

**EMORY UNIVERSITY SCHOOL OF MEDICINE  
STANDARD CURRICULUM VITAE FORMAT**

Revised: 11/12/2015

1. Name: Michael R. Borich, DPT, PhD
2. Current Titles and Affiliations:
  - a. Academic Appointments:
    1. Primary Appointments:  
Assistant Professor of Rehabilitation Medicine, Division of Physical Therapy, Emory University, School of Medicine; 2014 – Present
    2. Joint and Secondary Appointments:  
Training Faculty, Program in Neuroscience, Graduate Division of Biological and Biomedical Sciences, Emory University, Laney Graduate School; 2014-Present  
  
Adjunct Faculty, Wallace H. Coulter Department of Biomedical Engineering, Georgia Tech College of Engineering and Emory School of Medicine; 2014-Present  
  
Faculty Member, Parker H. Petit Institute for Bioengineering and Bioscience, Georgia Tech, 2015-Present
3. Previous Academic and Professional Appointments:  
  
Instructor in Physical Therapy, Department of Physical Therapy, University of British Columbia; 2012-2013
4. Previous Administrative and/or Clinical Appointments:  
  
Physical Therapist, Hennepin County Medical Center, Minneapolis, MN; 2005-2010
5. Licensures / Boards:  
  
Minnesota Issued 2005  
Georgia Issued 2014
6. Education:  
  
B.S., University of Minnesota-Twin Cities 1998-2002  
D.P.T., University of Minnesota-Twin Cities 2002-2005  
Ph.D., University of Minnesota-Twin Cities; 2006-2010

7. Postgraduate Training:

Postdoctoral Research Fellow in Neuroscience and Rehabilitation, Brain Behaviour Laboratory, University of British Columbia, Vancouver, British Columbia, Canada, Lara A. Boyd, DPT, PhD, 2011-2013

8. Continuing Professional Development Activities:

Piedmont Project XII, Emory University 2015

Emory University School of Medicine Junior Faculty Development Course 2015

Comprehensive Opportunities in Rehabilitation Research Training Retreat 2014, 2015

17<sup>th</sup> EEGLAB Workshop 2013

Training in Grantsmanship in Rehabilitation Research 2013

9. Committee Memberships:

a. Institutional:

Graduate Education Committee, University of British Columbia, Faculty of Medicine, 2012-2013

Health Science Policy and Review Council, University of Minnesota, Graduate School, 2009-2010

10. Peer Review Activities:

a. Grants:

i. National and International:

Reviewer, Medical Research Council, 2015

Review Committee Member, Brain Canada, 2015

Evaluator, European Commission Horizon 2020, 2014-Present

Reviewer, Swiss National Science Foundation, 2014

Reviewer, NIH Center for Scientific Review Early Career Review Program, 2014-Present

Reviewer, Dystonia Medical Research Foundation, 2011, 2012

Reviewer, Dutch Technology Foundation, 2011

b. Manuscripts:

i. National and International:

*Current Biology, 2015-Present*

*Human Brain Mapping, 2015-Present*

*Journal of Neurology, 2015-Present*

*International Journal of Molecular Sciences, 2015-Present*

*Neuromodulation, 2015-Present*

*Journal of the Neurological Sciences, 2015-Present*

*Journal of Neuroscience Methods, 2015-Present*

*European Journal of Neurology, 2015-Present*

*Canadian Journal of Neurologic Sciences, 2015-Present*

*BMC Neurology, 2014-Present*

*Clinical Physiology and Functional Imaging, 2014-Present*

*NeuroImage, 2014-Present*

*Neuropsychologia, 2014-Present*

*Expert Review of Neurotherapeutics, 2014-Present*

*PLOS ONE, 2014-Present*

*Frontiers in Psychology, 2014-Present*

*Archives of Physical Medicine and Rehabilitation, 2014-Present*

*Nature and Science of Sleep, 2013-Present*

*American Journal of Physical Medicine and Rehabilitation, 2013-Present*

*Medicine and Science in Sports and Exercise, 2013-Present*

*Physical Therapy Journal, 2013-Present*

*NeuroImage: Clinical, 2013-Present*

*Restorative Neurology and Neuroscience, 2011-Present*

*Journal of Neurologic Physical Therapy, 2011-Present*

*Movement Disorders, 2009-Present*

*Behavioural Brain Research, 2009-Present*

c. Conference Abstracts:

i. National and International:

American Physical Therapy Association Combined Sections Meeting  
Abstract Reviewer, 2012-Present

Organization for Human Brain Mapping Annual Meeting Abstract  
Reviewer, 2012-Present

11. Consultantships:

Allergan, 2009

## 12. Editorships and Editorial Boards:

Associate Editor, Restorative Neurology and Neuroscience, 2011-Present

## 13. Honors and Awards:

Steer-Johnson Award, University of Minnesota Department of Physiology, 2002  
Barbara Lee Graham Scholarship Recipient, University of Minnesota Program in Physical Therapy, 2004

President's Student Leadership and Service Award Recipient, University of Minnesota, 2005

Mary McMillian Scholarship Recipient, American Physical Therapy Association, 2005

Block Grant Fellow, University of Minnesota, 2008

Doctoral Dissertation Fellow, University of Minnesota, 2009-2010

Neuromuscular Plasticity Symposium Scholar, University of Florida, 2010

Postdoctoral Fellow Travel Award, University of British Columbia, 2012

Research Fellow, Heart and Stroke Foundation of Canada Focus on Stroke, 2012

Rising Star Award, Vancouver Coastal Health Research Institute, 2013

Postdoctoral Trainee Travel Award, Society for Neuroscience Chapter, 2013

Clinical Loan Repayment Awardee, National Institutes of Health, 2014-Present

## 14. Society Memberships:

American Society for Neurorehabilitation, 2015-Present

American Congress of Rehabilitation Medicine, 2012-Present

Organization of Human Brain Mapping, 2012-Present

International White Matter Study Group, 2011-Present

Canadian Stroke Network Trainee Association, 2011-Present

Society for Neuroscience (SFN), 2007-Present

American Physical Therapy Association (APTA), 2002-2010, 2014-Present

APTA Neurology Section, 2004-2005, 2006-2010, 2014-Present

Movement Disorders Society, 2008-2010

## 15. Organization of Conferences:

### a. National and International:

#### i. Administrative Positions:

Organizer, Organization for Human Brain Mapping Postdoctoral Student Social, 2012

## 16. Community Outreach:

a. General:

Preceptor, Emory University Pro Bono Physical Therapy Clinic, Good Samaritan Health Clinic, 2015-Present

Research Update: Brain Behaviour Laboratory. Shaughnessy Stroke Group.  
10/23/2012

b. Media appearances:

Dings in the Brain: What Brain Imaging Can Tell PTs About Concussion. Webinar date: March 31<sup>st</sup>, 2015. Physiotherapy Association of British Columbia.  
<http://bcphysio.org/content/pabc-webinar-dings-brain-what-brain-imaging-can-tell-pts-about-concussion-knowledge-team>

Seeing Concussion. Light Works Exhibition, Royal Photographic Society. London, Belfast, Edinburgh, UK. January 25<sup>th</sup>, 2015-April 17<sup>th</sup>, 2015.  
[rps.org/exhibitions-and-competitions/current-exhibitions/rps-light-works-exhibition/49](http://rps.org/exhibitions-and-competitions/current-exhibitions/rps-light-works-exhibition/49).

Understanding the resilient brain: using advanced neuroimaging technology to measure and modulate brain behavior after injury. Brain Injury Professional Special Issue on Neurotechnology. 2012.  
[http://issuu.com/braininjuryprofessional/docs/bip\\_technology\\_2012](http://issuu.com/braininjuryprofessional/docs/bip_technology_2012)

Decouverte, Radio-Canada. 'Plasticite du cerveau' 04/29/2012. <http://www.radio-canada.ca/emissions/decouverte/2011-2012/Reportage.asp?idDoc=217432&autoPlay=##commenter>

The National. CBC/Radio-Canada. 'The Learning Brain' 05/04/2012.  
[http://www.cbc.ca/video/#/News/TV\\_Shows/The\\_National/1233408557/ID=2231068431](http://www.cbc.ca/video/#/News/TV_Shows/The_National/1233408557/ID=2231068431)

Brain Research Centre Annual Report. 'White Matter Tract Damage Predicts Recovery in Stroke' 2011.

Centre for Brain Health Groundbreaking Ceremony. Presentation to Health Minister of Canada, Health Minister of British Columbia, Federal Minister of Aboriginal Affairs and Northern Development and University of British Columbia President. 10/11/2011.

Global TV. 'Impact of Transient Ischemic Attack on Brain Neurophysiology' 01/23/2011.  
<http://www.globaltvbc.com/video/index.html?categoryid=1050092775>.

17. Formal Teaching:

a. Doctor of Physical Therapy Student Teaching:

Course Instructor and Organizer, Emory University  
DPT805, Principles of Motor Learning, 2014-Present

Course Instructor, Emory University  
DPT735, Neuroscience, 2014

Instructor, University of British Columbia  
Pathology for Physical Therapy II, 2013

Lecturer, University of British Columbia  
Adult Neurology, 2012-2013

Teaching Assistant, University of British Columbia  
Adult Neurology, 2012-2013

Teaching Assistant, University of Minnesota  
Human Gross Anatomy, 2008, 2010  
Clinical Assessment, 2007  
Therapeutic Procedures, 2007  
Neurorehabilitation, 2008-2009  
Pharmacology, 2009

b. Undergraduate Teaching:

Assistant Lab Director, Interdisciplinary Medicine and Biology, University of Minnesota  
Human Anatomy Cadaver Laboratory, 2002-2004

Teaching Assistant, Interdisciplinary Medicine and Biology, University of Minnesota  
Human Anatomy Cadaver Laboratory, 2000-2002

c. Other Categories

Course Instructor, Case Based Examination & Differential Diagnosis,  
Neurological Physical Therapy Professional Education Consortium, 2015

Course Developer, Comprehensive Concussion Management: 'Need to Know';  
Information for Physical Therapists, American Physical Therapy Association  
Neurology Section Continuing Education Course, 2014-Present

Course Developer, Lead Instructor, Neuroanatomy with Clinical Correlations.  
Emory University Continuing Education Course, 2014

Lecturer, Neuroanatomy Review with Clinical Correlation. American Physical

Therapy Association (Minnesota Chapter) Continuing Education Course, 2009.

Lab Instructor, Human Anatomy. American Physical Therapy Association (Minnesota Chapter) Continuing Education Course, 2008.

18. Supervisory Teaching:

a. PhD Students Directly Supervised:

Katie Wadden      2011-2013    Rehabilitation Science,  
University of British Columbia (Faculty Supervisor: Dr. Lara A  
Boyd)

Cameron Mang    2011-2013    Rehabilitation Science,  
University of British Columbia (Faculty Supervisor: Dr. Lara A  
Boyd)

b. Doctor of Physical Therapy Students Directly Supervised

Patrick O'Shea	2015-Present	Emory DPT Program
Aaron Knott	2015-Present	Emory DPT Program
Kendall Wilde	2015-Present	Emory DPT Program
Eric Oetter	2014-Present	Emory DPT Program
Colby Walker	2014-15	Emory DPT Program
Sumire Sato	2014-15	Emory DPT Program
Whitney Gray	2014-2015	Emory DPT Program
Jennifer Smith	2014-15	Emory DPT Program
Collette Wade	2014-15	Emory DPT Program
James Chen	2014-15	Emory DPT Program

c. Post-doctoral Fellows Directly Supervised (Primary Supervisor: Dr. Lara A Boyd)

Whitney Gray, DPT	2015-Present	NIH StrokeNet RCC Fellow
Marjan Zakeri, M.D.	2012-2013	Neuroscience
Bimal Lakhani, PhD	2013	Neuroscience
Angela Auriat, PhD	2013	Neuroscience

d. Master's Students Directly Supervised (Faculty Supervisor: Dr. Lara A Boyd)

Jennifer Ferris	2013	Rehabilitation Science
Paul Jones	2011-2013	Neuroscience
Kate Brown	2011-2013	Rehabilitation Science
Katharine Cheung	2011-2013	Neuroscience
Sonia Brodie	2011-2013	Neuroscience

e. Undergraduate Students Directly Supervised (If not primary, supervisor is listed):

Cassie Fierro	2015-Present
Aanand Patel	2015-Present
Kanchi Patel	2015-Present
Timothy Chen	2015-Present
Arsh Momin	2015-Present
Alex Chen	2015-Present
Christopher Kontogiorghes	2014-2015
Benjamin Chong	2014
Praveena Manogaran (Dr. Tony Traboulsee)	2012-2013
Eric Zhao (Dr. Alex L MacKay)	2012-2013
Kris De Asis (Dr. Lara A Boyd)	2012-2013
Andrej Satara (Dr. Lara A Boyd)	2012
Jacob Jackson (Dr. Lara A Boyd)	2012-2013
Keivan Anbarani (Dr. Lara A Boyd)	2011
Ian Campell (Dr. Lara A Boyd)	2011-2012
Vera Khramova (Dr. Naznin Virji-Babul)	2011
Nadia Makan (Dr. Naznin Virji-Babul)	2011-2012

19. Lectureships, Seminar Invitations, and Visiting Professorships:

a. National and International:

Invited symposium speaker, International Multisensory Research Forum. 'Insights and perspectives on sensory-motor integration' Pisa, IT, June 2015

Invited speaker, American Physical Therapy Association Combined Section Meeting. 'Using neuroimaging to understand the brain after mild traumatic brain injury' Indianapolis, IN, Feb 2015

Invited speaker, Human Brain Physiology and Stimulation Laboratory, Johns Hopkins University. 'Evaluating brain structure and function in chronic stroke using neuroimaging and non-invasive stimulation approaches' Baltimore, MD, Sept 2014

Invited speaker, Human Cortical Physiology and Neurorehabilitation Section, National Institutes of Health. 'Evaluating brain structure and function in chronic stroke using neuroimaging and non-invasive stimulation approaches' Bethesda, MD, Sept 2014

Invited speaker, Schwartz Center for Computational Neuroscience, University of California-San Diego. 'Using concurrent TMS-EEG to characterize brain behavior after stroke' San Diego, CA, Jan 2014



Keynote address, American Congress of Rehabilitation Medicine 2012 Annual Conference: Progress in Rehabilitation Research. 'How can brain imaging and stimulation inform rehabilitation?' Vancouver, BC, Oct 2012

Invited lecture, The Pathophysiology of Traumatic Brain Injury. 'Imaging structural and functional changes in the adolescent brain following concussion' Vancouver, BC, July 2012

b. Regional:

Physical Therapy Association of Georgia Annual Meeting, 'Harnessing the adaptive capacity of the brain for rehabilitation' Calloway Gardens, GA Oct 2015

Georgia Institute of Technology School of Applied Physiology Seminar Series, 'Combining non-invasive neuroimaging and neurostimulation approaches to understand human brain behavior and inform stroke rehabilitation' Atlanta, GA June 2014

Center for Visual and Cognitive Research Seminar Series, Atlanta Veterans Affairs Medical Center. 'Using brain imaging and stimulation to inform stroke rehabilitation' Decatur, GA, Mar 2014

WorkSafeBC 9<sup>th</sup> Annual Health Care Professional Conference. 'How can brain imaging and stimulation inform rehabilitation?' Vancouver, BC, June 2013

c. Institutional:

Georgia Tech College of Engineering and Emory School of Medicine Coulter Department of Biomedical Engineering Invited Talk, 'Using brain imaging and stimulation to inform stroke rehabilitation' Atlanta, GA, April 2014

University of British Columbia Concussion Seminar Series, 'Diffusion tensor imaging of sport related concussion: neural correlates of clinical findings' Vancouver, BC, 2012

University of British Columbia MRI Research Centre Annual Retreat, 'Imaging white matter integrity in stroke' Vancouver, BC, 2011

University of British Columbia Rehabilitation Sciences Research in Progress Series, 'Enhancement of learning: does sleep benefit motor skill memory consolidation?' Vancouver, BC, 2011

University of Minnesota Doctoral Dissertation Fellow Research Showcase, 'Enhancement of learning: does sleep benefit motor skill memory consolidation?' Minneapolis, MN, 2010

University of Minnesota Doctoral Dissertation Fellowship Seminar Series,  
'Enhancement of learning: does sleep benefit motor skill memory consolidation?'  
Minneapolis, MN, 2010

University of Minnesota Program in Physical Therapy Continuing Education  
Lecture Series, 'Sleep and motor learning' Minneapolis, MN, 2009

University of Minnesota Center for Clinical Movement Science, 'Therapeutic  
potential of repeated rTMS in focal hand dystonia' Minneapolis, MN, 2008

20. Abstract Presentations at National/International, Regional, and Institutional  
Conferences (*\*presenting author*):

a. National/International

Virji-Babul N\*, **Borich M**, Makan N, Babul AN, Yuang P, Boyd L. Structural and  
functional changes in the brain following sports related concussion in adolescent  
athletes. 10<sup>th</sup> World Congress on Brain Injury, San Francisco USA 2014

**Borich MR\***, Wadden KP, Boyd LA. Brain structural correlates of motor function  
in chronic stroke. 4<sup>th</sup> Annual Canadian Stroke Congress, Montreal, QC 2013

Brodie SM\*, **Borich MR**, Boyd LA. Impact of 5Hz rTMS is related to volume of  
white matter in the sensory cortex after stroke. 19<sup>th</sup> Annual Meeting of the  
Organization for Human Brain Mapping, Seattle, USA 2013

**Borich MR\***, Mackay AL, Vavasour IM, Boyd LA. In vivo characterization of white  
matter status in chronic stroke. 3<sup>rd</sup> Annual Canadian Stroke Congress, Calgary,  
AB 2012

**Borich MR**, Kimberley TJ. Does repetitive transcranial magnetic stimulation  
(rTMS)-induced inhibition of the primary motor cortex following visuospatial motor  
skill training affect performance? American Physical Therapy Association  
Combined Sections Meeting, San Diego, CA 2010

21. Research Focus:

Research is focused on understanding and harnessing the plastic capacity of the  
human nervous system in health and disease in an effort to improve rehabilitation  
outcomes for individuals with neurologic injury and disease. His research utilizes  
multimodal neuroimaging and neurostimulation techniques to characterize the  
brain structural and functional correlates of neural plasticity associated with  
learning and experience.

## 22. Grant Support:

### a. Active Support:

#### 1. Federally Funded:

K12 Scholar, K12HD055931, National Institutes of Health, *Connecting the dots: characterization of effective cortical connectivity underlying persistent arm dysfunction in chronic stroke*, \$227,553.

PI, R24534HD0508211-11 subaward, National Institutes of Health, *Direct evaluation of cortical reactivity and connectivity in chronic stroke*, \$16,188, 2014-Current

Co-Applicant (PI: Keith McGregor). National Institutes of Health/Veterans Affairs, *ShEEP Equipment Request for Magventure X100 fMRI-TMS System*, \$183,000, 2015.

Co-I (PI: Lara A Boyd), Canadian Institutes of Health Research, *Structural and functional correlates of neuroplastic change associated with stroke*, \$788,230, 2013-Current

#### 2. Institutional Support:

PI, Center for Systems Imaging, *Imaging myelin in the human brain*, \$8,000, 2014-Current

PI, Emory University, *Multimodal characterization of brain behavior*, \$185,000, 2014-Current

### b. Previous Support:

Co-I (PI: Naznin Virji-Babul), Department of Physical Therapy, University of British Columbia, *Sodium MR imaging in concussion*, \$5,000, 2012-2013

Co-I (PI: Teresa J Kimberley), Dystonia Medical Research Foundation, *rTMS in focal hand dystonia*, \$252,875, 2008-2010

Co-I (PI: Teresa J Kimberley), University of Minnesota, *Reproducibility of fMRI in the healthy and stroke population*, \$36,414, 2005-2007

## 23. Bibliography:

### a. Published and Accepted Research Articles (clinical, basic science, other) in

Refereed Journals:

1. Neva J, Lakhani B, Brown KE, Wadden KP, Mang CS, Ledwell NHM, **Borich MR**, Vavasour IM, Laule C, Traboulsee AL, MacKay AL, Boyd LA. Measures of corticospinal excitability are associated with clinical measures of disease state in individuals with multiple sclerosis. *Behavioral Brain Research*. Accepted: 10/05/15.
2. Snow N, Peters S, **Borich MR**, Shirzad N, Boyd LA. A reliability assessment of constrained spherical deconvolution-based diffusion-weighted magnetic resonance imaging in individuals with chronic stroke. *J Neurosci Methods*. 2015; 257: 109-120. PMID: 26434704
3. **Borich MR**, Brodie SM, Gray WA, Ionta S, Boyd LA. Understanding the role of the primary somatosensory cortex: opportunities for rehabilitation. *Neuropsychologia*. DOI: 10.1016/j.neuropsychologia/2015.07.07.
4. **Borich MR**. Visual design: exploring data visualization in neuroimaging. *Journal of Humanities in Rehabilitation*. 2015. Advance online publication. Retrieved from link.
5. Sato S, Bergmann T, **Borich MR**. Opportunities for concurrent transcranial magnetic stimulation and electroencephalography to characterize cortical activity in stroke. *Front Human Neurosci*. 2015, 9:250. DOI: 10.3389/fnhum.2015.00250.
6. Auriat A, **Borich MR**, Snow NJ, Wadden KP, Boyd LA. Comparing a diffusion tensor and non-tensor approach to white matter fiber tractography in chronic stroke. *NeuroImage: Clin*. 2015, 7:771-81. DOI: 10.1016/j.nicl.2015.03.007.
7. Manogaran P, Vavasour I, **Borich MR**, Kolind S, Lange A, Rauscher A, Boyd LA, Li D, Traboulsee A. Cortico-spinal tract integrity measured using transcranial magnetic stimulation and magnetic resonance imaging in neuromyelitis optica and multiple sclerosis. *Mult Scler*. Advance online publication. DOI: 10.1177/1352458515579441.
8. Mang CM, **Borich MR**, Brodie SM, Brown KE, Snow NJ, Boyd LA. Diffusion imaging and transcranial magnetic stimulation assessment of transcallosal pathways in chronic stroke. *Clin Neurophys*. 2015. S1388-2457(15)00004-8. DOI: 10.1016/j.clinph.2014.12.018.
9. **Borich MR**, Neva J, Boyd LA. Evaluation of differences in brain neurophysiology and morphometry associated with hand function in individuals with chronic stroke. *Restor Neurol Neurosci*. 2015, 33(1):31-42. DOI: 10.3233/RNN-140425.

10. Chisholm A, Peters S, **Borich MR**, Boyd LA, Lam T. Short-term cortical plasticity associated with feedback-error learning after locomotor training in an individual with incomplete spinal cord injury. *Phys Ther.* 2015, 95(2):257-66. DOI: 10.2522/ptj.20130522.
11. Kimberley TJ, **Borich MR**, Gillick B, Schmidt R, Carey JR. Focal hand dystonia: individualized intervention with repeated application of repetitive transcranial magnetic stimulation. *Arch Phys Med Rehabil.* 2015, 96(4 Suppl):S122-8. DOI: 10.1016/j.apmr.2014.07.426.
12. Brodie SM, **Borich MR**, Boyd LA. Impact of 5Hz rTMS over the primary sensory cortex is related to white matter volume in individuals with stroke. *Eur J Neurosci.* 2014; 40(9):3405-12. DOI: 10.1111/ejn.12717.
13. **Borich MR**, Babul A, Yuan PH, Boyd LA, Virji-Babul N. Alterations in resting state brain networks in concussed adolescent athletes. *J Neurotraum.* 2015, 32(4):265-71. DOI: 10.1089/neu.2013.3269.
14. Brodie S, Villamayor A, **Borich MR**, Boyd LA. Exploring the specific time course of interhemispheric inhibition between the human primary sensory cortices. *J Neurophysiol.* 2014 112(6):1470-6. DOI: 10.1152/jn.00074.2014.
15. Brodie S, Meehan S, **Borich MR**, Boyd LA. 5 Hz repetitive transcranial magnetic stimulation over the ipsilesional sensory cortex enhances motor learning after stroke. *Front Hum Neurosci.* 2014, 8:143.
16. **Borich MR**, Brown KE, Boyd LA. Motor skill learning depends on white matter structural integrity in individuals with chronic stroke. *J Neurol Phys Ther.* 2014, 38(3):151-60.
17. Edwards JE, Meehan SK, **Borich MR**, Linsdell M, Anbarani K, Jones P, Boyd LA. Changes in intracortical excitability in chronic ischemic stroke: more than just altered intracortical inhibition. *Restor Neurol Neurosci.* 2013, 31(6):693-705.
18. Kimberley TJ, **Borich MR**, Siebner HR. Multiple sessions of low-frequency repetitive transcranial magnetic stimulation in focal hand dystonia: clinical and physiological effects. *Restor Neurol Neurosci.* 2013, 31(5):533-542.
19. **Borich MR**, Boyd LA, Makan N, Virji-Babul N. Combining whole brain voxelwise analysis with in vivo tractography of diffusion behavior following sports related concussion in adolescents: A preliminary report. *J Neurotraum.* 2013, 30:1243-49.

20. **Borich MR**, MacKay AL, Vavasour IM, Rauscher A, Boyd LA. Evaluating white matter myelin water fraction in chronic stroke. *NeuroImage: Clinical*. 2013, 2;569-80.
21. Virji-Babul N, **Borich MR**, Makan N, Moore T, Frew K, Emery C, Boyd LA. Diffusion tensor imaging of sports-related concussion in adolescents. *Pediatr Neurol*. 2013, 48(1):24-29.
22. **Borich MR**, Mang C, Boyd LA. Both projection and commissural pathways are disrupted in individuals with chronic stroke: investigating microstructural white matter correlates of motor recovery. *BMC Neurosci*. 2012, 13(1):107.
23. **Borich MR**, Kimberley TJ. Using actigraphy and transcranial magnetic stimulation to assess the relationship between sleep and visuomotor skill learning. *Restor Neurol Neurosci*. 2012, 30(2):81-90.
24. **Borich MR**, Wadden K, Boyd LA. Establishing the reproducibility of two approaches to quantify white matter tract integrity in stroke. *Neuroimage*. 2012, 59(3):2393-400.
25. **Borich MR**, Kimberley TJ. Both sleep and wakefulness support consolidation of continuous, goal-directed, motor skill. *Exp Brain Res*. 2011, 214(4):619-30.
26. **Borich MR**, Holsman III D, Furlong M, Kimberley TJ. Goal-directed visuomotor skill learning: off-line enhancement and the importance of the primary motor cortex. *Restor Neurol Neurosci*. 2011, 29(2):105-113.
27. Kimberley TJ, **Borich MR**, Prochaska KD, Mundfrom SL, Perkins AE, Poepping JM. Establishing the definition and inter-rater reliability of cortical silent period calculation in subjects with focal hand dystonia and healthy controls. *Neurosci Lett*. 2009, 464(2):84-7.
28. **Borich M**, Arora S, Kimberley TJ. Lasting effects of repeated rTMS application in focal hand dystonia. *Restor Neurol Neurosci*. 2009, 27(1):55-65.
29. Kimberley TJ, Khandekar G, **Borich MR**. fMRI reliability in subjects with stroke. 2008, *Exp Brain Res*. 86(1):183-90.
30. **Borich MR**, Bright JM, Lorello DJ, Cieminski CJ, Ludewig PL. Scapular motion in cases of glenohumeral internal rotation tightness. *J Orthop Sports Phys Ther*. 2006, 36(12):926-934.

b. Manuscripts Submitted:

1. Ackerley R, **Borich MR**, Oddo C, Ionta S. Insights and perspectives on sensory-motor integration and rehabilitation. *Multisens Res*. Submitted: 11/02/15.
  2. **Borich MR**, Brodie SM, Lakhani B, Boyd LA. Evaluating interhemispheric cortical responses to transcranial magnetic stimulation in chronic stroke: A TMS-EEG investigation. *Neural Plasticity*. Submitted: 07/31/15.
  3. Lakhani B, **Borich MR**, Jackson JN, Wadden KP, Peters S, Villamayor A, MacKay A, Vavasour M, Rauscher A, Boyd LA. Motor skill acquisition promotes human brain myelin plasticity. *Proceedings of the National Academy of Sciences*. Submitted: 07/02/15.
  4. Zhao E, Vavasour I, Zakeri M, **Borich MR**, Laule C, Rauscher A, Traboulsee A, Li D, Boyd LA, MacKay A. Corpus callosal myelin water fraction and transcallosal inhibition in multiple sclerosis. *J Neurosci*. Submitted: 10/28/14.
- a. Review Articles:
1. **Borich MR**, Brown KE, Lakhani B, Boyd LA. Applications of encephalography to characterize brain activity: perspectives in stroke. *J Neurol Phys Ther*. 2015, 39(1):43-51. DOI: 10.1097/NPT.0000000000000072.
  2. **Borich MR**, Cheung K, Jones P, Khramova V, Gavriloff L, Boyd LA, Virji-Babul N. Concussion: current concepts in diagnosis and management. *J Neurol Phys Ther*. 2013 37(3):133-39.
- b. Book Chapters:
1. **Borich MR**, Boyd LA. Impaired multidimensional motor sequence learning. In *Encyclopedia of the Sciences of Learning* (Ed. Seel N). Springer, 2012.
  2. Wadden K, **Borich M**, Boyd L. Motor skill learning and its neurophysiology. In (Eds. Hodges NJ, Williams AM), *Skill Acquisition in Sport: Research, Theory and Practice* (2<sup>nd</sup> ed.). London: Routledge Publishers, 2012.
- c. Published or In-press Refereed Abstracts (\*presenting author) (out of 51 since 2006):
1. **Borich MR**, Wheaton LA, Brodie SM, Lakhani B, Boyd LA. Increased interhemispheric coherence during transcallosal inhibition assessment in chronic stroke: a preliminary TMS-EEG investigation. *American Society for Neurorehabilitation, Chicago, USA, 15-16 October 2015*.

2. Lakhani B, **Borich MR**, Jackson JN, Wadden KP, Peters S, Villamayor A, MacKay AL, Vavasour IM, Rauscher A, Boyd LA. Multimodal imaging to assess structural and functional changes associated with motor skill acquisition in healthy adults. Society for Neuroscience Annual Meeting, Chicago, USA, 17-21 October 2015.
3. **Borich MR**, Wheaton LA, Brodie SM, Lakhani B, Boyd LA. Increased interhemispheric coherence during transcallosal inhibition assessment in chronic stroke: a preliminary TMS-EEG investigation. American Society for Neurorehabilitation, Chicago, USA, 15-16 October 2015.
4. Lakhani B, **Borich MR**, Jackson JN, Wadden KP, Peters S, Villamayor A, MacKay AL, Vavasour IM, Rauscher A, Boyd LA. Motor skill acquisition promotes human brain myelin plasticity. *Organization for Human Brain Mapping Annual Meeting*, Honolulu, USA, 13-18 June 2015.
5. Ferris JK, Wadden KP, Brown KE, Mang CS, **Borich MR**, Meehan SK, Boyd LA. Relationship of cerebral metabolites with motor performance in chronic stroke and type-2 diabetes. Organization for Human Brain Mapping Annual Meeting, Honolulu, USA, 13-18 June 2015.
6. **Borich MR**, Wheaton LA, Brodie SM, Lakhani B, Boyd LA. Evaluation of interhemispheric connectivity in chronic stroke using TMS-EEG. 3rd Annual Minnesota Neuromodulation Symposium, Minneapolis, Minnesota, USA, April 16th-17th, 2015.
7. **Borich MR\***, Brodie SM, Lakhani B, Boyd LA. Simultaneous TMS-EEG to assess transcallosal inhibition in chronic stroke. Society for Neuroscience Annual Meeting, Washington D.C. 2014
8. Neva JL\*, Brown KE, Wadden KP, Mang CS, Lakhani B, **Borich MR**, Meehan SK, Boyd LA. Continuous theta burst stimulation over contralesional motor cortex enhances paretic arm function associated with motor skill learning after stroke. Canada Stroke Congress, Vancouver, B.C., Canada 2014.
9. Brown, KE\*, Mang CS, Wadden KP, Neva JL, **Borich MR**, Meehan SK, Boyd LA. Influence of continuous theta burst stimulation (cTBS) and short-term training on cortical excitability in learners and non-learners with chronic stroke. Society for Neuroscience, Washington D.C., 2014.
10. Ferris J\*, Brown KE, Mang CS, Wadden KP, **Borich MR**, Meehan SK, Boyd LA. Altered intracortical excitability and cerebral metabolic changes in chronic stroke: preliminary analysis. Society for Neuroscience, Washington D.C., 2014
11. Jackson JN\*, **Borich MR**, Noble JW, Boyd LA. Characterizing the relationship between myelin content and paretic extremity use in the chronic stage of stroke recovery. 5<sup>th</sup> Annual Canadian Stroke Congress, Vancouver, Canada 2014.
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13. Mang CS, **Borich MR**, Brodie SM, Snow NJ, Boyd LA. Structure and function of transcallosal pathways is related to motor impairment in chronic stroke. 20<sup>th</sup> Annual Meeting of the Organization for Human Brain Mapping, Hamburg, Germany, 2014.
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16. **Borich MR\***, Dao E, Edwards JD, Meehan SK, Boyd LA. Evaluation the relationships between hand function with measures of brain structure and function in chronic stroke. Society for Neuroscience Annual Meeting, San Diego, CA 2013.
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