

BIOGRAPHICAL SKETCH

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NAME: Jill C. Heathcock

eRA COMMONS USER NAME (credential, e.g., agency login): JCHEATHCOCK02

POSITION TITLE: Associate Professor

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of Dayton, Dayton, Ohio	BS	12/1998	Exercise Science
University of Delaware, Newark, Delaware	MPT	6/2001	Physical Therapy
University of Delaware, Newark, Delaware	PhD	7/2006	Biomechanics
University of Michigan, Ann Arbor, Michigan	Fellow	7/2007	Infant Development

A. Personal Statement

As the director of the Pediatric and Rehabilitation Laboratory (PeaRL lab) and Associate Professor at The Ohio State University I have the expertise, leadership, training, and motivation necessary to successfully carry out the Techniques Development Core of this National Pediatric Rehabilitation Resource Center (*PedRehab Ctr*) to offer research infrastructure supports to improve investigators capacity to conduct rigorous clinical trials to test and later effectively implement evidence-based interventions in pediatric medical rehabilitation. I have a strong background in pediatric physical therapy and child development with specific training and expertise in observational, pragmatic, and clinical trials research on aspects of pediatric rehabilitation. My research includes motor impairments associated with brain injury and disability. As a scientist I aim to support, advance, and inspire innovative research in pediatric physical therapy. My research encompasses three major areas: (1) Physical therapy and rehabilitation for pediatric populations; (2) Identifying typical and atypical features of upper and lower extremity movements in children; and (3) Detecting developmental impairments in infant populations at high-risk for motor delay. As PI or co-investigator on several NIH- and PCORI-funded grants, I am actively studying the effects of dosing of rehabilitation for infants and children with cerebral palsy. My emphasis is on gross motor skills, child development across multiple domains, and patient-centered outcome measures. Many of my studies investigate behavioral, biomechanical, and clinical features. I have supervised and trained OT, PT, MD, and PhD students, post-doctoral fellows, and health care professionals.

1. Ferrante R, Hendershot S, Baranet K, Barbosa G, Carey H, Maitre N, Lo W, Pan J, & **Heathcock JC**. Daily and weekly rehabilitation delivery for young children with gross motor delay: A randomized clinical trial protocol (the DRIVE Study). *Pediatr Phys Ther*. 2019 Mar 8 [Epub ahead of print] PMID: 30865149
2. Carey H, Martin K, Combs-Miller S, **Heathcock JC**. Reliability and responsiveness of the Timed Up & Go Test in children with cerebral palsy. *Pediatr Phys Ther*. 2016 Winter;28(4):401-8.
3. Chorna O, **Heathcock JC**, Key A, Noritz G, Carey H, Hamm E, Nelin MA, Murray M, Needham A, Slaughter JC, Maitre NL. Early childhood constraint therapy for sensory/motor impairment in cerebral palsy: A randomised clinical trial protocol. *BMJ Open*. 7;5(12):2015. PMID: 26644127

B. Positions and Honors

Employment

2001 - 2004	Physical Therapist, University of Delaware Orthopedic Clinic
2001 - 2005	Physical Therapist, Pediatric Therapeutic Services, West Chester, PA
2001 - 2006	Research Assistant, Infant Motor Behavior Laboratory, University of Delaware
2003 - 2006	Pre-doctoral Trainee, NIH T32-HR7490: PT/PhD Pre-doctoral training program, University of Delaware
2006 - 2007	Post-Doctoral Fellow, Motor Development Laboratory, University of Michigan
2007 - 2016	Assistant Professor, Division of Physical Therapy, Ohio State University
2009 - 2016	Assistant Professor, Pediatrics, College of Medicine, The Ohio State University
2009 -	Adjunct Appointment, Center for Perinatal Research, Nationwide Children's Hospital
2016 -	Associate Professor, Division of Physical Therapy, Ohio State University
2016 -	Associate Professor, Pediatrics, College of Medicine, The Ohio State University
2016 - 2017	Visiting Professor, Hôpital Jeanne de Flandre, L'Université Lille 2 - Droit & Santé

Other Experience and Professional Membership:

1999-	American Physical Therapy Association Pediatric Section 2002-present Research Section 2004- present
2001, 2006	Society for Neuroscience
2002 – 2008,12	International Society for Infant Studies
2002, 05 -08	North American Society for the Psychology of Sport and Physical Activity
2014-	American Heart Association, Clinical Outcomes Study Section, member
2017, 2018	National Institutes of Health, MFSR study section, ad hoc reviewer

Honors:

2005	Dorothy Briggs Memorial Scientific Inquiry Award
2006	Dissertation Award Pediatric section of the APTA
2011	School of Allied Medical Professions Research Award
2011	Faculty Teaching Scholars Certificate Program
2011	Faculty Research Award for School of Health and Rehabilitation Sciences
2013	Early Career Women Faculty Professional Development Seminar, American Academy of Medical Colleges
2014	Editorial Board Member, <i>Physical Therapy Journal</i>
2014	Senator, The Ohio State University Senate
2016	Fulbright Scholar, University of Lille 2, Lille, France
2017	Editorial Board member, <i>Physical & Occupational Therapy in Pediatrics</i>
2018	Alternate, The Ohio State University Senate
2019	Alternate, The Ohio State University Senate

C. Contributions to Science

1. Appropriate dosing of neurorehabilitation for pediatric populations has been identified as a national priority. My recent funding and publications address important clinical and theoretical issues of dosing, including principles of motor learning and the need for sufficient repetition of movement to achieve functional changes. These publications document that high-intensity neurorehabilitation for infants and their families is feasible and may produce a burst in motor skill development that has trickle down effects into other domains of child development. A review of the state of the science in dosing for children with CP and a theoretical path model for research studies and clinical care contributes to guiding principles of high-intensity neurorehabilitation of pediatric populations.

- a. Ferrante R, Hendershot S, Baranet K, Barbosa G, Carey H, Maitre N, Lo W, Pan J, & **Heathcock JC**. Daily and weekly rehabilitation delivery for young children with gross

motor delay: A randomized clinical trial protocol (the DRIVE Study). *Pediatr Phys Ther.* 2019 Mar PMID: 30865149

- b. **Heathcock JC**, Baranet K, Ferrante R, & Hendershot, S. Daily intervention for toddlers with cerebral palsy in GMFCS level V - A case series. *Pediatr Phys Ther.* Summer;27(3):285-92. 2015. PMID: 25974119
- c. Gannotti ME, Christy JB, **Heathcock JC**, & Kolobe TH. A path model for evaluating dosing parameters for children with cerebral palsy. *Physical Therapy Journal.* 2014; 94 (3): 411-421.
- d. Kolobe TH, Gannotti ME, Christy JB, **Heathcock JC**, et al. Research Summit III Proceedings on dosing in children with an injured brain or cerebral palsy: Executive summary. *Physical Therapy Journal.* 2014; 94 (7): 907- 920.

2. My publications with collaborators address atypical features of upper and lower extremity movements. We identify and synthesize atypical upper extremity behaviors in preterm infants, infants with neonatal stroke, and children with cerebral palsy using behavioral, biomechanical, and clinical measures. Using these measures has the potential for accurate assessment of disability and providing therapeutics targets for rehabilitation. These publications combine early identification and targeted treatments focused on high-intensity, daily, parent focused, active exploration to improve upper and lower extremity skills like reach-and-grasp. This collaborative work spans my career from PhD student to Associate Professor with more recent publications highlighted.

- a. Machado L, **Heathcock JC**, Carvalho R, Pereira N, Tudella E. Kinematic characteristics of arm and trunk when drinking from a glass in children with and without cerebral palsy. *Clin Biomec* 2019 Mar;63:201-206. PMID: 30925379
- b. Lobo M, Galloway JC, & **Heathcock JC**. Characterization of an intervention for upper extremity exploration & reaching behaviors in infancy. *The Journal of Hand Therapy.* Apr - Jun; 28 (2): 114-25. 2015. PMID: 25835251
- c. Chen CY, Tafone S, Lo WD, & **Heathcock JC**. A perinatal stroke causes abnormal trajectory and laterality in reaching during early infancy. *Research in Developmental Disabilities.* Mar; 38 (3): 3001-8. 2015. PMID: 25577180
- d. Chen CY, Lo WD, & **Heathcock JC**. Neonatal stroke causes poor midline motor behaviors and poor fine and gross motor skills during early infancy. *Research in Developmental Disabilities.* 2013; 34 (3): 1011-7.

4. I have also documented neurodevelopmental impairments in other high-risk infant populations such those with complex congenital heart disease and autism. This body of work discusses the prevalence of sensorimotor impairments in complex infant populations and how clinical approaches can be used to identify these impairments. These studies emphasize individual patient characteristics, and combinations of clinical assessment tools and laboratory methods to guide referral and early intervention for populations where motor skill development has historically not been a primary concern because their medical or behavioral impairments are so multifaceted. As a result we have a better understanding of atypical sensorimotor impairment in these populations.

- a. Harrison TM, Chen CY, Stein P, Brown R, & **Heathcock JC**. Neonatal skin-to-skin contact: Implications for learning and autonomic nervous system function in infants with congenital heart disease. *Biol Res Nurs.* 2019 Feb 5 PMID: 30722675
- b. **Heathcock JC**, Tanner K, Young R, Robson D, & Lane AE. Retrospective analysis of motor development in infants at risk for ASD. *American Journal of Occupational Therapy.* 2015 Sep-Oct;69(5)
- c. Chen CY, Harrison TM, & **Heathcock JC**. Infants with complex congenital heart diseases show poor short-term memory in the mobile paradigm at three months of age. *Infant Behavior and Development.* Apr; 40: 12-19. 2015. PMID: 25919428.
- d. Cheatham S, Carey H, Chisolm, J, **Heathcock JC**, & Steward D. Early results of neurodevelopment following hybrid stage I for hypoplastic left heart syndrome. *Pediatric Cardiology.* Mar; 36 (3): 685-91. 2015. PMID: 25380966

Complete List of Published Work in MyBibliography:

<http://www.ncbi.nlm.nih.gov/sites/myncbi/collections/bibliography/47464207>

D. Current and Completed research support

Current:

1R01HD09483001. National Institutes of Health.

Title: Play & Learning across a Year (PLAY).

Principal Investigators: Karen Adolph, Rick Gilmore, & Catherine Tamis- LeMonda.

2019 – 2024

Role: Site Principal Investigator

1U01NS10665501. National Institutes of Health.

Title: Perinatal Arterial Stroke: A Multi-site RCT of Infant Rehabilitation (I-ACQUIRE).

Principal Investigators: Sharon Ramey & Warren Lo

2019 – 2024

Role: Co-Investigator primary award; Co-Director (with Darragh) of the Assessment Core.

2015C2-1507-31899. Patient-Centered Outcomes Research Institute (PCORI)

Title: A comparison: High intense periodic vs. every week therapy in children with cerebral palsy (ACHIEVE)

2016-2020

Role: Principal Investigator

1R01HD083384-01A1. National Institutes of Health

Title: Daily and weekly Rehabilitation Delivery for young children with Cerebral Palsy (DRIVE Study).

2016-2021

Role: Principal Investigator

1 R01 HD081120-01A1. National Institutes of Health

Title: Early childhood constraint therapy for sensory/motor impairment in cerebral palsy (APPLES)

Principal Investigator: Nathalie Maître

2015-2019

Role: Co-Investigator

1R01HD074574-01A1. National Institutes of Health

Title: Multisite RCT of 3 neuro-rehabilitation therapies for infants with asymmetrical cerebral palsy (BabyCHAMP).

Principal Investigators: Sharon Ramey and Stephanie DeLuca

2014 – 2018

Role: Site Co-Investigator

Completed:

16GRNT27760156. The American Heart Association and The Children's Heart Foundation.

Title: Informing developmental screening and evaluation procedures for young infants with complex congenital heart defects

2016 – 2018

Role: Principal Investigator

No number. Fulbright-Hays

Title: Adding motor and cognitive indicators of health and disability in high-risk mothers and infants

2016-2017

Role: Fulbright Research Scholar. Université de Lille 2 Droit et Santé in Lille France

No Number. Cure SMA Foundation

Title: Refinement of an innovative outcome measure to define disease progression in spinal muscular atrophy type 1 for use in the home or clinic.

2015 – 2017

Role: Principal Investigator (MPI: Linda Lowes)

No Number. National Institutes of Health Pediatric Loan Repayment Program.

2014-2016: Second renewal

Role: Principal Investigator

No Number. Foundation for Physical Therapy

Title: Transcranial Magnetic Stimulation in Children with Hemiparesis 2012 – 2014

Role: Principal Investigator

1R13HD070615-01 2011.

Title: Dosing and Motor Learning in Children with an Injured Brain or Cerebral Palsy. Principal Investigator: Hlapang A Kolobe, PHD

2011

Role: Co-Investigator/Faculty

No Number. Foundation for Physical Therapy Title: Training in Infants with Neonatal Stroke

2009 – 2011

Role: Principal Investigator