

Carolynn Patten, Ph.D., PT

Curriculum Vitae

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Education

Stanford University

School of Medicine, Department of Functional Restoration
Rehabilitation Research & Development Center, VA Palo Alto Health Care System
Post-Doctoral Fellow, 1998 - 2001
Career Development Award: Motor Unit Firing Patterns in Post-stroke Hemiparesis

University of Massachusetts - Amherst

School of Public Health & Health Sciences, Department of Kinesiology
Doctor of Philosophy, 1998
Dissertation: Adaptations in Human Motor Unit Control Properties: Influences of Aging and Training

Boston University

Sargent College of Rehabilitation Sciences, Department of Physical Therapy
Master of Science, Physical Therapy, 1992
Research Option: Use of Accelerometry to Measure Postural Sway

University of Washington

Department of Kinesiology
Bachelor of Arts, 1980
Undergraduate Research: Developmental Effects on Reaction Time Sequencing

Grants & Awards

Submitted & Pending

Rehabilitation Research and Development, Department of Veterans Affairs

Revised Application submitted June 15, 2010
Research Career Scientist Award
Principal Investigator (5 year award, salary + fringe)

University of Florida Claude D. Pepper Older Americans Independence Center, Pilot Grant

Submitted May 24, 2010, pending review
Locomotor Reserve: A Novel Approach for Detecting Mobility Deficits with Aging
Co-Investigator (\$130,000 - direct costs, 2 year proposal)

National Institutes of Health, R01

Submitted February 5, 2010, (to be resubmitted October, 2010)
Bilateral Mechanisms of Hemiparetic Locomotion
Principal Investigator (\$1,250,000 - direct costs, 5 year proposal)

Rehabilitation Research and Development, Department of Veterans Affairs

Application submitted December 10, 2009, Merit Review (to be resubmitted December, 2010)
Neural and Biomechanical Determinants of Bilateral Locomotor Control Post-stroke
Principal Investigator - \$1,100,000 Direct Costs (4.0 year proposal)

Awarded, Active

James and Esther King Biomedical Research Program, Florida Department of Health

July 1, 2009 - June 30, 2012
Use of Repetitive Transcranial Magnetic Stimulation to Enhance Post-stroke Recovery
Co-Investigator (PI: Dorian K. Rose, Ph.D., PT - \$375,000 total costs)

Rehabilitation Research and Development, Department of Veterans Affairs

May, 2008, Large equipment grants
Principal Investigator - \$111,185

Rehabilitation Research and Development, Department of Veterans Affairs

August 1, 2008 - September 30, 2011, Merit Review
Developing Evidence-based Parameter Selection for Locomotor Training
Co-Principal Investigator w/Steven A. Kautz, Ph.D. - \$675,000, Direct Costs (3 year proposal)

Rehabilitation Research and Development, Department of Veterans Affairs

April, 2008, Small equipment grants

Principal Investigator - \$117,147
Rehabilitation Research and Development, Department of Veterans Affairs
July 1, 2009 – September 30, 2011, Merit Review Pilot Grant
Neuromuscular Adaptations to UE Resistance Training Post-stroke
Principal Investigator - \$50,000, Direct Costs

Rehabilitation Research and Development, Department of Veterans Affairs
August 2005 – September 2011, Merit Review
Mechanisms of Upper Extremity Recovery in Post-stroke Hemiparesis
Principal Investigator - \$1,000,000, Direct costs

Rehabilitation Research and Development, Department of Veterans Affairs
August 2005 – August 30, 2010, Pilot initiative on Body Weight Supported Treadmill Training Internally v. Externally-driven BWSIT for Locomotor Recovery Post-stroke
Principal Investigator - \$450,000, Direct costs

Awarded, Completed

National Institute for Diabetes and Digestive and Kidney Diseases, NIH
September 2007 – August 2009
Testosterone Replacement Therapy in Advanced Chronic Kidney Disease
Co-Investigator (PI – Ralph Rabkin, MD - \$275,000, Direct costs)

National Institute for Biomedical Engineering, NIH
January 1, 2006 – December 31, 2010, R01
EMG-based Estimation of Muscle Structure and Function
Co-Investigator (PI – Kevin McGill, Ph.D. - \$1,000,000, Direct costs)

National Institute of Aging, NIH
June 2005 – May 2009, R01
Lower extremity muscle power and function in the elderly
Co-Investigator (PI - Roger Fielding, Ph.D. - \$2,072,482, Direct costs)

Rehabilitation Research and Development, Department of Veterans Affairs
Summer 2003, Clinical Trial Planning Grant
Effects of Locomotor Training in Post-stroke Hemiplegia
Principal Investigator - \$200,000, Direct costs

Rehabilitation Research and Development, Department of Veterans Affairs
April 1, 2003 – March 30, 2006, Merit Review Grant
Therapeutic Effects on Neuromuscular Function in Post-stroke Hemiplegia
Principal Investigator – \$800,000, Direct costs

Rehabilitation Research and Development, Department of Veterans Affairs
February 2001- February 2004, Advanced Research Career Development Award
Motor-Unit Firing Patterns in Hemiplegia
Principal Investigator – \$300,000, Direct costs
mentors: Felix E. Zajac, III, Ph.D. & Kevin C. McGill, Ph.D.

Rehabilitation Research and Development, Department of Veterans Affairs
January, 2001 – December, 2003, Merit Review Grant
Effects of Strength Training on Upper-limb Function in Post-stroke Hemiparesis
Principal Investigator – \$414,700, Direct costs

National Center for Medical Rehabilitation Research, NIH
June 2000 – May 2004, R01
Bilateral Coordination of Hemiparetic Locomotion
Co-Investigator (PI- Steven A. Kautz, Ph.D. - \$869,443, direct costs)

National Institute of Neurological & Communicative Disorders and Stroke, NIH
January 2000 – December 2002, R01
Intermuscular Coordination of Mammalian Movement
Co-Investigator (PI - Felix E. Zajac, III, Ph.D. - \$724,947 direct costs)

VA VISN 21 Research Council
January, 2000 – December, 2000 Young Investigator Award

Comparison of Computer-Aided EMG Analysis Tools

Principal Investigator, \$5,000, Direct costs

Foundation for Physical Therapy

1998-2000, New Investigator Fellowship and Training Initiative

Motor Unit Discharge and Control of Functional Movement in Hemiplegia

Principal Investigator - \$60,000, Direct costs

Rehabilitation Research and Development, Department of Veterans Affairs

1998-2001, Research Career Development Award

Motor-Unit Firing Patterns in Hemiplegia

Principal Investigator - \$ 275,000, Direct costs

mentors: Felix E. Zajac, III, Ph.D. & Kevin C. McGill, Ph.D.

Foundation for Physical Therapy

1994-97, Doctoral Research Awards:

Neural and Structural Motor Unit Contributions to Muscular Force in Older Adults

Principal Investigator, \$15,000 per year

Dudley Allen Sargent Research Fund (Boston University)

1992, Grant Recipient:

Use of Accelerometry to Measure Postural Sway

Principal Investigator, \$1900

Scholarly Activity

Peer-Reviewed Articles

1. Phadke C.P.*, Condliffe E.G.*, Robertson C.T.*, **Patten C.** Inter-limb differences and test-retest reliability of flexor carpi radialis H-reflex measurement post-stroke. *Submitted, Clinical Neurophysiology.*
2. Naik, S.*, **Patten, C.**, Lodha, N., Coombes, S.A., Cauraugh, J.H. Force control deficits in chronic stroke: Grip formation and release phases. *Submitted, Experimental Brain Research.*
3. Reid K.R., Doros, G., Clark D.J.*, **Patten C.**, Carabello R.J., Cloutier G., Phillips E.M., Krivickas L., Frontera W., Fielding R.A. Muscle power failure in mobility-limited older adults: preserved single fiber function despite lower whole muscle size, quality and neuromuscular activation. *In revision for, J. Applied Physiology.*
4. Corti M.*, McGuirk T.E., Wu, S.S., **Patten C.** Recovery of Upper Extremity Motor Function Post-stroke: Differential Effects of Two Therapeutic Interventions. *In revision for, Neurorehabilitation and Neural Repair.*
5. **Patten C.**, Condliffe E.G.*, and Lum P.S. Dynamic Resistance Training Post-stroke II: Concurrent Improvements in Elbow Stretch Reflex Modulation and Upper-Extremity Functional Use. *Accepted w/minor revisions, Physical Therapy.*
6. **Patten C.**, Condliffe E.G.*, Dairaghi C.A., Lum P.S. Dynamic Resistance Training Post-stroke I: Upper-extremity functional gains. *Accepted w/minor revisions, Physical Therapy.*
7. Clark D.J.*, **Patten C.**, Reid K.R., Carabello R.J., Phillips E.M., Fielding R.A. Slow rate of neuromuscular activation impairs limb acceleration and power in mobility-limited older men and women. *Accepted, Journal of Gerontology A: Biological and Medical Sciences.*
8. Clark D.J.*, **Patten, C.**, Reid, K.R., Fielding, R.A., Velocity-dependent modulation of agonist activation preserves dynamic torque. *Journal of Gerontology A: Biological and Medical Sciences, 65(5):495-502, 2010. PMID: 20156882*
9. DeGroot F., Pipeleers G., Jonkers, I.* Demeulenaere, **Patten C.**, Swevers J., De Schutter J. A physiology based inverse dynamic analysis of human gait: potential and perspectives. *Computer Methods in Biomechanics and Biomedical Engineering, 12(5): 563-74, 2009. PMID: 19319704*
10. **Patten C.**, Gonzalez-Rothi EJ*, Little VL*, Kautz SA. Invited commentary on: Allowing intralimb kinematic variability during locomotor training poststroke improves kinematic consistency: a subgroup analysis from a randomized clinical trial. *Physical Therapy, 2009; 89(8): e1-2. PMID: 19648104*
11. Westlake K.P.*, **Patten C.** Pilot Study of Robot versus Manual-Assisted Treadmill Training for Locomotor Recovery Post-Stroke. *Journal of Neuroengineering and Rehabilitation, 6(18), June, 2009. PMID: 19523207*
12. Jonkers I.*, Delp S.L., **Patten, C.** Capacity to increase walking speed is limited by impaired hip and ankle power generation in lower functioning persons post-stroke. *Gait & Posture, 29(1): 129-37, 2009. PMID: 18789692*
13. Pak, S.S.*, **Patten, C.** Strengthening to Promote Functional Recovery Post-stroke: An evidence-based Review. *Topics in Stroke Rehabilitation, 15(3): 177-199, 2008. PMID: 18647724*

14. Wagner J.M.*, Rhodes J.A.*, **Patten C.** Reproducibility and minimal detectable change of three-dimensional kinematic analyses of forward reaching tasks in person with post-stroke hemiparesis. *Physical Therapy*, 88(5): 652-63, 2008. PMID: 18326055
15. Chen G.*, **Patten C.** Joint moment work during the stance-to-swing transition in hemiparetic subjects. *Journal of Biomechanics*: 41(4): 877-83, 2008. PMID: 18067898
16. Chen, G.* & Patten, C., Treadmill Training with Harness Support: Selection of training parameters for individuals with post-stroke hemiparesis. *J. Rehabilitation R&D*, 43(4): 485-498, 2006. PMID: 17123188
17. Clark, D.J.*, Condliffe, E.G.*, **Patten, C.,** Activation impairment alters muscle torque-velocity in post-stroke hemiparesis. *Clinical Neurophysiology*, 117(10): 2328-2337, October 2006. PMID: 16926111
18. **Patten, C.,** Dozono, J.M., Jue, M.E., Schmidt, S.G., Lum, P.S. Its Not About the Muscle! Response to invited commentary. *Journal of Neurologic Physical Therapy*, 30(3): 118-119, 2006. PMID: 17076032
19. **Patten, C.,** Dozono, J.M., Jue, M.E., Schmidt, S.G., Lum, P.S. Combined Functional Motor Retraining and Dynamic High Intensity Resistance Training Promotes Recovery of Upper-extremity Motor Recovery in Post-stroke Hemiparesis. *Journal of Neurologic Physical Therapy*, 30(3): 99-115, 2006. PMID: 17029654
20. Kautz, S.A., **Patten, C.,** Neptune, R. Does Unilateral Pedaling Activate a Rhythmic Locomotor Pattern in the Non-pedaling Leg in Post-stroke Hemiparesis? *Journal of Neurophysiology*, 95(5): 3154-63, 2006. PMID: 16452259
21. Clark, D.J.*, Condliffe, E.G.*, **Patten, C.** Reliability of Concentric and Eccentric Torque During Isokinetic Knee Extension in Post-stroke Hemiparesis. *Clinical Biomechanics*, 21(4): 395-404, 2006. PMID: 16403594
22. Chen, G., **Patten, C.,** Kothari, D. and Zajac, F.E. Gait deviations associated with post-stroke hemiparesis: Improvement during treadmill walking using weight support, speed, support stiffness, and handrail hold. *Gait and Posture*, 22(1): 57-62, 2005. PMID: 15996593
23. Chen, G., **Patten, C.,** Kothari, D. and Zajac, F.E. Gait differences between individuals with post-stroke hemiparesis and non-disabled controls at matched speeds. *Gait and Posture*, 22(1): 51-56, 2005. PMID: 15996592
24. Condliffe E.G.*, Clark, D.J.*, **Patten C.** Reliability of Elbow Stretch Reflex Assessment in Chronic Post-stroke Hemiparesis, *Clinical Neurophysiology*, 116(8): 1870-1878, 2005. PMID: 15979400
25. Kautz, S.A., **Patten C.** Interlimb Influences on Paretic Leg Function in Post-stroke Hemiparesis. *Journal of Neurophysiology*, 93(5): 2460-73, 2005. PMID: 15590727
26. Flansbjerg, U-B., Holmback, A.M., Downham, D., **Patten, C. ,** Lexell, J. Reliability of Gait Performance Tests in Men and Women with Hemiparesis After Stroke. *Journal of Rehabilitation Medicine*, 37: 75-82, 2005. PMID: 15788341
27. Kim, C.M.*, Kothari, D.H., Lum, P.S., **Patten, C.** Reliability of Dynamic Muscle Performance in the Hemiparetic Upper-Limb. *Journal of Neurologic Physical Therapy*, 29(1): 9-17, 2005. PMID: 16386156
28. Lum PS, **Patten C,** Kothari D, Yap R. Effects of velocity and angle on elbow torque during isokinetic strength testing in post-stroke hemiparesis. *Muscle & Nerve*, 30: 732-42, 2004. PMID: 15468340
29. **Patten, C.,** Lexell, J., Brown, H.E.. Strength training in persons with post-stroke hemiplegia: Rationale, Method, and Efficacy. *Journal of Rehabilitation R&D*, 41(3A): 293-312, 2004. PMID: 15543447
30. **Patten, C.,** Meyer, R.A. & Fleckenstein, J.L. T2 Mapping of Muscle *Dynamic and Functional Musculoskeletal Imaging-Seminars in Musculoskeletal Radiology*, Vol 7, No 4: 297-305, 2003. PMID: 14735428
31. **Patten, C.,** Kothari, D., Whitney, J.A.*, Lexell, J. & Lum, P.S. Reliability and Responsiveness of Elbow Trajectory-tracking in Chronic Post-stroke Hemiparesis. *J. Rehabilitation R&D*, 40(6): 487-500, 2003. PMID: 15077661
32. **Patten, C.,** Horak, F.B. Krebs, D.E. Head & Body Center of Gravity Control Strategies: Adaptations Following Vestibular Rehabilitation. *Acta Oto-laryngologica*, 123(1): 32-40, 2003. PMID: 12625570
33. **Patten, C.,** Kamen, G., Rowland, D.M. Adaptations in Maximal Motor Unit Discharge Rate Following Strength Training in Young and Older Adults. *Muscle & Nerve*, 24: 542-550, 2001. PMID: 11268027
34. **Patten, C.,** Kamen G. Adaptations in Motor Unit Discharge Activity with Force Control Training in Young and Older Adults. *European Journal of Applied Physiology*, 83, 128-143, 2000. PMID: 11104053
35. **Patten, C.** Reeducating Force Control in Older Persons Through Strength Training. *Topics in Geriatric Rehabilitation*, 15(3), 47-59, 2000.
36. Leong, B., Kamen, G., **Patten, C. & Burke, J.R.** Maximal motor unit discharge rates in the quadriceps muscles of older weightlifters. *Medicine and Science in Sports and Exercise*, 31(11), 1638-1644, 1999. PMID: 10589869
37. Kamen, G., **Patten, C.,** Du, C.C., and Certo, C.M.E. An Accelerometry-based system for the assessment of balance and postural sway. *Gerontology*, 44: 40-45, 1998. PMID: 9436014

38. Kamen, G., Sison, S.V., Du, C.C., **Patten, C.** Motor Unit Discharge Rates During Maximal Effort in Older Adults, *Journal of Applied Physiology*, 79:1908-1913, 1995. *PMCID: 8847252*
39. **Patten, C.**, Hillel, A.D. The Eleventh Nerve Syndrome: Accessory Nerve Palsy or Adhesive Capsulitis? *Archives of Otolaryngology/Head and Neck Surgery* (119), February 1993. *PMCID: 8427686*
- (name denotes student or fellow as first author, name* denotes student or fellow supervised by C. Patten)

Manuscripts in Preparation (data collection complete)

- Naik S.*, **Patten, C.**, Lodha, N., Coombes, S.A., Cauraugh, J.H. Force control deficits in chronic stroke: grip formation and release phases, *in preparation for Clinical Neurophysiology*.
- Jonkers I.*, Delp S.L., **Patten C.** Comparison of muscle activation patterns of hemiparetic and non-disabled persons walking at matched speeds. *in preparation for Gait & Posture*.
- Lum, P.S., **Patten, C.** Gains in Torque Generation and EMG Activation following Dynamic Resistance Training Post-stroke. *in preparation for Muscle & Nerve*.
- Patten, C.**, McGill, K.C., Motor Unit Firing Patterns in Post-Stroke Hemiplegia. *in preparation for Clinical Neurophysiology*

By Editorial Invitation

Book Chapters

- Patten, C.**, Little, V.L.* & Marcoux, K.L.* Robotics for Stroke Recovery. *In Neurorehabilitation Technology*, Dietz V., Rymer W.Z., & Nef T., Editors. Springer, *in preparation*.
- Patten, C.** & Gregory, C.M.* Principles of Exercise. *In Neurologic Physical Therapy*, Sullivan KS, Editor. F.A. Davis, *in preparation*.
- Patten, C.** & Craik, R.L. Sensorimotor changes and Adaptation in the Older Adult. *In Geriatric Physical Therapy*, 2nd Edition, Guccione, A.A., Editor. Mosby-Year Book, 2000.
- Patten, C.**, Steindorf, S. Principles of Physical Therapy. *In Outpatient Medicine*, S. Fihn and S. McGee, Editors. W.B. Saunders & Co., 1992.

Monographs

- Hillel, A.D., **Patten, C.** Neck Dissection: Morbidity and Rehabilitation, in *Head and Neck Oncology*, Third Edition, Charlotte Jacobs, Editor. Kluwer Academic Publishers, 1989.
- Patten, C.** Motor Unit Firing Patterns and Age-related Changes. PROCID Symposium on Muscular Disorders in computer users: mechanisms and models. Copenhagen, 1999, pp 84-89.

Book Reviews

- Patten, C.** Review of *Clinical Applications in Surface Electromyography*, *Physical Therapy*.
- Patten, C.** Review of *Sedentary Life and Nutrition*, *Topics in Geriatric Rehabilitation* 8(4), June 1993.

Published Abstracts

1. **Patten, C.**, McGuirk, T.E., Robertson, C.T.*, Gonzalez-Rothi, E.J.*, Little, V.L.* A quantitative EMG approach to identify subject-specific parameters of enhanced bilateral locomotor output post-stroke. Society for Neural Control of Movement, April, 2010.
2. Patil, S.*, Jonkers, I.*, **Patten, C.** Therapeutically-induced improvements in stance phase muscle coordination post-stroke. Society for Neural Control of Movement, April, 2010.
3. Little, V.L.*, McGuirk, T.E., Gonzalez-Rothi, E.J.*, Westlake, KP*, **Patten, C.** More is not always better. Adaptations in muscle activation patterns during overground gait following locomotor training. Society for Neural Control of Movement, April, 2010.
4. Gonzalez-Rothi, E.J.*, McGuirk, T.E., Little, V.L.*, Robertson, C.T.*, **Patten, C.** Externally-Driven Biomechanically Coordinated Stepping with Asymmetrical Guidance Enhances Bilateral Motor Output Post-stroke. Society for Neural Control of Movement, April, 2010.
5. Robertson CT*, Little VL*, Gonzalez-Rothi EJ* and **Patten C.** External Biomechanical Control of Locomotion Normalizes the Bilateral Sensorimotor State Post-stroke. Society for Neural Control of Movement, April, 2010.
6. Corti, M.*, **Patten, C.** Differential adaptations in elbow stretch reflex modulation in persons post-stroke. Society for Neural Control of Movement, April, 2010.
7. Little, VL*, Gonzalez-Rothi, EJ*, McGuirk TE, Westlake, KP*, **Patten, C.** Joint Kinetics Adapt Bilaterally Following Locomotor Training Post-stroke. *J Neurologic Physical Therapy*, 33(4): 234, 2009.
8. Patil, S.*, Jonkers, I.*, **Patten, C.** Unilateral paretic limb power training produces bilateral locomotor effects post-stroke. *J Neurologic Physical Therapy*, 33(4): 234, 2009.

9. Gonzalez-Rothi, EJ*, Little, VL*, McGuirk, TE, Jaramillo, J, **Patten, C.** Neuromechanical adaptations following locomotor training post-stroke. *J Neurologic Physical Therapy*, 33(4): 235, 2009.
10. Corti, M.*, **Patten, C.** Power training improves stretch reflex modulation in persons post-stroke. *J Neurologic Physical Therapy*, 33(4): 235, 2009
11. Gonzalez-Rothi, EJ*, Little, VL*, McGuirk, TE, Jaramillo, J, **Patten, C.** Walking-related outcomes following locomotor training post-stroke. *Gait & Posture*, 30 (Suppl 2): S130, 2009.
12. Little, V.L.*, Gonzalez-Rothi, E.J.*, McGuirk, T.E., Westlake, K.P.*, **Patten, C.** Gait adaptations following locomotor training post-stroke. *European Society for Movement Analysis in Adults and Children (ESMAC)*. London, UK, September, 2009.
13. **Patten, C**, Corti, M*, McGuirk, TE. Improved coordination of reach-to-grasp post-stroke: learning the movement vs. changing the strategy. *Int'l Society for Posture and Gait Research*, Bologna, Italy, June, 2009.
14. Corti, M.*, McGuirk, TE, **Patten, C.** Differential adaptations in reaching control post-stroke: movement execution vs. coordination. *Int'l Society for Posture and Gait Research*, Bologna, Italy, June, 2009.
15. Gregory, CM, Bowden, MG, **Patten, C**, Vandeborn, KE, Kautz, SA. Improved metabolic efficiency post-stroke is associated with increased walking velocities. *American Physical Therapy Association-Combined Sections Meeting*, Las Vegas, NV, 2009.
16. Westlake, KP*, **Patten, C.** Comparative Study of Two Motor Learning Approaches to Restoration of Locomotion Post-Stroke, *Society for Neuroscience Abstracts*, 2008.
17. Corti, M.*, McGuirk, TE, **Patten, C.** Differential effects on kinematics of free reaching after functional task practice and dynamic resistance training in low functioning persons post-stroke. *2nd Summer School on Advanced Technologies for Neuro-motor Assessment and Rehabilitation. STARTER: Strategic Network for Assistive & Rehabilitation Technology in Emilia-Romagna*, Bologna, Italy, July 2008
18. **Patten, C**, Patil, S*, Jonkers, I*. Gait speed modulation in post-stroke hemiparesis. *Neural Control of Movement Society*, Naples, FL, May, 2008.
19. Clark, DJ*, **Patten, C**, Reid, KF, Carabello RJ, Phillips EM and Fielding RA. Slow rate of neuromuscular activation contributes to impaired movement acceleration and peak power in mobility-limited older adults. *Experimental Biology*, San Diego CA, April 2008.
20. Veeraraghavan, K*, Wagner, JM*, **Patten C.** Differential effects of treatment outcomes based on chronicity of stroke and severity of upper extremity motor impairment. *APTA Combined Sections Meeting*, abstracted in *J Neurologic Physical Therapy*, 31(4): 191, 2007.
21. Rhodes JA*, **Patten, C**, Wagner, JM*. Reliability and responsiveness of three-dimensional kinematic analysis of forward reach tasks in adults with post-stroke hemiparesis. *APTA Combined Sections Meeting*, abstracted in *J Neurologic Physical Therapy*, 31(4): 210, 2007.
22. Jonkers I*, Delp SL, **Patten C.** To what extent does walking speed influence the interpretation of gait analysis data in hemiparetic gait? *16th Annual Meeting of ESMAC (European Society for Motion Analysis in Adults and Children)*, Athens, Greece, *Gait and Posture*, 26S: S3, 2007.
23. Chen G.*, **Patten, C.** Joint moment work during the stance-to-swing transition in hemiparetic subjects. *International Society for Posture & Gait Research*, July, 2007. Abstracted in *Gait & Posture*, July, 2007.
24. **Patten, C.**, Jaramillo, J.P., Grogan, A.P., Teraoka, J.K. and Chen, G. Locomotor Training Speed Influences Lower Extremity Motor Activation in Clinically Motor Complete Spinal Cord Injury. *International Society for Posture & Gait Research*, July, 2007.
25. Jonkers, I.*, Delp, S.L., **Patten, C.** Gait Speed Modulation is limited by impaired hip and ankle power generation in lower functioning persons post-stroke. *Int'l Society for Posture & Gait Research*, July, 2007.
26. Kautz, S.A., **Patten, C.**, Neptune, R.R., Worthen, L.C., Kim, C.M. The influence of mechanical load on the locomotor pattern in persons with post-stroke hemiparesis. *International Society for Posture and Gait Research*, July, 2007.
27. Clark D.J.*, **Patten, C.**, Fielding R.A. Does force or velocity contribute more to maximal power in older adults? *American College of Sports Medicine*, May, 2007. Abstracted in: *Med Sci Sports Ex*, May, 2007
28. **Patten C**, Dozono JM, Jonkers I.* Gait Speed Improves Significantly Following Dynamic, High-Intensity Resistance Training in Persons Post-stroke. *International Stroke Conference*, San Francisco, CA February, 2007, *Stroke*, 38(2): 465, 2007.
29. Jonkers I*, Liu M, Arnold A, Thelen D, Anderson FC, **Patten C**, Delp SL. Factors that Impede Forward Progression during Hemiparetic Gait: A Simulation-Based Case Study *World Congress of Biomechanics*, Germany, July 2006.
30. Clark DJ*, Condliffe E*, **Patten, C.** Activation impairment alters muscle torque-velocity in post-stroke hemiparesis. *Society for Neuroscience Abstracts*, 2005.

31. Jonkers I.*, **Patten C.**, Arnold A., Delp S. Is the reflex threshold during the pendulum test related to the onset of vastus excitation during hemiparetic gait? *Gait & Posture*, 22S: S34, 2005.
32. Clark DJ*, Condliffe E*, **Patten, C.** Reliability of Lower Extremity Torque Production in Persons with Post-Stroke Hemiparesis. American College of Sports Medicine, Annual Meeting, abstracted in *Medicine and Science in Sports and Exercise*, May, 2005.
33. Jonkers I*, **Patten C.**, Arnold A, Delp S. Does dynamic reflex threshold of knee extensors predict musculo-tendon lengthening velocity during hemiparetic gait? *Gait and Clinical Movement Analysis Society*, April 2005.
34. Condliffe, E.G.*, Kothari D.H., Lum, P.S., **Patten, C.** High-intensity Resistance Training Improves Reflex Modulation in Post-stroke Hemiparesis, *Society for Neuroscience Abstracts*, 2004.
35. Kothari, D.*, McGill, K.C., **Patten, C.** Severity of Motor Dysfunction Corresponds with Activation Impairment in Post-stroke Hemiparesis. *Society for Neuroscience Abstracts*, 2004
36. **Patten, C.**, Kothari, D.H., Condliffe, E.G.*, Dairaghi, C. & Lum, P.S. Effects of Dynamic High-Intensity Resistance Training on Upper-extremity Motor Function and Power in Post-stroke Hemiparesis, *World Forum for Neurological Rehabilitation*, October, 2004
37. **Patten, C.**, Kothari, D.H., Condliffe, E.*, Yap, R., Northrop, S., Lum, P.S. Improvements in Dynamic Upper-extremity Strength and Motor Activation following Resistance Training Combined with Functional Motor Relearning in Post-stroke Hemiparesis. *APTA Combined Sections Meeting*, February, 2004, abstracted in *J. Neurol Physical Therapy*, Dec, 2003.
38. Lum, P.S. **Patten, C.**, Kothari, D.H., Yap, R. Velocity-dependent deficits in torque production in post-stroke hemiparesis. *APTA Combined Sections Meeting*, February, 2004, abstracted in *J. Neurol PT*, Dec, 2003.
39. Brown, H.E.*, Kothari, D.H., Yap, R., Northrop, S., Lum, P.S., **Patten, C.** Do Strength Gains Underlie Functional Improvement in Post-stroke Hemiparesis? *APTA Combined Sections Meeting*, February, 2004, abstracted in *J. Neurol PT*, Dec, 2003.
40. Kothari, D.H.*, Northrop, S., Yap, R., Condliffe, E., Lum, P.S., **Patten, C.** Upper-extremity Strength Gains following High Intensity Resistance Training Combined with Functional Motor Relearning in Post-stroke Hemiparesis. *APTA Combined Sections Meeting*, February, 2004, abstracted in *J. Neurol PT*, Dec, 2003.
41. Northrop, S.*, Brown, H.E., Kothari, D.H., Lum, P.S., **Patten, C.** Clinical Effects of Resistance Training Combined with Functional Motor Re-learning in Post-stroke Hemiparesis *APTA Combined Sections Meeting*, February, 2004, abstracted in *J. Neurol PT*, Dec, 2003.
42. Kautz, SA; **Patten, C.**; Neptune, RR; Worthen, LC; Kim, CM. Bilateral Coordination Deficits Differ with Post-stroke Motor Recovery Status. *Society for Neuroscience Annual Meeting*, November, 2003, Abstracted in *Soc. for Neuroscience Abstracts*, Vol.
43. Chen G, **Patten C**, Kothari DH, and Zajac FE. Factors governing temporal symmetry in hemiparetic gait: Improvement on the treadmill with harness support. *8th Annual Gait and Clinical Movement Analysis Meeting*, Wilmington, DE, May 7-10th, 2003.
44. **Patten, C.**, Srisethnil J.*, Asakawa, D., Wright, G.A., Gold, G. Imaging Activation Impairment in Post-stroke Hemiparesis. *Int'l Society for Magnetic Resonance in Medicine*, May 2002.
45. Chen G, **Patten C**, Worthen LC, Kothari DH, and Zajac FE. Treadmill walking with harness support: Mechanical energetics in a healthy and hemiparetic subject. *Int'l Stroke Symposium*, Kansas City, MO, April 26-28, 2002.
46. **Patten, C.**, Whitney, J.A.*, Kothari, D., Lum, P.S. Reliability of Elbow Trajectory Tracking in Chronic Post-stroke Hemiparesis, *2002 VA RR&D Meeting*, February, 2002
47. Chen, G., **Patten, C.**, Burgar, C.G., Kautz, S.A. and Zajac, F.E. Harness-support compliance in treadmill training of post-stroke hemiparesis. *25th Annual Meeting American Society of Biomechanics (2001)*, San Diego, CA. 389-390.
48. **Patten, C.**, Gardner, M.C.*, Dickinson, L.M.*, McGill, K.C. & Zajac, F.E. Altered motor unit activity corresponds with weakness and locomotor disability in post-stroke hemiparesis. *Neurol Rep*, 24(5): 198, 2000.
49. Chen, G., Schwandt, D., Van der Loos, H., Anderson, J., Ferris, D.P., Zajac, F.E., Kautz, S.A., Burgar, C.G., **Patten, C.**, Neptune, R.R., Gordon, K.E. Compliance-adjustable, force-sensing harness support for studying treadmill training in neurologically impaired subjects. *6th Annual Gait and Clinical Movement; Analysis Meeting*, Sacramento, CA. In *Gait & Posture* 13: 293-294.
50. Kautz, S.A., **Patten, C.**, Neptune, R.R. & Harvey, J. Interlimb coordination influences on the excitation of paretic leg muscles during lower limb tasks in persons with post-stroke hemiparesis. *Society for Neuroscience Abstracts*, 26: 163, 2000.
51. **Patten, C.**, McGill, K.C., Rose, J. & Lateva, A. Common Drive Among Concurrently Active Motor Units in Cerebral Palsy and Post-stroke Hemiparesis. *Society for Neuroscience Abstracts*, 26: 462, 2000.

52. **Patten, C.**, Gardner, M.C.*, Dickinson, L.M.*, McGill, K.C. & Zajac, F.E. Altered motor unit activity corresponds with weakness & locomotor disability in post-stroke hemiparesis. *Neurol Rep*, 24(5): 198, 2000.
 53. **Patten C.**, Gardner M*, McGill KC & FE Zajac. Motor Unit Firing Patterns in Hemiparesis. 2nd National VA Rehabilitation Research & Development Service Conference, Washington, D.C., February, 2000.
 54. **Patten C.**, van Emmerik REA & Kamen G. Motor Unit Discharge Rate Variability: Adaptation in Frequency Content with Force Control Training. *Med Sci Sports & Exercise*, 31(5) Supplement, S136. 1999.
 55. Kamen G., **Patten C.**, Rowland D.M. Motor Unit Synchronization in Young and Older Adults Following Resistance Training. Abstracted in *Society for Neuroscience Abstracts*, 24: 424, 1998.
 56. **Patten C.**, Kamen G, Rainsford KA & Porter MM. Adaptations in Antagonist Motoneuron Excitability in Young and Older Adults. *Society for Neuroscience Abstracts*, 23: 2237, 1997.
 57. **Patten C.**, van Emmerik REA & Kamen G. Motor Unit Discharge Rate Variability: Age and Training Related Adaptations in Frequency Content. American College of Sports Medicine, Annual Meeting, Denver, CO, May, 1997. Abstracted in *Medicine & Science in Sports & Exercise*, 29(5), S1127, May 1997.
 58. **Patten, C.**, Kamen, G. Adaptations in Human Motor Unit Discharge Behaviour to Strength Training. *Society for Neuroscience*, Washington, D.C., November, 1996.
 59. **Patten, C.**, Kamen, G. Adaptations in Motor Unit Discharge Behaviour Following Isometric Resistance Training in Young and Older Adults. *Canadian Society for Biomechanics*, Biennial Meeting, Vancouver, B.C., August, 1996.
 60. **Patten, C.**, Burke JR, Kamen G, Rowland D. Age and Practice Effects on Motor Unit Discharge Variability. in *Society for Neuroscience Abstracts*, 21: 1433, 1995.
 61. **Patten, C.**, Kamen G., Rowland D., Du CC. Rapid Adaptations in Motor Unit Firing Rate During the Initial Phase of Strength Development. American College of Sports Medicine, Annual Meeting, Minneapolis, MN, June 1995. Abstracted in *Medicine and Science in Sports and Exercise*, Supplement, June, 1995.
 62. Leong, B., Kamen G., **Patten C.**, Du C.C. Motor Unit Discharge Rates in Older Weight Lifters During Maximal Voluntary Contractions. American College of Sports Medicine, Annual Meeting, Minneapolis, MN, June 1995. Abstracted in *Medicine and Science in Sports and Exercise*, Supplement, June, 1995.
 63. Krebs, D.E., Riley, P.O., **Patten, C.**, Horak, F.B. Head and Body Center of Gravity (CG) Biomechanics: Locomotor Control Adaptations to Vestibular Loss and Rehabilitation. Second World Congress of Biomechanics, Amsterdam, The Netherlands, July, 1994.
 64. **Patten, C.**, Hillel, A.D. Comparisons of Upper Extremity Isokinetic Muscle Performance Between Older and Young Normal Adults. *Physical Therapy*, Volume 74 (5), Suppl. PO-084-T, 1994.
 65. **Patten, C.**, Krebs, D.E., Horak, F.B., Riley, P.O. Head and Body Center of Gravity Control Strategies: Adaptations Following Vestibular Rehabilitation. *Physical Therapy*, Vol. 74 (5), Suppl. PL-351-SA.
 66. Kamen, G., Sison, S.V., Du, C.C., **Patten, C.** Motor Unit Discharge Rates During Maximal Effort in Older Adults. Abstracted in: *Proceedings Triennial Meeting of International Union of Physiological Scientists*, Glasgow, Scotland, July 1993.
 67. **Patten, C.**, Kamen, G., Sison, S.V., Du, C.C. Improvements in Balance in Young and Older Adults Documented by Accelerometry. American College of Sports Medicine, Annual Meeting, Seattle, Washington, June 1993. *Medicine and Science in Sports and Exercise*, Volume 25 (5), S198.
 68. **Patten, C.**, Kamen, G., Sison, S.V., Du, C.C. Quantitative Assessment of Balance Performance in Young and Older Normal Subjects. Combined Sections Meeting, Section on Neurology, American Physical Therapy Association. San Antonio, Texas, February, 1993. Abstracted in *Neurology Report*, Volume 16 (4), 1993.
 69. Kamen G., **Patten, C.**, Du CC. Assessment of Balance Function in Older Adults. *International Society for Physical Activity, Aging, and Sport*. Jyvlaska, Finland, June 1992.
 70. **Patten, C.**, Hillel, A.D. The Eleventh Nerve Syndrome: Accessory Nerve Palsy or Adhesive Capsulitis? American Society for Head and Neck Surgery. Kona, Hawaii, May 1991. Abstracted in *Archives of Otolaryngology/Head and Neck Surgery*, May 1991.
- (name denotes student or fellow as first author, name* denotes student or fellow supervised by C. Patten)

Invited Presentations

1. **Patten, C.** "A Mechanism-based Framework for Neurorehabilitation." Invited Speaker, 31st Annual Braintree Neurorehabilitation Conference, Cambridge, MA., November, 2010.
2. **Patten, C.** "Upper-extremity motor recovery post-stroke: learning the movement or changing the strategy?" Invited Speaker, 31st Annual Braintree Neurorehabilitation Conference, Cambridge, MA, November, 2010.
3. **Patten, C.** "Robotic Gait Training Post-stroke - more than going through the motions" North American Neurorehabilitation Symposium, The Shepherd Center, Atlanta, GA; August, 2010

4. **Patten, C.** "Bridging Science and Clinical Practice: You can be that Scientist!" Symposium at APTA Combined Sections Meeting, February, 2010.
5. **Patten, C.** Therapeutic Effects on Neuromechanical Control of Gait Post-stroke. *Contribution to Symposium: An instrumented step beyond gait speed: Mechanisms of Gait Dysfunction and Recovery Post-stroke.* (Session Chair) APTA Combined Sections Meeting, February, 2010.
6. **Patten, C.** Behavioral Correlates of neurologic dysfunction and recovery: Assessments for translational research. Symposium contribution at Winter Conference on Brain Research, January, 2010.
7. **Patten, C.** A Tale of Two Hemispheres: Using TMS to Study How Inter-hemispheric Inhibition Affects Motor Function Post-stroke. Brain Rehab Research Center, Malcom Randall VAMC, Gainesville, FL. October, 2009
8. **Patten, C.** Role of Reflex Regulation in Upper-extremity Functional Motor Adaptations Post-stroke. Brain Rehabilitation Research Center, Malcom Randall VA Medical Center, Gainesville, FL. April, 2009
9. **Patten, C.** Neural and Biomechanical Determinants of Bilateral Locomotor Control Post-stroke. Biomedical Engineering Seminar Series, University of Florida, April 8, 2009.
10. **Patten, C.** Neuromotor Contributions to Walking Function Post-stroke. Invited Seminar at: Center de Recherche Interdisciplinaire en Réadaptation du Montréal, Université du Montreal, Montreal, Québec, CANADA. February, 2009.
11. **Patten, C.** Principles of Motor Learning for Neurorehabilitation. State of the Science Conference, Walter Reed Army Medical Center, Washington, D.C., January, 2009.
12. **Patten, C.** Power to the (hemiparetic) people -Neuromechanical Adaptations to Novel Locomotor Training Paradigms in Persons Post-stroke. University of California, San Francisco - Neurobehavioral Core for Rehabilitation Research (NCRR), October, 2008.
13. **Patten, C.** Is there a Role for Robotics in Rehabilitation? Invited presentation at APTA National Student Conclave, San Jose, CA, October, 2008.
14. **Patten, C.** Intervention approaches for paralysis and weakness. *Contribution to Concentrated Educational Series (Concentrated Educational Series): Recovery and Rehabilitation after Stroke,* American Physical Therapy Association Annual Conference, San Antonio, TX, June, 2008.
15. **Patten, C.** Gait speed modulation in post-stroke hemiparesis. *Contribution to Altering Locomotion through Learning and Conscious Control: what are the implications for rehabilitation?* Neural Control of Movement Society, Naples, FL, May, 2008.
16. **Patten, C.** Desperately seeking Synergy! An update from the upper-extremity research initiative. Brain Rehabilitation Research Center, Malcom Randall VA Medical Center, Gainesville, FL. April, 2008.
17. **Patten, C.** Innovative Approaches to Promoting Upper-extremity Recovery. *Contribution to: Emerging Therapies and Technologies in Brain Rehabilitation,* VA HSR&D National Meeting, February, 2008.
18. **Patten, C.** Optimizing the scheduling and type of exercise to maximize functional outcomes. Invited contribution to symposium: *Rehabilitation Intervention Effectiveness: Impact of Dose-response and Timing Post-stroke,* International Stroke Conference, New Orleans, LA, February, 2008.
19. **Patten, C.** Power to the hemiparetic people - neuromechanics of gait in post-stroke hemiparesis. Rehabilitation Sciences Symposium, Dept of Physical Therapy, University of Florida, November, 2007.
20. **Patten, C.** Can strengthening produce functional improvements in gait following stroke? Invited contribution to symposium: *Utilizing exercise as a Research and Rehabilitative Tool in Special Populations,* Canadian Society of Exercise Physiology, London, Ontario, CANADA, November, 2007.
21. **Patten, C.** Physical Therapy Interventions with Robotics. Invited presentation at APTA National Student Conclave, Valley Forge, PA, October, 2007.
22. **Patten, C.** Neurophysiological Mechanisms and Biomechanical Consequences of Weakness in Post-stroke Hemiparesis. Seminar, Faculty of Medical Rehabilitation, University of Manitoba, Winnipeg, Manitoba, CANADA, January, 2007.
23. **Patten, C.** Neurophysiological Mechanisms and Biomechanical Consequences of Weakness Post-stroke . Seminar, Faculty of Physiology, University of Manitoba, Winnipeg, Manitoba, CANADA, January, 2007.
24. **Patten, C.** Neurophysiological Mechanisms and Biomechanical Consequences of Weakness in Post-stroke Hemiparesis, Seminar, Department of Physical Therapy and VA Brain Rehabilitation R&D Center, University of Florida, Gainesville, FL, December, 2006.
25. **Patten, C.** Neurophysiological Mechanisms and Biomechanical Consequences of Weakness in Post-stroke Hemiparesis. Faculty of Biomedical Kinesiology, Katholieke University, Leuven, BELGIUM, November, 2006.

26. **Patten, C.** Strengthening to Promote Recovery of Function in Neurologic Populations. Invited course (2.5 days) at Hoge School Physiotherapie and University Rehabilitation Centre, Heerlen, **THE NETHERLANDS**. November, 2006.
27. **Patten, C.** Combined Dynamic Resistance Training and Functional Task Practice Promote Greater Recovery of Upper-extremity Function in Post-stroke Hemiparesis. *Update on Neurorehabilitation (Bay Area Regional III-STEP Conference)*, hosted by Kaiser-Permanente/Samuel Merritt College, September, 2006.
28. **Patten, C.** Its not about the muscle.....strengthening vs. functional task practice for motor rehabilitation post-stroke. Seminar, Department of Physical Therapy and Biokinesiology, University of Southern California, Los Angeles, CA, 29 August, 2006.
29. **Patten, C.** Effectiveness of Strengthening on Functional and Neurologic Recovery: Evidence From Adults and Children. Educational Session with Katherine Sullivan, Ph.D., PT and Samuel C. Lee, Ph.D., PT at APTA Annual Conference, Orlando, Florida, June, 2006.
30. **Patten, C.** Fundamental Strategies for Musculoskeletal Rehabilitation. Monthly Musculoskeletal Research Lecture, Dept. of Orthopaedic Surgery, Stanford University Medical School, May 2006.
31. **Patten, C.** But Doctor, I can't get my strength back.....Understanding Weakness in Post-stroke Hemiparesis. Invited seminar at Center For Applied Biomechanics and Rehabilitation Research (CABRR), National Rehabilitation Hospital, November, 2005.
32. **Patten, C.** Contemporary Perspectives on Motor Rehabilitation Post-stroke. Invited Seminar, Dept of Physical Therapy & Rehabilitation Sciences, University of California, San Francisco, November, 2005.
33. **Patten, C.** Research Update - Neurorehabilitation for Post-stroke Hemiplegia. Invited Symposium, Abilities Expo, Santa Clara, California, November, 2005.
34. **Patten, C.** Promoting Recovery of Upper-extremity Function in Post-stroke Hemiparesis: Dynamic High-intensity Resistance Training Contrasted with Functional Motor Relearning. San Jose District APTA, November, 2005.
35. **Patten, C.** Dynamic High Intensity Resistance Training Improves Upper Extremity Motor Function, Power and Reflex Modulation Post-stroke. Invited contribution to symposium, *Upper Extremity Motor Control and Rehabilitation*, Biannual Motor Control Conference, Varna, **BULGARIA**, September, 2005.
36. **Patten, C.** Evidence that both Motor Learning and strength Training drive Upper-extremity recovery Post-stroke, contribution to session: *Neuroplasticity in Relation to Functional Recovery – What is the Human Clinical Evidence?* III-STEP (Summer Institute on Translating Evidence into Practice: Linking Movement Science and Intervention), Salt Lake City, Utah, July, 2005.
37. **Patten, C.** Emerging Technologies in Rehabilitation Research & Development Invited symposium at VA Senior Management Conference, Washington, D.C., August, 2004
38. **Patten, C.** How Foundation Research Facilitates Follow-on Funding Invited contribution to Symposium: *Foundation Funding, Where It Goes*. Combined Sections Meeting, APTA, Nashville, TN, February, 2004
39. **Patten, C.** Doctor, I can't get my strength back.....why we are weak following stroke. Five College Life Sciences Colloquium (invited), Smith College, November 10, 2003.
40. **Patten, C.** Why is scientific research important to physical therapy clinicians? Invited contribution to Symposium: *Foundation Funding, Where It Goes*. Combined Sections Meeting, APTA, Tampa, FL, Feb, 2003
41. **Patten C.** Identifying mechanisms of weakness in post-stroke hemiplegia. Seminar, Department of Physical Therapy and Biokinesiology, University of Southern California, Los Angeles, CA, Oct, 2002.
42. **Patten, C.** Is there evidence for neurorehabilitation practice? Invited contribution to Symposium: *Function-focused rehabilitation for the neurologic patient*. American Physical Therapy Assn. Annual Meeting & Scientific Exposition, Anaheim, CA, 2001.
43. **Patten, C.** Motor unit firing patterns in Hemiplegia - Identifying Mechanisms Contributing to Weakness in Post-stroke Hemiparesis. Invited contribution to Symposium: *From Gee Whiz to What Is?* American Society of Neurorehabilitation, San Diego, California, April, 2000. (focus on applications of biomedical engineering in clinical practice of neurorehabilitation).
44. **Patten, C.** Measuring Clinically Important Aspects of Balance & Gait. Invited contribution to Symposium: *Measurement of Balance and Gait*, 2nd VA RR&D Service Meeting, Washington, D.C., February 2000.
45. **Patten, C.** Motor unit firing patterns and age related changes Invited presentation for symposium on Motor unit firing patterns in voluntary movements. International symposium on *Motor control in human voluntary upper limb precision tasks*, Copenhagen, **DENMARK**, 25-27 November, 1999.

46. **Patten, C.** Variability in Motor Unit Discharge Activity: Effects on Force Regulation and Movement Control with Aging. Presentation for *Movement Control Symposium*. International Society of Biomechanics, Calgary, Alberta, CANADA, August, 1999.
47. **Patten, C.** Career Development and Mentoring. VA Rehabilitation Symposium, Houston, Texas, June, 1999.
48. **Patten, C.** Age and Training-related Adaptations in Motor Unit Control Properties. Invited seminar, Neurological Sciences Institute, Oregon Health Science University, Portland, OR, February 26, 1999.
49. **Patten, C.** Repetitive Strain Injuries: Causes, Treatment, & Prevention. Invited presentation to Massachusetts Society of Court Reporters Annual Conference. Braintree, MA. October 19, 1996.
50. **Patten, C.** Musculoskeletal considerations in prescribing exercise for older adults. Workshop contribution to *Exercise: Promoting Function and Independence in the Elderly*. Boston University Summer Institute in Gerontology, June 21, 1995.
51. **Patten, C.** Interpreting the Clinical Test of Sensory Integration and Balance. Invited inservice presentation at Spaulding Rehabilitation Hospital, Boston, Massachusetts, July, 1994.
52. **Patten, C.** Using the Motion Lab to Answer Clinical Questions. Invited presentation at *Biomechanics of Human Movement in Orthopaedics, Rehabilitation & Sports*. Massachusetts Institute of Technology, June, 1994.
53. **Patten, C.** Managing Balance Problems in the Older Patient. Symposium Lecture for: *Rehabilitation in the Elderly -- Neuro-Musculo-Skeletal Considerations*. American Academy of Cardiovascular and Pulmonary Rehabilitation, Annual Conference. Orlando, Florida. October 1993.
54. **Patten, C.** Assessment and Treatment of Balance Disorders in Physical Therapy Regional Inservice, Kaiser-Permanente of the Mid-Atlantic States, April, 1993.

Research Experience

Senior Research Scientist/ Upper-extremity Research Initiative Leader (GS-14)

Brain Rehabilitation Research Center, Malcom Randall VA, Gainesville, Florida

Coordinate interdisciplinary Upper-extremity Research Initiative including collaborations with: BRRC Neuroscience Research Initiative, NeuroImaging Core, Human Motor Performance Lab Core, Behavioral Measurement Core. Mentorship of young investigators.

October, 2008 - date

Research Scientist/ Upper-extremity Research Initiative Leader (GS-13)

Brain Rehabilitation Research Center, Malcom Randall VA, Gainesville, Florida

Coordinate interdisciplinary Upper-extremity Research Initiative including collaborations with BRRC Translational Research Initiative

August, 2007 - October, 2008

Research Scientist/RR&D Center Core Principal Investigator (GS-13)

one of eight RR&D Center Core Investigators

Rehabilitation R&D Center of Excellence, VA Palo Alto Health Care System

Directed interdisciplinary Neural Control of Movement/Neurorehabilitation Program

October 2002 - August, 2007

Research Scientist/Principal Investigator (GS-12) (VA CDA-II Recipient)

Rehabilitation R&D Center of Excellence, VA Palo Alto Health Care System

Responsible for research lines investigating functional motor recovery in post-stroke hemiparesis

January 2001 - October 2002

Post-Doctoral Fellow, (VA CDA-I Recipient)

Rehabilitation R&D Center of Excellence, VA Palo Alto Health Care System

Investigation of neurophysiology and biomechanics of weakness in post-stroke hemiparesis

January 1998 - January 2001

Graduate Research Assistant

Motor Control Laboratory - Boston University, Department of Physical Therapy

September 1993 - August 1995.

Motor Control Laboratory - University of Massachusetts Department of Exercise Science

September 1995 - January 1998.

Research Assistant

Motor Control Laboratory - Boston University, Department of Physical Therapy

May 1991- July 1992.

Research Associate and Project Manager

Seattle VA Medical Center, Department of Otolaryngology/Head & Neck Surgery
July 1987 - June 1990.

Academic Experience

Associate Professor (2007 -)

University of Florida, School of Public Health & Health Professions

Tenure Awarded, May 2008

Department of Physical Therapy

(jointly appointed in Department of Neurology (College of Medicine) and Department of Applied Physiology & Kinesiology (College of Health & Human Performance))

Provide lectures in PHT 6761 & PHT 6762 (Neurorehabilitation I & II) in DPT Curriculum; Responsible for: PHT6935 (Analytical Techniques in Human Movement) and RSD 8111/Neuroscience 8111 (Translational Neuroscience Research) taught jointly with Jeff Kleim, Ph.D. in the Rehabilitation Sciences and College of Medicine, Neuroscience Doctoral Programs

Clinical Associate Professor (2005 - 2007)

Stanford University School of Medicine

Department of Orthopaedic Surgery, Division of Physical Medicine & Rehabilitation

Provided PM&R Resident Core Lectures on Therapeutic Interventions in PM&R Practice and Evidence-Based Practice; Member of Research Oversight Committee

Human Biology Program

HumBio 136 - Neural Basis of Human Movement

Clinical Assistant Professor (2005 - 2007)

University of California, San Francisco/San Francisco State University

Department of Physical Therapy & Rehabilitation Science

Provided lectures in PT 710 (Neurological Pathokinesiology I); Directed MSPT and DPT student research experiences and projects PT 890 & PT 419; contributing faculty for DPTSci students

Consulting Assistant Professor (2003 - 2005)

Stanford University School of Medicine

Department of Orthopaedic Surgery, Division of Functional Restoration

Adjunct Assistant Professor (2004 - 2007),

Boston University, Department of Rehabilitation Sciences

Developed and taught online version of PT 634 (Diagnostic Procedures for Rehab Professionals)

Supervised graduate and doctoral student research

Assistant Professor (2002-2004)

Boston University, Department of Rehabilitation Sciences,

PT 634 (Diagnostic Procedures for Rehabilitation Professionals), selected lectures in neurology, neuro-rehabilitation, geriatrics, motor control, research), graduate student supervision

Consulting Assistant Professor (1998 - 2003)

Stanford University School of Medicine

Department of Functional Restoration

Adjunct Assistant Professor (1997-1998)

American International College, Department of Physical Therapy

Life Span Development, Motor Control

Graduate Teaching Assistant

University of Massachusetts, Department of Exercise Science

Exercise Science 611 (Research Seminar- Design and Methods)

Coordinator - Talent Advancement Program (TAP) (1996-1998)

Adjunct Lecturer (1993-1995)

Graduate Teaching Assistant (1994-1995)

Boston University, Department of Physical Therapy

PT 652, 653 (Neurological Systems II & III), HP 771 (Foundations of Motor Control)

Mentoring

Post-doctoral Fellows & Career Development Award Recipients

- Keith McGregor, Ph.D. -
Level-1 Career Development Award, VA Rehabilitation R&D Service - **Mentor**. Dates to be determined. "Effects of Aerobic Fitness on Neurological Markers of Aging"
- Mark C. Bowden, Ph.D., PT -
Level-1 Career Development Award, VA Rehabilitation R&D Service - **Mentor**. January, 2010 - December, 2012. "Evaluation of Walking Specific Motor Learning Post-stroke."
- David J. Clark, Sc.D. -
Level-2 Career Development Award, VA Rehabilitation R&D Service - **Mentor**. January, 2010 - December, 2014. "Neural Determinants of Impaired Locomotor Adaptability Post-stroke"
- Rachael Allred, Ph.D. -
Post-doctoral Fellow, Dept. of Neurology T-32 Training Grant, **Mentorship committee**, Sept 2009 - date.
- Dorian K. Rose, Ph.D., PT -
Level-2 Career Development Award, VA Rehabilitation R&D Service - **Primary Mentor**. September, 2009 - August, 2014. "Combining neural and behavioral therapies to enhance stroke recovery"
NIH K12 Scholar - June, 2009 - June 2012, **Primary Mentor**.
- Michelle Woodbury, Ph.D., OTR/L - Level-2 Career Development Award, VA Rehabilitation R&D Service - **Primary Mentor**. September, 2008 - August, 2011. "A toolbox for measuring post-stroke upper extremity motor ability"
- Christopher Gregory, Ph.D., PT -
Level-2 Career Development Award, VA Rehabilitation R&D Service - **Mentor**. June, 2008 - June, 2011.
"Skeletal muscle properties and the metabolic cost of walking post-stroke"
NIH K12 Scholar - October, 2008 - June 2012, **Mentor**.
- Chetan Phadke, Ph.D., PT - Post-doctoral Fellow - January, 2008 - August, 2009
- Christopher T. Robertson, Ph.D. - Post-doctoral Fellow, VA RR&D Service Associate Investigator Award, June 2007 - July 2010.
- Kelly P. Westlake, Ph.D., PT - Post-doctoral Fellow, Canadian Institutes of Health Research - Clinical Initiative, Post-doctoral Research Award, February, 2007 - December, 2007
- Joanne M. Wagner, Ph.D., PT - Post-doctoral Fellow, VA RR&D Service Associate Investigator Award, June 2006 - December 2007
- Michael Harris-Love, Ph.D., PT - NIH Bone & Joint Decade Young Investigator - Mentor, February 2006 - December 2007.
- Ilse Jonkers, Ph.D., PT - Post-doctoral Fellow, Flemish Research Council - Co-supervisor with Scott Delp, Ph.D., June 2004 - June 2006

Graduate Students

- Virginia Little, MSPT, NCS - University of Florida, Rehabilitation Sciences, Ph.D. student, enrolled August 2008 -
Degree expected May 2013
- Martina Spiess, PT, MS - University of Florida, Rehabilitation Sciences, Ph.D. candidate, enrolled August 2008 - Degree
Expected May 2012 (Recipient of University of Florida Alumni Fellowship)
Co-mentorship with Andrea Behrman, Ph.D., PT
- Manuela Corti, PT - University of Florida, Rehabilitation Sciences, Ph.D. candidate, enrolled January, 2008 -
Degree Expected May 2012 (Recipient of University of Florida Alumni Fellowship)
- Shilpa Patil, PT - University of Florida, Rehabilitation Sciences, Ph.D. student, transferred to my supervision January,
2008 - Degree expected May 2011
- David J. Clark - Boston University, Movement and Rehabilitation Sciences Program, Sc.D., September 2002 - May,
2007. Defense April, 2007. Graduation, May, 2007.
- Aaron Grogan - Boston University, Dept. of Biomedical Engineering, Master's Degree, graduation Spring, 2006
- Elizabeth G. Condliffe - Boston University, Department of Biomedical Engineering, Master's Student, graduation,
Spring, 2004

Thesis & Dissertation Committees

<i>Candidate</i>	<i>Institution, Program and Degree</i>	<i>Inclusive dates</i>	<i>Degree Conferred</i>
Neha Loda, M.S.	University of Florida Applied Physiology & Kinesiology, Ph.D. Committee Chair, James Cauraugh, Ph.D.	2009 - date	
Zuha Warrich, M.S.	University of Florida Neuroscience, Ph.D. Committee Chair, Jeffrey A. Kleim, Ph.D.	2009 - date	
Bhavna Raja, PT	University of Florida Rehabilitation Sciences, Ph.D. Committee Chair, Steven A. Kautz, Ph.D.	2009 - date	
Amit Sethi, MS, OTR	University of Florida Rehabilitation Sciences, Ph.D. Committee Chair, Lorie G Richards, Ph.D., OT	2008 - date	
Sagar Naik, P.T.	University of Florida Applied Physiology & Kinesiology, M.S. Committee Chair, James Cauraugh, Ph.D.	2008 -2009	December, 2009
Melanie Lomaglio, PT	University of British Columbia CANADA Rehabilitation Sciences, M.Sc. Committee Chair, Janice J. Eng, Ph.D., PT/OT	Spring, 2005	May, 2005
George Chen, MS	Stanford University Mechanical Engineering, Ph.D. Committee Chair, Felix E. Zajac, III, Ph.D.	2001- 2003	Spring, 2003

Undergraduate Honors & Physical Therapy Student Research

1. Stacey Ann Beam – Washington & Jefferson College, Research Internship, Summer, 2010
2. Mae Mercado – University of Florida, Department of Health Sciences, Undergraduate Honors Research Advisor, Spring 2010 – 2011
3. David Moshe – University of Florida, Department of Health Sciences, Undergraduate Honors Research Advisor, Spring 2010 – 2011.
4. Alicia Anderson – University of Florida, Department of Health Sciences, Undergraduate Honors Research Advisor, Spring 2009 – 2010. (*Magna Cum Laude. Admitted to University of Florida, DPT Class of 2013*)
5. Kristen Gangarossa - University of Florida, Department of Health Sciences, Undergraduate Honors Research Advisor, Spring 2009 – 2010. (*Summa Cum Laude. Admitted to University of Florida, DPT Class of 2013*)
6. Katie Marcoux - University of Florida, Department of Health Sciences, Undergraduate Honors Research Advisor, Spring 2009 – 2010. (*Summa Cum Laude. Admitted to University of Florida, DPT Class of 2013*)
7. Jennifer DeMarco – University of Florida, Department of Applied Physiology & Kinesiology, Research Practicum, Summer 2007; Directed Research, Fall 2007.
8. Sang Pak – University of California, San Francisco, Department of Physical Therapy and Rehabilitation Sciences, DPT student research internship, 2006-2007 Academic Year
9. Tianna Meriage – University of California, San Francisco, Department of Physical Therapy and Rehabilitation Sciences, DPT student research internship, 2006-2007 Academic Year
10. Jennifer Rhodes - University of California, San Francisco, Department of Physical Therapy and Rehabilitation Sciences, MSPT student research internship, 2006-2007 Academic Year
11. Liza Yanuzzi - University of California, San Francisco, Department of Physical Therapy and Rehabilitation Sciences, MSPT student research internship, 2006-2007 Academic Year
12. Jennifer Whitney – California State University, Long Beach, Dept. of Physical Therapy, Master’s Research Project, Summer, 2001.
13. Allison Magruder – California Polytechnic University, San Luis Obispo, Paralyzed Veterans of America Summer Scholars Program, Summer 2000.
14. Mark C. Gardner – Dept of Physical Therapy, Arcadia University. Master’s Research Project, Summer 1999.
15. Frederick J. Rumford, III – Department of Exercise Science, University of Massachusetts. Research Independent Study & Undergraduate Honors Thesis Committee, January –August, 1999.

16. Cheng Feng – University of Texas, Paralyzed Veterans of America Summer Scholars Program, Summer 1998.
17. Kara A. Rainsford – Department of Exercise Science, University of Massachusetts. Research Independent Study, Academic Year 1996-97.
18. Shannon E. Chabot – Dept. of Exercise Science, University of Massachusetts. Research Independent Study, Academic Yr 1996-97.
19. Daniel M. Rowland – Department of Biomedical Engineering, Boston University. Senior Biomedical Engineering Research Project, Academic Year 1993-94.

Student & Trainee Honors & Awards

- ***Alicia Anderson***
 - i. UF College of Public Health & Health Professions Undergraduate Student Research Award, April 2010
- ***Stacey Beam***
 - i. Washington & Jefferson College, Magellan Award, Summer 2010
- ***David J. Clark, Sc.D.***
 - i. Dudley Allen Sargent Research Grant, Boston University, 2005
 - ii. Post-doctoral Student Poster Award, UF Neuromuscular Plasticity Symposium, December, 2007
- ***Manuela Corti, PT***
 - i. University of Florida Alumni Fellowship, January 2008 – August 2011
 - ii. University of Florida Graduate Student Travel Award, Summer 2008
 - iii. University of Florida International Student Award, November, 2008
 - iv. UF College of Public Health & Health Professions Graduate Student Research Award, April 2009
 - v. Southeastern Region - American Society for Biomechanics, Graduate Student Poster Award, April 2009
 - vi. Bryan Robinson Neuroscience Endowment Grant (Tallahassee Memorial Foundation), June 2010
- ***Elisa Gonzalez-Rothi, DPT***
 - i. NIH T-32 Fellowship
 - ii. Foundation for Physical Therapy Florence Kendall Scholarship, November 2008
 - iii. Foundation for Physical Therapy, Promotion of Doctoral Studies-Level I, June 2009
 - Barnes-Leahy Endowed Scholarship for Neurology
- ***Christopher Gregory, Ph.D., PT***
 - i. NIH K-12 Fellow
- ***Virginia Little, PT, NCS***
 - i. Foundation for Physical Therapy Florence Kendall Scholarship, November 2008
 - ii. Foundation for Physical Therapy, Promotion of Doctoral Studies-Level I, June 2009
 - iii. Graduate Student Poster Award, UF Neuromuscular Plasticity Symposium, March, 2010
 - iv. Foundation for Physical Therapy, Promotion of Doctoral Studies-Level I, June 2010
 - Barnes-Leahy Endowed Scholarship for Neurology
- ***Katie Lynn Marcoux***
 - i. Undergraduate Dean's Scholar, UF College of Public Health & Health Professions, 2010
- ***Mae Mercado***
 - i. University of Florida Undergraduate Honors Program University Professors Scholarship, 2010-2011
- ***Shilpa Patil, PT***
 - i. Post-professional Student Research Award, APTA Section on Neurology, February, 2010
- ***Chetan Phadke, Ph.D., PT***
 - i. Post-doctoral Student Poster Award, UF Neuromuscular Plasticity Symposium, December, 2008
- ***Dorian K. Rose, Ph.D., PT***
 - i. NIH K-12 Fellow
- ***Martina Spiess, PT, M.Sc.***
 - i. University of Florida Alumni Fellowship, August 2008 – August 2012
- ***Kelly P. Westlake, Ph.D., PT***
 - i. Canadian Institutes of Health Research Post-doctoral Fellowship, November 2006-2011
 - ii. University of California, San Francisco, School of Medicine Travel Award, November, 2008

Professional Experience

Professional Positions

Physical Therapist - Optimum Rehab, Sundance Rehabilitation. (Adult & geriatric neurology, subacute rehab). University Health Services-UMass/Amherst (Kaiser-Permanente Affiliate) (Outpatient/HMO). April 1995 - January 1998.

Clinical Specialist - Boston VA Medical Center, Physical Medicine and Rehabilitation Service, Physical Therapy Section. Adult Neurology and Research. January 1995 - April 1995.

Senior Physical Therapist - Boston VA Medical Center, PM&R Service, Physical Therapy Section. Adult Neurology, Research (60% Clinical/40% Research). June 1993-January 1995

Physical Therapist - Baltimore VA Medical Center, Rehabilitation Medicine Service. Acute Care, Neurology, Outpatient. September 1992 - June 1993.

Professional Licensure

Physical Therapist - California License #22929, Massachusetts License #9246

University & Professional Service

Manuscript Reviewer

Computer Methods in Biomechanics and Biomedical Engineering, 2009 -
Neuroscience Letters, 2009 -
Human Movement Science, 2009 -
Clinical Biomechanics, 2009 -
Journal of Electromyography and Kinesiology, 2008 -
Stroke, 2007 -
Disability & Rehabilitation, 2007 -
Physiotherapy Research and Practice, 2007 -
Clinical Neurophysiology, 2006 -
Neurorehabilitation and Neural Repair, 2006 -
Journal of NeuroEngineering and Rehabilitation, 2005 -
Archives of Physical Medicine and Rehabilitation, 2005 -
Physical Therapy, 2005 -
IEEE Transaction on Systems, Man and Cybernetics - Part B, 2005 -
Journal of Neurologic Physical Therapy, 2005-
Muscle & Nerve, 2005 -
Journal of Neurophysiology, 2003 -
Experimental Brain Research, 2003 -
Canadian Journal of Applied Physiology, 2003 -
Journal of Clinical Neurophysiology, 2003 -
Journal of Applied Physiology, 2001 -
Journal of Rehabilitation Research & Development, 2000 -
European Journal of Applied Physiology. 2000 -
Journal of Gerontology: Medical Sciences, 1999 -
Journal of Orthopaedic and Sports Physical Therapy, 1998-
Medical Engineering and Physics, 1998-
Medicine and Science in Sports and Exercise, 1997-
APTA Cardiopulmonary Section, 1995-

Journal Editorial Boards & Committees

- Physical Therapy Journal
Editorial Board Member
June, 2007 - date
- Physical Therapy Journal
Steering Committee
April 2006 - June 2007

Scientific Review Committees

- American Stroke Association

- Scientific Review Committee
May, 2007 – present
- American Physical Therapy Association - Section on Neurology
Research Committee, Chairman
2002 – 2006
- American Physical Therapy Association - Section on Neurology.
Research Committee Member
2000 – 2007

Grant Review Panels

- National Institutes of Health, Emerging Technologies and Training in Neurosciences IRG
Ad Hoc Reviewer, June, 2010
- Foundation for Physical Therapy
Ad Hoc Reviewer
Summer, 2010
Chair, Scientific Review Committee
January 2007 – December 2009
Scientific Review Committee
January 2005 – December 2009
- Canadian Stroke Network
Expert Scientific Review Committee
January, 2008; January, 2009
- National Institutes of Health, NINDS
Ad Hoc reviewer, NINDS-K Clinical Trials Study Section
February, 2007
- International Conference on Rehabilitation Robotics
Awards Review Committee, 2005
- Department of Veterans Affairs
Merit Review Panel
Scientific Reviewer, Winter 2004, Fall 2004, Spring 2005
Office of Research & Development Annual Meeting Abstract Reviewer, 2003
- NASA - Musculoskeletal Biology, Exercise and Countermeasures Review Panel
Spring, 2002

University & College Committees

- Institutional Review Board, Health Sciences Center, University of Florida
 - August, 2009 - present
- Tenure and Promotion Committee, College of Public Health & Health Professions, University of Florida
 - August, 2008 - present

Departmental & Institutional Committees

- Research and Development Committee, Malcom Randall VA Medical Center
Medical Center-wide committee for review and oversight of research activity
July 2009 - present
- Search Committee
Department of Applied Physiology & Kinesiology, University of Florida
Assistant/Associate Professor, Biobehavioral Control
2008-09 Academic Year
- Search Committee
Department of Physical Therapy, University of Florida
Associate/Full Professor Neural Plasticity and Neurorehabilitation
2008-09 Academic Year
- Task force on Doctoral Program Development
Rehabilitation Sciences Doctoral Program, University of Florida
September 2008 – present
- Professional and Leadership Development Committee
Department of Physical Therapy, University of Florida

- September, 2008 - present
- Subcommittee for Clinical Investigation, Malcom Randall VA Medical Center
Subcommittee of medical center-wide R&D committee
December, 2007 - present
- Brain Rehabilitation Research Center, Malcom Randall VA Medical Center
Executive Committee
Coordinator, Upper Extremity Research Initiative
- Research and Development Committee, VA Palo Alto Health Care System
Medical Center-wide review committee
November 2006 - August 2007
- Rehabilitation R&D Subcommittee
VA Palo Alto Health Care System
November 2006 - August 2007

Professional Associations

- American Physical Therapy Association - Section on Research
Chair, Planning Committee 2012 Research Retreat
March 2010 - date
- American Physical Therapy Association
Taskforce on Women's Initiatives
August 2009 - date
- American Physical Therapy Association - Section on Neurology
Research Committee, Co-chairman for Strategic planning
2006 - 2008
- American Physical Therapy Association.
Program Committee Reviewer for Neurology Section
2000 - 2003

Session Chair

- Bridging Science and Clinical Practice: You can be that Scientist! Symposium at APTA Combined Sections Meeting, February, 2010.
- An instrumented step beyond gait speed: Mechanisms of Gait Dysfunction and Recovery Post-stroke. APTA Combined Sections Meeting, February, 2010.
- Modulatory Mechanisms of Motor Control - *Mechanisms Underlying Disordered Movement: Impairments with Force Generation. Research Retreat - APTA Section on Research, Asilomar, CA, August, 2009*
- Recovery - *International Stroke Conference (American Heart Association), New Orleans, LA, February, 2008*
- Imagery and Imaging - *American Physical Therapy Association Combined Sections Meeting, Section on Neurology, San Diego, California, February, 2006.*
- Post-stroke Hemiplegia - *American Physical Therapy Association Combined Sections Meeting, Section on Neurology, San Diego, California, February, 2006.*
- Upper Extremity Motor Control - *Biannual Motor Control Conference, Varna, Bulgaria, September, 2005.*
- Mechanisms of Neural Recovery - *American Physical Therapy Association Combined Sections Meeting, Section on Neurology, Tampa, Florida, February, 2003.*
- Muscle Symposium - *International Society of Biomechanics, Calgary, Alberta, Canada, August, 1999.*

Memberships

- Society for the Neural Control of Movement, 2008 -
- International Society for Posture and Gait, 2006 -
- American Physical Therapy Association, 1990 - present
 - Sections on: Research, Neurology
 - Florida Chapter
- American College of Sports Medicine, 1994 - present
- Society for Neuroscience, 1996 - present
- International Society for Electrophysiology and Kinesiology, 1998 -

Honors & Awards

- Annual Greene Lectureship, Department of Physical Therapy, Springfield College (Massachusetts), 2011
- Clinician Publication Award, California Chapter American Physical Therapy Association, 2007

- Visiting Fellowship, Faculty of Biomedical Kinesiology, Katholike University, Belgium, November, 2006
- Speaker, Department of Veterans Affairs Senior Management Conference, August, 2004
- Honoree, American Physical Therapy Association, Profiles in Excellence, December, 2003
- Advanced Research Career Development Award, 2001 - 2004
 - Rehabilitation Research and Development Service, Department of Veteran's Affairs
- Outstanding Presentation, 2nd National Rehabilitation R&D Service Conference, February, 2000
- John V. Basmajian Student Investigator Award, 1998
 - International Society for Electrophysiology & Kinesiology
- Research Career Development Award, 1998 - 2001
 - Rehabilitation Research and Development Service, Department of Veteran's Affairs
- Boston University Women's Graduate Club Scholarship, 1995
- Department of Veteran's Affairs Health Professions Scholarship, 1990-1992
- Employee Performance Award
 - VA Palo Alto Health Care System - Rehab R&D Center - 1998
 - Boston VA Medical Center - Physical Medicine and Rehabilitation Service - 1994
 - Seattle VA Medical Center - General Medical Research - 1988, 1989, 1990
- Student Advisory Board, Class Representative, 1990-1992
 - Department of Physical Therapy, Sargent College, Boston University

Professional Development Attended

- European Society for Movement Analysis in Adults and Children (ESMAC) Annual Meeting, September, 2009
London, **UNITED KINGDOM**
- Mechanisms Underlying Disordered Movement: Impairments with Force Generation
Research Retreat sponsored by the APTA Section on Research, August 2009
- Canadian Stroke Network Annual Conference, September, 2008
Winnipeg, Manitoba **CANADA**
- Grant Writing Part II: The Workshop Experience, April – August, 2008
Candidacy by competitive selection process, 16 participants University-wide
Stephen W. Russell, Ph.D, through the University of Florida, Office of the Associate Provost for Faculty
Development
- Neural Control of Movement Society, May 2008; May 2010
- VA Health Service Research & Development Service, Annual Meeting, February, 2008
- Intensive Course in Transcranial Magnetic Stimulation
Laboratory for Magnetic Brain Stimulation, Beth Israel-Deaconess Medical Center (A. Pascual-Leone, M.D.,
Ph.D.), September, 2007
- International Society for Posture & Gait Research
University of Vermont, July, 2007; University of Bologna, **ITALY**, 2009
- Building Effective Translational Rehabilitation Research (BETRR) – Translational Research Conference and
Workgroups, University of Florida and VA Brain Rehabilitation Research Center, April, 2007
- International Stroke Conference
American Heart Association/ American Stroke Association, February, 2007, 2008
- UE Translational Research Conference and Workgroups
University of Florida and VA Brain Rehabilitation Research Center, January, 2006
- Write Winning Grants Seminar
Sponsored by University of California, Irvine School of Medicine - Stephen W. Russell, Ph.D. and David C.
Morrison, Ph.D. San Francisco, November, 2005.
- III-STEP (International Summer Institute Translating Evidence into Practice) – Linking Movement Science and
Intervention, sponsored by APTA Sections on Neurology and Pediatrics and NICHD-NIA Conference Grant, Salt
Lake City, Utah, July, 2005
- 3rd Annual Intensive Workshop On Grant Writing, Preparation and Submission in Rehabilitation Research
Sponsored by ERRIS (Enhancing Rehabilitation Research in the South) and the Midwest Medical Rehabilitation
Regional Network, Charlottesville, VA - January, 2005
- Evidence Based Medicine in Neurorehabilitation
3rd Joint Congress of the World Federation for Neurorehabilitation, Zurich, **SWITZERLAND** – October, 2004
- NIH Regional Grant Writing Workshop
California State University Sacramento - September, 2004
- Brain Mapping Workshop
Sponsored by NIH Regional Network, RehabNetWest
University of California Los Angeles - February, 2002
- Current Concepts of Magnetic Resonance Imaging
Offered by the Department of Radiology, Stanford University School of Medicine and the National Center for
Advanced MR Technology at Stanford, September, 2000
- How to Practice Evidence-based Medicine
2nd Rocky Mountain Workshop sponsored by The Colorado Health Outcomes Program and University of
Colorado School of Medicine – August 2000
- PROCID (Prevention of Muscle Disorders in Operation of Computer Input Devices) Symposium
Muscle Disorders in Computer Users: Mechanisms and Models
National Institute of Occupational Health, Copenhagen, **DENMARK**, November, 1999

- VA Epidemiology Summer Session (Epidemiology Research & Information Center/ERIC)
University of Washington and VA Puget Sound Health Care System, June 1999
- Neural Plasticity
Research Retreat Sponsored by the APTA Section on Research, August 1998
- Tenth Annual Interdisciplinary Bobath Symposium in the Treatment of Adult Hemiplegia
San Francisco, CA, April 1998
- Brain Imaging Short Course
Society for Neuroscience Annual Meeting, 1997
- Canadian Society of Biomechanics, Biennial Meeting.
Simon Fraser University, Vancouver, B.C., CANADA August, 1996.
- Sarcopenia and Physical Performance in Old Age
Sponsored by the National Institute on Aging, National Institutes of Health, July 1996
- Society for Neuroscience, Annual Meeting
November 1993, 1995, 1996, 1997, 1998, 2000, 2003, 2004, 2005
- Multisegmental Motor Control: Interface of Biomechanical, Neural, and Behavioral Approaches
Research Retreat Sponsored by the APTA Section on Research, August 1995
- Exercise Neuroscience Group
Ontario, CANADA - August 1995, June 2006
- Stroke Survivors' Conference
Sponsored by Braintree Rehabilitation Hospital/Neurobehavioral Programs, September 1994
- American Physical Therapy Association, Annual Conference, June 1991, 2001, 2006, 2007, 2008
World Congress of Physical Therapy, June 1995
Second Joint APTA/CPA Congress, June 1994
- NDT/Bobath Three Week Course in the Treatment of Adults with Hemiplegia
NDTA Approved Course, Janice B. Hulme, PT, March 1994
- Introduction to NDT: Focus on the Trunk
Janice B. Hulme, PT, presented by In Motion Therapy Services, Cranston, R.I., January 1994.
- EMG: Fine Wire Technique
presented by: The Motion Analysis Laboratory, Children's Hospital, San Diego, CA, October 1993
- NDT Approach to the Orthopaedic and Pain Patient
Terry Wilson, PT, presented by Fallon Clinic, Auburn, MA, September 1993
- American College of Sports Medicine
Annual Conference: May 1993, 1995, 1996, 1998, 2003, 2005
- Grantsmanship -- The Preparation of a Successful Research Grant
Leslie C. Costello, Ph.D., University of Maryland, November 1992
- Interpretation of Gait Analysis Data
The Motion Analysis Laboratory, Children's Hospital, San Diego, California
David Sutherland, M.D., et al, September 1992
- Concepts of Rehabilitation for Adults with Balance Disorders
Lewis Nashner, Sc.D. and Susan L. Whitney, PT
Pre-Conference Instructional Course, Annual Massachusetts Chapter APTA Meeting, October 1991
- Muscle Function in Normal and Pathological States
Research Retreat sponsored by the APTA Section on Research, August 1991
- Balance in the Elderly
Pam Duncan, Ph.D., PT, Course sponsored by the Maine Chapter APTA, June 1991
- Neurobehavioral Bases of Locomotion and Reaching
Annual Conference in Movement Sciences, Teachers' College, Columbia University, March 1991
- Combined Sections Meeting American Physical Therapy Association
(Sections on Research & Neurology) - February, 1991, 1992, 1993, 1994, 1995, 1997, 1998, 1999, 2000, 2001, 2003, 2004, 2005, 2006, 2007, 2008, 2009

- Massachusetts Chapter APTA, Annual Meeting, 1990, 1991
- Functional Electrical Stimulation
Lucinda Baker, Ph.D., PT, Sponsored by REMEC at Seattle VA Medical Center, July 1989