disciplinary program that provides comprehensive treatment for children with congenital and acquired abnormalities of the spine.

Behavioral Medicine and Psychology; Physical Medicine and Rehabilitation » Nicolay Chertkoff Walz, PhD and Shari Wade, PhD

Dr. Walz has received mentoring from Dr. Wade and is currently co-investigator on Dr. Wade's competing continuation project examining long-term functional outcomes of early childhood TBI and her Rehabilitation Research and Training Grant for Pediatric TBI Interventions.

Neuroimaging Research Consortium; Neuroimaging Research Consortium; Physical Medicine and Rehabilitation » Weihong Yuan, PhD and Shari Wade, PhD

Completing analyses and write up of grants from the Ohio Emergency Medical Services and the UC Interdisciplinary Research Grants.

Emergency Medicine; Emergency Medicine; Emergency Medicine; Physical Medicine and Rehabilitation » Lynn Babcock, MD, Michael Gittleman, MD, Wendy Pomerantz, MD, and Shari Wade, PhD

Dr. Wade is primary mentor for Dr. Babcock's KL2 award investigating predictors of recovery from mild TBI.

Emergency Medicine; Emergency Medicine; Pediatric General and Thoracic Surgery; Physical Medicine and Rehabilitation » Michael Gittleman, MD, Wendy Pomerantz, MD, Richard Falcone, MD, and Shari Wade, PhD

Dr. Wade is part of the steering committee for the Cincinnati Children's Comprehensive Injury Center.

Bioinformatics; Physical Medicine and Rehabilitation » Keith Marsolo, PhD and Shari Wade, PhD

Dr. Marsolo is a collaborating investigator on the five-year RRTC grant for pediatric TBI interventions.

International Adoption Center/Division of Infectious Diseases; Physical Medicine and Rehabilitation » Mary Allen Staat, MD and Shari Wade, PhD

Drs. Staat and Wade are completing the write-up of several previously completed projects including one funded by an Interdisciplinary Research grant from UC.

Grants, Contracts, and Industry Agreements

Grant and Contract Awards		Annual Direct
KUROWSKI, B		
Genetic Influence on Cognitive and Behavioral Recovery After Mild Pediatric Traumatic Brain Injury		
National Institutes of Health(University of Pittsburgh)		
K12 HD 001097	07/01/10-06/30/13	$106,000
VARGUS-ADAMS, J		
Combined FES and Robotic Gait Training in Childhood CP		
Cerebral Palsy International Research Fund		
	09/01/10-08/31/13	$43,478
WADE, S		
Long Term Functional Outcomes of Early TBI		
National Institutes of Health		
R01 HD 042729	09/01/09-08/31/14	$406,036
Rehabilitation Research and Training Center for Traumatic Brain Injury		
US Department of Education		
H133B090010	10/01/09-09/30/14	$768,638
	Current Year Direct	**$1,324,152**

Industry Contracts	
KINNETT, D	
Tercica, Inc.	$21,678

Current Year Direct Receipts	**$21,678**
Total	**$1,345,830**