

## CURRICULUM VITAE

**Name:** Richard T. Lauer, PhD  
**Address:** 3307 North Broad Street, Jones Hall, Room 605  
Philadelphia PA, 19140  
**Phone:** 215-707-5964

**Name of Educational Program and Institution:** Department of Physical Therapy, College of Health Professions and Social Work, Temple University

### Education:

1996-2001 Case Western Reserve University, Cleveland, Ohio  
PhD in Biomedical Engineering

1993-1996 Case Western Reserve University, Cleveland, Ohio  
MS in Biomedical Engineering

1989-1993 The Catholic University of America, Washington DC  
BBE (Bachelor of Biomedical Engineering)

### Licensure Information/Registration Number:

N/A

### Certification(s):

N/A

### Employment and Positions Held:

2014-present Associate Professor, Department of Physical Therapy, College of Health Professions and Social Work, Temple University, Philadelphia , PA

2014-present Associate Professor, Department of Electrical and Computer Engineering, College of Engineering, Temple University, Philadelphia, PA

2008-2014 Assistant Professor, Department of Physical Therapy, College of Health Professions and Social Work, Temple University, Philadelphia , PA

2009-2014 Assistant Professor, Department of Electrical and Computer Engineering, College of Engineering, Temple University, Philadelphia, PA

2006-2008 Assistant Investigator, Shriners Hospital for Children, Philadelphia, PA

2002-2006 Research Associate, Shriners Hospital for Children, Philadelphia, PA

2002-2008 Visiting Research Assistant Professor (adjunct faculty), School of Biomedical Engineering, Science and Health Systems, Drexel University, Philadelphia, PA

2002-2008

Adjunct Faculty, Programs in Rehabilitation Science, Drexel University,  
Philadelphia, PA

**Peer Reviewed Publications:**

Slaboda JC, Lauer RT, Keshner EA. Postural responses of adults with cerebral palsy to combined base of support and visual field rotation. Institute of Electrical and Electronics Engineers (IEEE) Transactions on Neural Systems and Rehabilitation Engineering Mar;21(2):218-24, 2013.

Muth S, Barbe MF, Lauer R, McClure PW. The Effects of Thoracic Spine Manipulation in Subjects with Signs of Rotator Cuff Tendinopathy. Journal of Orthopedics & Sports Physical Therapy. Dec;42(12):1005-16, 2012.

Pierce SR, Prosser LA, Lee SC, Lauer RT. The Relationship Between Spasticity and Muscle Volume of the Knee Extensors in Children With Cerebral Palsy. Pediatric Physical Therapy ;24(2):177-181, 2012.

Johnston TE, Modlesky CM, Betz RR, Lauer RT. Muscle Changes Following Cycling and/or Electrical Stimulation in Pediatric Spinal Cord Injury. Archives of Physical Medicine & Rehabilitation ; 92(12):1937-43, 2011.

Johnston TE, Watson KE, Ross SA, Gates PE, Gaughan JP, Lauer RT, Tucker CA, Engsberg JR. Effects of a supported speed treadmill training exercise program on impairment and function for children with cerebral palsy. Developmental Medicine & Child Neurology;53(8):742-50. 2011

Lauer RT, Smith BT, Mulcahey MJ, Betz RR, Johnston TE. Effects of Cycling and/or Electrical Stimulation on Bone Mineral Density in Children with Spinal Cord Injury. Spinal Cord, 49(8):917-23, 2011.

Slaboda JC, Lauer RT, Keshner EA. Continuous Visual Field Motion Impacts the Postural Responses of Older and Younger Women During and After Support Surface Tilt. Experimental Brain Research. 211(1):87-96, 2011.

Slaboda JC, Lauer R, Keshner EA. Time Series Analysis of Postural Responses to Combined Visual Pitch and Support Surface Tilt. Neuroscience Letters;491(2):138-42, 2011.

Prosser LA, Lee SCK, Barbe MF, Van Sant A, Lauer RT. Trunk and hip muscle activity in early walkers with and without cerebral palsy – a frequency analysis. Journal of Electromyography & Kinesiology, 20(5):851-859, 2010.

Prosser LA, Lee SCK, Barbe MF, Van Sant A, Lauer RT. Trunk and Hip Muscle Activation Patterns Are Different During Walking in Young Children With and Without Cerebral Palsy. Physical Therapy, 90(7):986-997, 2010.

Prosser LA, Lauer RT, Van Sant A, Barbe MF, Lee SCK. Variability and symmetry of gait in early walkers with and without bilateral cerebral palsy. Gait&Posture, 31(4):522-526, 2010.

Pierce SR, Prosser LA, Lauer RT. The Relationship between Age and Spasticity in children with Cerebral Palsy. Archives of Physical Medicine and Rehabilitation. 91(3):448-451, 2010.

Lauer RT, Pierce SR, Tucker CA, Barbe MF, Prosser LA. Age and Electromyographic Frequency Alterations during Walking in Children with Cerebral Palsy. Gait & Posture. 31(1):136-139, 2010.

Johnston TE, Smith BT, Mulcahey MJ, Betz RR, Lauer RT. A Randomized Controlled Trial on the Effects of Cycling with and without Electrical Stimulation on Cardiorespiratory Health in Children with Spinal Cord Injury. Archives of Physical Medicine and Rehabilitation. 90(8):1379-1388, 2009.

McRae CGA, Johnston TE, Lauer RT, Tokay AM, Lee SCK, Hunt KJ. Cycling for Children with Neuromuscular Impairments using Electrical Stimulation - Development of Tricycle-based Systems. Medical Engineering & Physics. 31(6):650-659, 2009.

Lauer RT, Prosser LA. Teager-Kaiser Energy Operation for Muscle Activity Assessment in Pediatric Gait. Annals of Biomedical Engineering. 37(8):1584-1593, 2009.

Johnston TE, Betz RR, Lauer RT. The Impact of Cycling on Hip Subluxation in Children with Spinal Cord Injury. Journal of Pediatric Orthopedics, 24(9):402-4054, 2009.

Pierce SR, Lauer RT, Prosser LA, Mohamed, FB, Dougherty JB, Faro SH, Betz RR. Incidental Findings during fMRI: A Pediatric Case Report. American Journal of Physical Medicine & Rehabilitation, 88(4), 275-277, 2009.

Johnston TE, Lauer RT, Lee SCK. The Effects of a Shank Guide on Cycling Biomechanics of an Adolescent with Cerebral Palsy. Archives of Physical Medicine and Rehabilitation, 89(10), 2025-2030, 2008.

Pierce SR, Barbe MF, Barr AE, Shewokis PA, Lauer RT. The Roles of Reflex Activity and Co-contraction during the Assessment of Spasticity of Knee Flexors and Knee Extensors in Children with Cerebral Palsy with Different Functional Levels. Physical Therapy, 88 (10), 1124-1134, 2008.

Johnston TE, Smith BT, Oladeji O, Betz R, Lauer RT. Outcomes of a Home Cycling Program with or without Functional Electrical Stimulation for Children with Spinal Cord Injury: A Case Series. Journal of Spinal Cord Medicine, 31(2), 215-221, 2008.

Pierce SR, Johnston TE, Shewokis PA, Lauer RT. Examination of spasticity of the knee flexors and knee extensors using isokinetic dynamometry with EMG and clinical scales in children with spinal cord injury. Journal of Spinal Cord Medicine, 31(2): 208-214, 2008.

Johnston TE, Smith BT, Betz RR, Lauer RT. Exercise Testing using Upper Extremity Ergometry in Pediatric Spinal Cord Injury. Pediatric Physical Therapy, 20(2): 146-151, 2008.

Lauer RT, Johnston TE, Smith BT, Lee SCK. Lower Extremity Muscle activity during cycling in adolescents with and without cerebral palsy. Clinical Biomechanics, 23(4):442-449, 2008.

Oladeji O, Johnston TE, Smith BT, Mulcahey MJ, Betz RR, Lauer RT. Quality of Life in Children with Spinal Cord Injury. Pediatric Physical Therapy, 19(4), 296-300, 2007.

Pierce SR, Barbe M, Barr A, Shewokis PA, Lauer RT. Co-contraction during passive movements of the knee joint in children with cerebral palsy. *Clinical Biomechanics*, 22(9), 1045-1048, 2007.

Lauer R, Johnston TE, Smith BT, Mulcahey MJ, Betz RR, Maurer AH. Bone Mineral Density of the Hip and Knee in Children with Spinal Cord Injury. *Journal of Spinal Cord Medicine*, 30:S10-S14, 2007.

Lauer RT, Stackhouse CA, Shewokis PA, Tucker CA, Smith BT, McCarthy JJ. A Time-Frequency Based Electromyographic Analysis Technique for Use in Cerebral Palsy. *Gait & Posture*, 26(3), 420-427, 2007.

Lauer RT, Smith BT, Shewokis PA, McCarthy JJ, Tucker CA. Time-Frequency Changes in Electromyographic Signals After Hamstring Lengthening Surgery in Children with Cerebral Palsy. *Journal of Biomechanics*, 40(12), 2738-2743, 2007.

Pierce SR, Lauer RT, Shewokis PA, Rubertone JA, Orlin MN. Test-retest reliability of isokinetic dynamometry for the assessment of spasticity of the knee flexors and knee extensors in children with cerebral palsy. *Archives of Physical Medicine and Rehabilitation*, 87(5), 697-702, 2006.

Lauer RT, Smith BT, Betz R. Application of a Neuro-Fuzzy Network for Gait Event Detection Using Electromyography in the Child with Cerebral Palsy. *IEEE Transactions on Biomedical Engineering*, 52(9), 1532-1540, 2005.

Lauer RT, Stackhouse C, Shewokis PA, Smith B, Orlin M, McCarthy J. Assessment of Wavelet Analysis of Gait in Children with Typical Development and Cerebral Palsy. *Journal of Biomechanics*, 38(6), 1351-1357, 2005.

Pierce SR, Orlin MN, Lauer RT, Johnston TE, Smith BT, McCarthy JJ. Comparison of percutaneous and surface functional electrical stimulation during gait in a child with hemiplegic cerebral palsy. *American Journal of Physical Medicine & Rehabilitation*, 83(10), 798-805, 2004.

Lauer RT, Smith B, Coiro D, Betz R, McCarthy J. Feasibility of Gait Event Detection Using Intramuscular Electromyography to Trigger Electrical Stimulation in the Child with Cerebral Palsy. *Neuromodulation*, 7(3), 205-213, 2004.

### **Peer Reviewed Scientific and Professional Presentations:**

Yu, Y., Keshner, E.A., Thompson, E. D., Tucker, C. A., & Lauer, R. T. (2016, February). Visual dependence influences postural responses to visual perturbation in adults with spastic cerebral palsy. To be presented at the Combined Sections Meeting of American Physical Therapy Association 2016, Anaheim, CA, USA.

Chudnovskaya, I., Yu, Y., Snell, S., & Lauer, R. T. (2015, May). Characterizing muscle response to base of support perturbation in adults with spastic cerebral palsy. Presented at Temple University College of Public Health Research Day 2015, Philadelphia, PA, USA.

Youwakim, C., Yu, Y., & Lauer, R. Y. (2015, May). The impact of visual dependence on

strategies of segmental stabilization in relation to visual perturbation in spastic cerebral palsy. Presented at Temple University Neuroscience Program Research Day 2015, Philadelphia, PA, USA.

Thompson E, Keshner E, Tucker C, Yu Y, Skrzat J, Snell S, Chudnovskaya I, Lauer R. (2015 February). Balance outcomes and fear of falling in adults with cerebral palsy. Presented at American Physical Therapy Association, Combined Sections Meeting, Indianapolis, IA, USA.

Yu, Y., Keshner, E. A., Tucker, C., Thompson, E. D., & Lauer, R. T. (2015, July). Effect of visual dependence on postural responses to visual perturbation in spastic cerebral palsy. Presented at the 2015 International Society of Postural and Gait Research (ISPGR), Seville, SPAIN.

Yu, Y., Snell, S., Keshner, E. A., & Lauer, R. T. (2015, June). Subtle visual dependent postural reorganization in the virtual environment. Presented at the 2015 International Conference on Virtual Rehabilitation (ICVR), Valencia, SPAIN.

Yu, Y., Keshner, E., Tucker, C., Thompson, E., Lauer, R. Postural responses to visual and somatosensory perturbations in adults with cerebral palsy. 69th annual conference of American Academy for Cerebral Palsy and Developmental Medicine (AACPD), San Diego, CA, USA.

Yu, Y., Keshner, E., Tucker, C., Thompson, E. D., & Lauer, R. T. Postural responses to base of support and visual field in adults with cerebral palsy. International Society for Posture and Gait Research (ISPGR) annual conference meeting, Vancouver, British Columbia, CANADA. June 29-July 3, 2014.

Yu, Y., Maniulit, M., & Lauer, R. Refereed Visual dependence may be related to vestibular hypofunction in cerebral palsy. International Society for Posture and Gait Research (ISPGR) annual conference meeting, Vancouver, British Columbia, CANADA. June 29-July 3, 2014.

Yu, Y., Snell, S., Chudnovskaya, I., Thompson, E. D., & Lauer R. T. Vestibular hypofunction and perspective of balance in adults with cerebral palsy. North American Society for Psychology of Sport and Physical Activity (NASPSA) annual conference, Minneapolis, MN, USA. June 12-14, 2014

Chudnovskaya, I., Snell, S., Miller, R., Yu, Y., & Lauer, R. T. Standing balance in Adults with Cerebral Palsy. Temple University CHPSW Research Day, Philadelphia, PA, USA. May 2014.

Miller, R., Snell, S., Chudnovskaya, I., Yu, Y., & Lauer, R. T. Effect of Visual Dependence on Standing Balance. Temple University Neuroscience Research Day, Philadelphia, PA, USA. May 2014.

Slaboda JC, Lauer RT, Keshner EA. Time series approach to identify responses to visual flow in older adults and adults with stroke. International Society of Posture and Gait Research (ISPGR) XX Conference June 18-22, 2011.

Slaboda JC, Lauer RT, Keshner EA. Postural Responses of Adults with Cerebral Palsy to Combined Base of Support and Visual Field Rotations. ISPGR XX Conference June 18-22, 2011.

Lauer RT, Pierce SR, Tucker CA, Barbe MF, Prosser LA. Electromyographic responses to aging in children with cerebral palsy. 33rd Annual Meeting of the American Society of Biomechanics,

Penn State University, August 2009.

Pierce SR, Prosser LA, Lee SCK, Lauer RT. Relationships between the knee extensors and muscle mass in children with cerebral palsy. 33rd Annual Meeting of the American Society of Biomechanics, Penn State University, August 2009.

Prosser LA, Lee SCK, Barbe MF, VanSant A, Lauer RT. Temporal and frequency characteristics of trunk and hip muscle activity patterns in early walkers with and without cerebral palsy. 33rd Annual Meeting of the American Society of Biomechanics, Penn State University, August 2009.

McRae CGA, Johnston TE, Hunt KJ, Lauer RT. Work Efficiency and Stimulation Cost during FES-cycling by Children with a Spinal Cord Injury. 13th Annual Conference of the International Functional Electrical Stimulation Society (IFESS) October 2008.

Lauer RT, Smith BT, Mulcahey MJ, Betz RR, Johnston TE. Musculoskeletal Effects of Cycling and/or Electrical Stimulation in Children with Spinal Cord. 12th Annual Conference of the International Functional Electrical Stimulation Society (IFESS), Nov. 2007.

Johnston TE, Smith BT, Oladeji O, Betz RR, Mulcahey MJ, Lauer RT. Cardiovascular and Respiratory Effects of FES Cycling in Pediatric SCI. 12th Annual Conference of the International Functional Electrical Stimulation Society (IFESS), Nov. 2007.

Pierce SR, Johnston TE, Oladeji O, Lauer RT. A comparison of the effect of programs of lower extremity cycling and electrical stimulation on spasticity as measured by isokinetic dynamometry in children with spinal cord injury: A preliminary analysis. 12th Annual Conference of the International Functional Electrical Stimulation Society (IFESS), Nov. 2007.

McRae CGA, Lauer RT, Johnston TE, Lee SCK, Smith BT, Hunt KJ, Binder-Macleod SA. FES-cycling Strategies for the Child with a Spinal Cord Injury using Muscle Force-Stimulation Relationships – A Case Study. 12th Annual Conference of the International Functional Electrical Stimulation Society (IFESS), Nov. 2007.

Lauer RT, Stackhouse C, Smith BT, Shewokis PA, Tucker C, McCarthy J. A Frequency-Based Electromyographic Index for Use in Cerebral Palsy. 30th Annual Meeting of the American Society of Biomechanics, Blacksburg VA, Sept. 2006.

Lauer RT, Tucker C, Mulcahey MJ, Dayanidhi S, Stackhouse C, Hutchinson D, Kozin S. Upper Extremity Electromyographic Activity in Response to Biceps to Triceps Transfer Surgery. 30th Annual Meeting of the American Society of Biomechanics, Blacksburg VA, Sept. 2006.

Johnston TE, Lauer RT, Smith B, Betz R. Physiologic Responses to Arm and Leg Ergometry in Pediatric SCI. Proceedings of the 11th Annual Conferences of the International Functional Electrical Stimulation Society (IFESS), 2005.

Lauer R, Shewokis P, Stackhouse C, Pierce S, Smith B, McCarthy J. The Effects of Electrical Stimulation Gait Training in the Child with Cerebral Palsy. 2nd International IEEE Engineering in Medicine and Biology Society Special Topic Conference on Neural Engineering, March 16-19, 2005.

Lauer RT, Smith BT, Betz RR, McCarthy J. An Adaptive Neuro-Fuzzy Control Algorithm for

Electrically Stimulated Gait in the Child with Cerebral Palsy. Proceedings of the 9th Annual Conferences of the International Functional Electrical Stimulation Society (IFESS), July 1-5, 2003.

Lauer RT, Laughton CA, Orlin M, Smith BT. Wavelet Decomposition for the Identification of EMG Activity in the Gait Cycle. Proceedings of the 29th Annual Northeast Bioengineering Conference, 2003.

**Abstracts:**

O'Loughlin A. & Lauer RT. Comparison of Hippotherapy and Vibration Therapy on Gait Parameters in Children with Cerebral Palsy. American Physical Therapy Association's Annual Combined Sections Meeting, Las Vegas, NV. February 2014.

Lauer RT. Balance and Posture in Adults with Cerebral Palsy. Motor Development Research Consortium. Philadelphia, PA, September 2013.

Muth, S., McClure, P., Barbe, M. Lauer, R. Effects of Thoracic Spine Manipulation in Subjects with Signs of Shoulder Impingement. American Physical Therapy Association's Annual Combined Sections Meeting, Chicago, IL. February 2012.

Muth, S., McClure, P., Barbe, M. Lauer, R. Biomechanical and Neuromotor Responses Associated with Thoracic Spine Manipulation in Subjects with Signs of Shoulder Impingement. American Physical Therapy Association's Combined Sections Meeting, Chicago, February 2012.

Muth, S., McClure, P., Barbe, M. Lauer, R. Clinical Outcomes Associated with Thoracic Spine Manipulation in Subjects with Signs of Shoulder Impingement. Annual Pennsylvania Physical Therapy Association Conference, Valley Forge, PA. October 2011.

Muth, S., McClure, P., Barbe, M. Lauer, R. Biomechanical and Neuromotor Responses Associated with Thoracic Spine Manipulation in Subjects with Signs of Shoulder Impingement. Annual Pennsylvania Physical Therapy Association Conference, Valley Forge, PA. October 2011

Johnston TE, Mulcahey MJ, Betz RR, Lauer RT. Effects of Cycling on Bone and Muscle in Pediatric Spinal Cord Injury. American Congress of Rehabilitation Medicine – American Society of Neurorehabilitation (ACRM-ASNR) Annual Conference Atlanta, Georgia October 11–15, 2011.

Johnston TE, Mulcahey MJ, Betz RR, Lauer RT. Effects of Cycling on Bone and Muscle in Pediatric Spinal Cord Injury. International Conference on Spinal Cord Medicine and Rehabilitation in Washington, D.C. June 4-8, 2011

Prosser LA, Lee SCK, Van Sant AF, Barbe MF, Lauer RT. Trunk and hip muscle activity patterns in early walkers with and without cerebral palsy. Combined Sections Meeting of the American Physical Therapy Association, Las Vegas, NV February 2009

Lauer RT, Prosser LA. Teager-Kaiser Energy Operation for Muscle Activity Assessment in Pediatric Gait. Combined Sections Meeting of the American Physical Therapy Association, Las Vegas, NV February 2009.

McRae CGA , Johnston TE, Lauer RT, Tokay AM, Lee SCK, Hunt KJ. A tricycle-based test bed for cycling using electrical stimulation by children with neuromuscular impairments. 62nd Annual Meeting of the American Academy for Cerebral Palsy and Developmental Medicine, 2008.

Johnston TE, Smith BT, Mulcahey MJ, Betz RR, Lauer RT. The Effects of FES Cycling for Children with Spinal Cord Injury. ACRM-ASNR Joint Educational Conference, Toronto Canada, October 2008.

Johnston TE, Smith BT, Betz RR, Lauer RT. The Impact of Cycling and/or Electrical Stimulation on Hip Subluxation in Children with Spinal Cord Injury. Combined Sections Meeting of the American Physical Therapy Association , Nashville TN, February 2008.

Pierce SR, Barbe MF, Barr AE, Shewokis PA, Lauer RT. Co-contraction during passive movements of the knee joint in children with cerebral palsy. Combined Sections Meeting of the American Physical Therapy Association, Nashville, February 2008

Johnston TE, Smith BT, Mulcahey MJ, Betz RR, Lauer RT. Cycling with functional electrical stimulation in pediatric spinal cord injury: a case report. SICI Cycling Science Symposium, Denver, CO, January 2008.

Johnston TE, Lauer RT, Smith BT, Mulcahey MJ, Betz RR. Outcomes of Cycling and/or Electrical Stimulation for Children with Spinal Cord Injury. World Confederation for Physical Therapy International Congress, Vancouver, 2007.

Lauer RT, Johnston TE, Oladeji O, Smith BT, Mulcahey MJ, Betz RR. Musculoskeletal Effects of Cycling and/or Electrical Stimulation in Children with Spinal Cord. The 33rd Annual Meeting” of the American Spinal Injury Association, Tampa 2007.

Johnston TE, Lauer RT, Smith BT, Betz R. Outcomes of Cycling and/or Electrical Stimulation for Children with Spinal Cord Injury. Pediatric Physical Therapy, 2007;19(1):80.

Lauer RT, Johnston TE, Oladeji O, Smith BT, Mulcahey MJ, Betz RR. Musculoskeletal Effects of Cycling and/or Electrical Stimulation in Children with Spinal Cord Injury. The Howard H. Steel Conference: Injuries and Dysfunction of the Spinal Cord in Children, Orlando, Nov/Dec 2006.

Lauer RT, Johnston TE, Smith BT, Mulcahey MJ, Betz RR, Maurer AH. Bone Mineral Density of the Hip and Knee in Children with Spinal Cord Injuries. The Howard H. Steel Conference: Injuries and Dysfunction of the Spinal Cord in Children, Orlando, Nov/Dec 2006.

Johnston TE, Lauer RT, Oladeji O, Smith BT, Mulcahey MJ, Betz RR. Cardiovascular and Respiratory Effects of Cycling and/or Electrical Stimulation in Pediatric SCI. The Howard H. Steel Conference: Injuries and Dysfunction of the Spinal Cord in Children, Orlando, Nov/Dec 2006.

Pierce SR, Johnston TE, Oladeji O, Lauer RT. The effects of programs of lower extremity cycling and electrical stimulation on spasticity as measured by isokinetic dynamometry in children with spinal cord injury. The Howard H. Steel Conference: Injuries and Dysfunction of the Spinal Cord in Children, Orlando, Nov/Dec 2006.

Johnston TE, Lee SCK, Smith BT, Lauer RT, Slater E. Muscle Activation Patterns during



Cycling in Adolescents with and without Cerebral Palsy. *Developmental Medicine and Child Neurology*. 2006;106(48):43.

Johnston TE, Lauer RT, Smith BT, Betz R. Physiologic Responses to Arm and Leg Ergometry in Pediatric SCI. *Developmental Medicine and Child Neurology*. 2006;106(48):35.

Mulcahey MJ, Lauer RT, Johnston TE, Gaughan J, Smith B, Betz R. Comparison of Quality of Life Between Children with Spinal Cord Injury and Their Parents or Guardians. American Paraplegia Society Annual Conference, Las Vegas NV, Sept 2006.

Shewokis PA, Stackhouse CA, Lauer RT, Pierce S, Tucker CA, Smith B, & McCarthy, J. Motor learning principles and FES gait training: The impact on joint coordination and muscle activation in children with cerebral palsy. North American Society for the Psychology of Sport and Physical Activity Association for the 2006 Annual Conference, Denver, CO, June 1-3, 2006

Shewokis PA, Stackhouse CA, Tucker CA, Lauer RT, Pierce S, Smith B, & McCarthy, J. A comparison of gait coordination dynamics in typically developing children and children with cerebral palsy. North American Society for the Psychology of Sport and Physical Activity Association for the 2006 Annual Conference, Denver, CO, June 1-3, 2006

Johnston TE, Lauer RT, Smith BT. Differences in Scores between Children with Spinal Cord Injury and their Parents using the Pediatric Quality of Life Inventory. Combined Sections Meeting of the American Physical Therapy Association , San Diego CA, February 2006.

Pierce SR, Johnston TE, Lauer RT. Examination of spasticity of the knee flexors and knee extensors using isokinetic dynamometry and clinical scales in children with spinal cord injury. Combined Sections Meeting of the American Physical Therapy Association, San Diego CA, February 2006.

Johnston TE, Lauer RT, Smith BT, Maurer AH, Betz RR. Bone Mineral Density in Children with Spinal Cord Injury. Combined Sections Meeting of the American Physical Therapy Association , San Diego CA, February 2006.

Calhoun CL, Chafetz R, Johnston TE, Lauer RT, Mulcahey MJ, Hutchinson D, Smith B; Betz R. Clinical and Research Activity Based Rehabilitation for Children with Spinal Cord Injury. 59th Annual Meeting of the American Academy for Cerebral Palsy and Developmental Medicine, 2005.

Johnston TE, Lauer RT, Smith B, Betz R. Physiologic Responses to Arm and Leg Ergometry in Pediatric SCI. 59th Annual Meeting of the American Academy for Cerebral Palsy and Developmental Medicine, 2005.

Johnston TE, Lauer RT, Smith B, Betz R. Physiologic Responses to Arm and Leg Ergometry in Pediatric SCI. 51st Annual Conference of the American Paraplegia Society, 2005.

Shewokis PA, Lauer RT, Stackhouse C, Pierce S, Smith B, McCarthy J. The long-term effects of practice and FES gait training on joint coordination and muscle activation in a child with cerebral palsy. NASPSPA Annual Conference, June 9 -11, 2005.

Shewokis PA, Stackhouse C, Lauer RT, Pierce S, Smith B, McCarthy J. Application of motor learning principles and FES gait training on joint coordination and muscle activation in children

with cerebral palsy. NASPSPA Annual Conference, June 9 -11, 2005.

Stackhouse CA, Lauer RT, Shewokis PA, Smith BT, McCarthy JJ. Changes in Muscle Activity Following Hamstring Lengthening Surgery. Annual Meeting of the Gait and Clinical Movement Analysis Society, April 2005.

Pierce SR, Lauer RT, Orlin MN, Rubertone J. The role of reflex activity, passive resistance, and co-contraction during the assessment of spasticity of the knee flexors and knee extensors in children with cerebral palsy. Combined Sections Meeting of the American Physical Therapy Association, New Orleans Louisiana, February 2005.

Johnston TE, Lauer RT, Smith B, Betz R. Physiologic Responses to Arm and Leg Ergometry in Pediatric SCI. 51st Annual Conference of the American Paraplegia Society, 2005.

Pierce SR, Lauer RT, Orlin MN, Rubertone J. The role of reflex activity, passive resistance, and co-contraction during the assessment of spasticity of the knee flexors and knee extensors in children with cerebral palsy. Combined Sections Meeting of the American Physical Therapy Association, New Orleans Louisiana, February 2005.

Lauer R, Stackhouse, C, Smith B, Orlin M, Shewokis P, McCarthy J. Wavelet Analysis of Gait in Children with Typical Development and Cerebral Palsy. BMES Annual Fall Meeting, Philadelphia, PA, October 14-17, 2004.

Shewokis PA, Lauer, RT, Pierce S, Stackhouse CA, Smith BT, McCarthy JJ. The Effects of Functional Electrical Stimulation Gait Training on Joint Coordination and Muscle Activation in the Child with Cerebral Palsy. XVth Congress of the International Society of Electrophysiology & Kinesiology, June 18-21, 2004.

Lauer RT, Stackhouse CA, Smith BT, Orlin M, Pierce S , McCarthy JJ . Initial Feasibility of Wavelet Analysis of Gait in Children with Cerebral Palsy. XVth Congress of the International Society of Electrophysiology & Kinesiology, June 18-21, 2004.

Pierce SR, Orlin MN, Lauer RT, Johnston TE, Smith BT, McCarthy JJ. Comparison of percutaneous and surface functional electrical stimulation during gait in a child with hemiplegic cerebral palsy. Combined Sections Meeting of the American Physical Therapy Association, Nashville, Tennessee, 2004.

Lauer RT, Smith BT, Betz RR, McCarthy J. Comparison of Electromyographic (EMG) Mean Frequency during Gait between Children with and without Cerebral Palsy. NIH Trainee Workshop, December 9-10, 2003.

Lauer RT, Smith BT, Betz RR, McCarthy J. Comparison of Electromyographic (EMG) Mean Frequency during Gait between Children with and without Cerebral Palsy. Dev Med & Child Neuro, 45 (Suppl 96), 45-46, 2003.

### **Non-Peer Reviewed Publications:**

Cerebral Palsy International Research Foundation Fact Sheet, August 2009, The Effect of

Botulinum Toxin on Neuromuscular Plasticity in the Child with Cerebral Palsy”  
<http://cpirf.org/stories/686>

Cerebral Palsy International Research Foundation Fact Sheet, July 2009, “Functional Electrical Stimulation as a Means to Retrain the Brain” <http://cpirf.org/stories/505>

Scientific American Frontiers “The Bionic Body – Mind over Matter” Air Date March 27, 2001  
<http://www.pbs.org/saf/1107/segments/1107-5.htm>

ABC Nightly News, Air Date February 14, 2001

MIT Technology Review “Mind Over Muscles” March/April 2000, pp. 39-45  
[http://www.relaxtv.com/mind\\_over\\_muscles.htm](http://www.relaxtv.com/mind_over_muscles.htm)

### **Non-Peer Reviewed Presentations:**

Lauer RT. The Question of Cerebral Palsy. University of Maryland, School of Kinesiology, June 18, 2012.

Lauer RT. Age Related Changes in the Adult with Cerebral Palsy. Hospital for Special Surgery, New York, January 6, 2011

Lauer RT. Functional Electrical Stimulation in Pediatrics. State of the Science Workshop on Pediatric Rehabilitation Engineering. October 16-17, 2008.

Lee SCK, Lauer RT. Functional Electrical Stimulation: Treating Children and Adults with CP through the Lifespan. Transformational Technologies in Single-Event Neurological Conditions: Applying lessons learned in Stroke to Cerebral Palsy, August 14-15, 2008.

Lauer RT, Tucker CA. Advanced Analysis of Electromyographic Data. Annual Meeting of the Gait and Clinical Movement Analysis Society, April 2-5 2008.

Lauer RT. Research at Shriners Hospitals, Philadelphia. Drexel University, School of Biomedical Engineering, Science and Health Systems, September 26, 2003.

Smith BT, Benda BJ, Lauer RT. Functional Electrical Stimulation Research at Shriners Hospitals, Philadelphia. Drexel University, School of Biomedical Engineering, Science and Health Systems, April 25, 2003.

### **Funded/In Review Grant Activity:**

2012-2016                      Principal Investigator  
Balance and Posture in Adults with Cerebral Palsy  
R01HD069769- NIH, NICHD  
Direct Costs: \$830,000

### **Current/Active Research Activity:**

R. Lauer, C. Tucker, EA Keshner: Balance and Posture in Adults with Cerebral Palsy.  
NIH funded

### **Membership in Scientific/Professional Organizations:**

Member, American Academy of Cerebral Palsy and Developmental Medicine	2011-present
Member, American Society of Biomechanics	2008-present
Member, IEEE/ Engineering in Medicine and Biology Society	2002-present
Member, Institute of Electrical and Electronics Engineers (IEEE)	2002-present
Member, International Functional Electrical Stimulation Society (IFESS)	1997-present
Member, American Society of Mechanical Engineers	2008-2011
Member, International Society of Biomechanics	2007-2012
Member, International Society of Electromyography and Kinesiology (ISEK)	2004-2008
Member, IEEE/ Neural Networks Society	2002-2008

### **Consultative and Advisory Positions Held:**

#### **Editorial Board**

- Advances in Electrical Engineering 2013-present

#### **Manuscript Reviewer**

- Journal of Electromyography & Kinesiology 2011-present
- IEEE Transactions on Neural Systems & Rehabilitation Engineering 2008 -present
- Pediatric Physical Therapy 2008-present
- Gait & Posture 2008-present
- Annals of Biomedical Engineering 2008-present
- Computers in Biology and Medicine 2008-present
- Journal of Applied Biomechanics 2007- present
- Neuromodulation 2006 - present
- Medical Engineering & Physics 2006 - present
- Journal of Biomechanics 2005 - present
- IEEE Transactions on Biomedical Engineering 2004 - present
- American Journal of Physical Medicine & Rehabilitation 2004 - present
- Journal of Neuroengineering and Rehabilitation 2004 - present
- Journal of Rehabilitation Research & Development 2002 - present
- Medical & Biological Engineering & Computing 2002 - present

#### **Grant Reviewer**

- Thrasher Research Fund, ad-hoc 2006-present
- U.S. Civilian Research & Development Foundation, ad-hoc 2007-present
- Cerebral Palsy International Research Foundation, ad-hoc 2010-present
- Oak Ridge Associated Universities International program, ad-hoc 2013-present
- Department of Defense, Clinical and Rehabilitative Medicine Research Program, Hearing and Balance-2 Committee, member 2014

### **Community Service:**

Vestry member, St. Peter's Episcopal Church, Glenside PA 2013 - present

### **Services to the University/College/School on Committees/Councils/Commissions:**

#### **University Service**

- Faculty Advisor, CP Student Organization 2012-present
- Interdisciplinary Faculty Council on Disabilities Studies 2012-present
- Judge, College of Health Professions and Social Work Research Day 2009-present
- Judge, College of Engineering Research Day 2009
- Interviewer, Selection committee for the Chair of Biomedical Engineering Temple University 2009
- Junior Faculty representative, Middle States Commission on Higher Education reaccreditation meeting 2010

College Committees

- Chair of Committee (Temple University)
- Research and Study Leave Committee 2011-2012
- Committee Member(Temple University)
- Research Day Committee 2009-present
  - Graduate Council 2009-2011
  - Research and Study Leave Committee 2009-2011
  - Tenure Track Faculty Search Committee 2012  
Health Information Management

Departmental Committees

- Chair of Committee
- Physical Therapy Tenure-Track Faculty Search Committee 2012,2013
- Committee Member
- Promotion and Tenure Committee 2014-present
  - PhD Committee 2008-present
  - Technical Development Committee 2008-present
  - Professional Development Committee 2009-2014

Honors and Awards:

- Temple Merit Award 2010-2013
- Overseas Fellow, Royal Society of Medicine, 2008
- Senior Member, Institute of Electrical and Electronics Engineers (IEEE) 2007

Continuing Education Attended: N/A

Current Teaching Responsibilities in the Entry-Level Program:

*Spring Semester*

- PTH 8523 Movement Science II
- PTH 8525 Clinical Electrophysiology Course Director

*Fall Semester*

- PTH 8513 Movement Science I Course Director
- PTH 8555 Assistive Technologies Course Director