

Andrew C. Smith, PT, DPT, PhD
University of Colorado School of Medicine
Department of Physical Medicine and Rehabilitation
Physical Therapy Program
Anschutz Medical Campus
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Education:

Northwestern University, Chicago & Evanston, IL	Doctor of Philosophy, Neuroscience Specialization: Human Movement and Rehabilitation Sciences	2012 - 2016
Northwestern University	Searle Center Teaching Certificate	2015
University of Washington, Seattle, WA	Doctor of Physical Therapy	2005 – 2008
University of Washington, Seattle, WA	Bachelor of Arts. Major: Psychology	2001 - 2005

Licensure Information:

Colorado #PTL.00014215

Employment and Positions Held:

2020 – present	Assistant Professor, University of Colorado School of Medicine PM&R, Anschutz Medical Campus, Aurora, CO
2016 – 2020	Assistant Professor, Regis University School of Physical Therapy, Denver, CO
2013 – 2016	PhD thesis work, Neuromuscular Imaging and Research Laboratory, Northwestern University Physical Therapy and Human Movement Sciences department, Chicago, IL
2012 – 2016	Per Diem Physical Therapist, Rehabilitation Institute of Chicago, Chicago, IL
2012 – 2013	Systems Neuroscience Laboratory rotations, Northwestern University Physical Therapy and Human Movement Sciences department, Chicago, IL
2010 – 2012	Research Physical Therapist, Rehabilitation Institute of Chicago, Sensory Motor Performance Program, Chicago, IL
2011 – 2012	Clinical Physical Therapist, Rehabilitation Institute of Chicago, Inpatient Spinal Cord Injury Unity, Chicago, IL
2009 – 2010	Outpatient Physical Therapist, Harborview Medical Center, Seattle, WA

- 2009 Staff Physical Therapist, Infinity Rehab, Seattle Keiro and Washington Care Center, Seattle, WA
- 2008 – 2009 Lead Physical Therapist, Infinity Rehab, Sullivan Park Care Center, Spokane, WA
- 2005 – 2007 Part-time Staff member, Underserved Youth Outreach, Beacon Hill Young Life, Seattle WA

Teaching Experience:

- 2020 – present Assistant Professor, University of Colorado Physical Therapy Program - Neuroscience
- 2016 – 2020 Assistant Professor, Regis University School of Physical Therapy – Neuroscience, Gross Anatomy, Evidence-Based Practice, Kinesiology, and Problem-Based Learning courses
- 2014 – 2016 Instructor and Lecturer, Northwestern University Doctor of Physical Therapy Program Neuroscience courses
- 2014 – 2016 Instructor, Northwestern University Doctor of Physical Therapy Program Doctoral Student Research Synthesis course
- 2014 – 2015 Northwestern University Searle Teaching Certificate Program – this highly competitive program combines seminars, workshops, mentoring, and discipline-specific discussions to prepare participants for future academic teaching responsibilities
- 2009 – present Non-primary Clinical Instructor for Physical Therapy students. Infinity Rehab in Seattle Washington, Harborview Medical Center, University of Washington, and Rehabilitation Institute of Chicago.
- 2013, 2014, 2015 Teaching Assistant, Neuroscience I & II, Northwestern University Doctor of Physical Therapy students.
- 2005 Teaching Assistant for undergraduate level Research Methods in Psychology Course. University of Washington.

Peer Reviewed Publications (Pending):

1. Smith AC, Angeli CA, Ugiliweneza B, Weber KA, Negahdar M, Mesbah S, Boakye M, Harkema SJ, Rejc E. Spinal cord imaging markers and recovery of standing with epidural stimulation in individuals with clinically motor complete spinal cord injury. *Experimental Brain Research*. (submitted 7/2021).

2. Tefertiller C, Rozwod M, VandeGriend E, Bartelt P, Sevigny M, Smith AC. Transcutaneous electrical spinal cord stimulation to promote upper and lower extremity recovery in chronic spinal cord injury. *Frontiers in Rehabilitation Sciences*. (submitted 7/2021).

Peer Reviewed Publications:

1. Smith AC, O'Dell DR, Albin SR, Berliner JC, Dungan D, Robinson E, Elliott JM, Carballido-Gamio J, Stevens-Lapsley J, Weber KA. Lateral corticospinal tract and dorsal column damage: predictive relationships with future motor and sensory scores at discharge from acute rehabilitation after spinal cord injury. *Archives of Physical Medicine and Rehabilitation*. 2021. doi: 10.1016/j.apmr.2021.07.792.
2. Berliner JC, O'Dell DR, Albin SR, Dungan D, Sevigny M, Elliott JM, Weber KA, Abdie DR, Anderson JS, Rich AA, Seib CA, Sagan HGS, Smith AC. The influence of conventional T2 MRI indices in predicting who will walk outside one year after spinal cord injury. *Journal of Spinal Cord Medicine*. 2021. doi: 10.1080/10790268.2021.1907676.
3. Weber KA, Abbott R, Bojilov V, Smith AC, Wasielewski M, Hastie TJ, Parrish TB, Mackey S, Elliott JM. Multi-muscle deep learning segmentation to automate the quantification of muscle fat infiltration in cervical spine conditions. *Nature Scientific Reports*. 2021;11,16567. <https://doi.org/10.1038/s41598-021-95972-x>.
4. Smith AC, O'Dell DR, Thornton WA, Dungan D, Robinson E, Thaker A, Gisbert R, Weber KA, Berliner JC, Albin SR. Spinal cord tissue bridges validation study: predictive relationships with sensory scores following cervical spinal cord injury. *Topics in Spinal Cord Injury Rehabilitation* (accepted for publication 7/2021).
5. Smith AC, Albin SR, O'Dell DR, Berliner JC, Dungan D, Sevigny M, Draganich C, Elliott JM, Weber KA. Investigating the relationships of axial MRI biomarkers of spinal cord damage with future walking and motor function. *Spinal Cord*. 2020. doi: 10.1038/s41393-020-00561-w.
6. Rejc E, Smith AC, Weber KA, Ugiliweneza B, Bert RJ, Negahdar M, Boakye M, Harkema SJ, Angeli CA. Spinal cord imaging markers and recovery of volitional leg movement with spinal cord epidural stimulation in individuals with clinically motor complete spinal cord injury. *Frontiers in Systems Neuroscience*. 2020. doi: 10.3389/fnsys.2020.559313.
7. Smith AC, Albin SR, Abbott R, Crawford RJ, Hoggarth MA, Wasielewski M, Elliott JM. Confirming the geography of fatty infiltration in the deep cervical extensor muscles in whiplash recovery. *Nature Scientific Reports*. 10, 11471 (2020). <https://doi.org/10.1038/s41598-020-68452-x>.
8. Elliott JM, Smith AC, Hoggarth MA, Albin SR, Weber KA, Haager M, Fundaun J, Wasielewski M, Courtney DM, Parrish TB. Muscle fat infiltration following whiplash: a computed tomography and magnetic resonance imaging comparison. *PLoS One*. 2020. <https://doi.org/10.1371/journal.pone.0234061>.
9. Smith AC, Rozwod M, Tappan RS, Anderson HR, Sehon TA, Waggoner AJ, Tefertiller C. Transcutaneous spinal cord stimulation for voluntary movement after spinal cord injury: current state

of the research. American Physical Therapy Association Academy of Neurologic Physical Therapy Spinal Cord Injury Special Interest Group. 2020. Neuropt.org.

10. Elliott JM, Heinrichs BE, Walton DM, Parrish TB, Courtney DM, Smith AC, Hunt J, Kwasny MJ, Wasielewski M, Siegmund GP. Motor vehicle crash reconstruction: does it relate to the heterogeneity of whiplash recovery? *PLoS One*. doi:10.1371/journal.pone.0225686. eCollection 2019.
11. Stone DB, Bogaardt H, Linnstaedt SD, Martin-Harris B, Smith AC, Walton DM, Ward E, Elliott JM. Whiplash-associated dysphagia: considerations of potential incidence and mechanisms. *Dysphagia*. 2019. <https://doi.org/10.1007/s00455-019-10039-4>.
12. Smith AC, Tefertiller C, Joyce M, Tappan RS, Lubahn A, Hahn C, Rejc E. Spinal cord epidural stimulation for voluntary movement after spinal cord injury: current state of the research. American Physical Therapy Association Academy of Neurologic Physical Therapy Spinal Cord Injury Special Interest Group. 2019. Neuropt.org.
13. Weber KA, Smith AC, Wasielewski M, Egtesad K, Upadhyayula PA, Wintermark M, Hastie TJ, Parrish TB, Mackey S, Elliott JM. Deep learning convolutional neural networks for the automatic quantification of muscle fat infiltration following whiplash injury. *Nature Scientific Reports*. 2019. <https://doi.org/10.1038/s41598-019-44416-8>.
14. Cummins DP, Connor JR, Heller KA, Hubert JS, Kates MJ, Wisniewski KR, Berliner JC, O'Dell DR, Elliott JM, Weber KA, Smith AC. Establishing the inter-rater reliability of spinal cord damage manual measurement using magnetic resonance imaging. *Spinal Cord Series and Cases*. 2019. <https://doi.org/10.1038/s41394-019-0164-1>.
15. Crawford RJ, Fortin M, Weber KA, Smith AC, Elliott JM. Are MRI technologies crucial to our understanding of spinal conditions? *Journal of Sports and Orthopaedic Physical Therapy*. 2019. DOI: 10.2519/jospt.2019.8793.
16. Albin SR, Koppenhaver SL, Bailey B, Blommel H, Fenter B, Lowrimore C, Smith AC, McPoil TG. The effect of manual therapy on gastrocnemius muscle stiffness in healthy individuals. *The Foot*. 2019. DOI: <https://doi.org/10.1016/j.foot.2019.01.006>.
17. O'Dell DR, Weber KA, Berliner JC, Connor JR, Cummins DP, Heller KA, Hubert JS, Kates MJ, Mendoza KR, Elliott JM, Smith AC. Midsagittal tissue bridges are associated with walking ability in incomplete spinal cord injury: a magnetic resonance imaging case series. *Journal of Spinal Cord Medicine*. 2019. DOI: 10.1080/10790268.2018.1527079.
18. McPherson JG, Smith AC, Duben DA, McMahon KL, Wasielewski M, Parrish TB, Elliott JM. Short- and long-term reproducibility of diffusion-weighted magnetic resonance imaging of lower extremity musculature in asymptomatic individuals and a comparison to individuals with spinal cord injury. *BMC Musculoskeletal Disorders*. 2019. DOI: 0.1186/s12891-018-2361-7.

19. Smith AC. Neuroplasticity of motor pathways. American Physical Therapy Association Academy of Neurologic Physical Therapy Spinal Cord Injury Special Interest Group Fact Sheet. 2018. Neuropt.org.
20. Cloney MB, Smith AC, Coffey T, Paliwal M, Dhaher Y, Parrish TB, Elliott JM, Smith ZA. Fatty infiltration of the cervical multifidus musculature and their clinical correlates in spondylotic myelopathy. *Journal of Clinical Neuroscience*. 2018; S0967-5868(17)31815-5. doi: 10.1016/j.jocn.2018.03.028.
21. Smith AC, Weber KA, O'Dell DR, Parrish TB, Wasielewski M, Elliott JM. Lateral corticospinal tract damage correlates with motor output in incomplete spinal cord injury. *Archives of Physical Medicine and Rehabilitation*. 2018;99(4):660-666.
22. Smith AC, Weber KA, Parrish TB, Hornby TG, Tysseling VM, McPherson JG, Wasielewski M, Elliott JM. Ambulatory function in motor incomplete spinal cord injury: A magnetic resonance imaging study of spinal cord edema and lower extremity muscle morphometry. *Spinal Cord*. 2017;55:672-678.
23. Jakubowski K, Smith AC, Elliott JM, Lee SSM. The relationship between volitional activation and muscle properties in incomplete spinal cord injury. *Topics in Spinal Cord Injury Rehabilitation*. 2017. DOI: <https://doi.org/10.1310/sci17-00007>.
24. Elliott JM, Hancock MJ, Crawford RJ, Smith AC, Walton DM. Advancing imaging technologies for patients with spinal pain: with a focus on whiplash injury. *The Spine Journal*. 2017. DOI: <http://dx.doi.org/10.1016/j.spinee.2017.06.015>.
25. Smith AC, Jakubowski K, Wasielewski M, Lee SSM, Elliott JM. Lower extremity muscle structure in incomplete spinal cord injury: a comparison between ultrasonography and magnetic resonance imaging. *Spinal Cord Series and Cases*. 2017; doi:10.1038/scsandc.2017.4.
26. Smith AC, Knikou M. A review on locomotor training after spinal cord injury: reorganization of spinal neuronal circuits and recovery of motor function. *Neural Plasticity*. 2016:1216258.
27. Smith AC, Knikou M, Yelick KL, Alexander AR, Murnane MM, Kritselis AA, Houmpavlis PJ, McPherson JG, Wasielewski M, Hoggarth MA, Elliott JM. MRI measures of fat infiltration in the lower extremities following motor incomplete spinal cord injury: reliability and potential implications for muscle activation. *Conf Proc IEEE Eng Med Biol Soc*. 2016: 5451-5456.
28. Smith AC, Parrish TB, Hoggarth MA, McPherson JG, Tysseling VM, Wasielewski M, Kim HE, Hornby TG, Elliott JM. Potential associations between chronic whiplash and incomplete spinal cord injury. *Spinal Cord: Series and Cases*. 2015;1:15024. doi:10.1038/scsandc.2015.24.
29. Sions JM, Smith AC, Hicks GE, Elliott JM. Trunk muscle size and composition assessment in older adults with chronic low back pain: An Intra-examiner and Inter-examiner Reliability Study. *Pain Medicine*. 2015;17(8):1436-1446.

30. Knikou M, Smith AC, Mummidisetty CK. Locomotor training improves reciprocal and non-reciprocal inhibitory control of soleus motoneurons in human spinal cord injury. *Journal of Neurophysiology*. 2015;113:2447-2460.
31. Smith AC, Rymer WZ, Knikou M. Locomotor training modifies soleus monosynaptic motoneuron responses in human spinal cord injury. *Experimental Brain Research*. 2015; 233:89-103.
32. Smith AC, Mummidisetty CK, Rymer WZ, Knikou M. Locomotor training alters the behavior of flexor reflexes during walking in human spinal cord injury. *Journal of Neurophysiology*. 2014;112:2164-2175.
33. Smith AC, Parrish TB, Abbott R, Hoggarth MA, Mendoza K, Chen YF, Elliott JM. Muscle-fat magnetic resonance imaging: 1.5 Tesla and 3.0 Tesla versus histology. *Muscle and Nerve*. 2014;50:170-176.
34. Abbott R, Hoggarth MA, Smith AC, Elliott JM. Letter to the Editor regarding: Smuck M, Cristostomo RA, Demirjian R, et al. Morphologic change in the lumbar spine after lumbar medial branch radiofrequency neurotomy: a quantitative radiological study. *The Spine Journal*. 2014;14:1088-1089.
35. Smith AC, Mummidisetty CK, Rymer WZ, Knikou M. Effects of mechanical vibration of the foot sole and ankle tendons on cutaneomuscular responses in man. *Neuroscience Letters*. 2013: 545:123-126.
36. Mummidisetty CK, Smith AC, Knikou M. Modulation of reciprocal and presynaptic Inhibition during robotic assisted stepping in humans. *Clinical Neurophysiology*. 2013; 124:557-564.
37. Hajela N, Mummidisetty CK, Smith AC, Knikou M. Corticospinal reorganization after locomotor training in a person with motor incomplete paraplegia. *BioMed Research International*. 2013. doi:10.1155/2013/516427.
38. Knikou M, Hajela N, Mummidisetty CK, Xiao M, Smith AC. Soleus H-reflex phase dependent modulation is preserved during stepping within a robotic exoskeleton. *Clinical Neurophysiology*. 2011;122: 1396–1404.

Presentations (Platform, Grand Rounds, Invited Lectures):

1. Smith AC, Berliner JC. Academy of Spinal Cord Injury Professionals, Reno, NV USA 2021. Title of talk: "White matter tract imaging following SCI: predictors of future motor and sensory scores." (9/8/21).
2. Smith AC. University of Colorado Department of Physical Medicine and Rehabilitation, Aurora CO, USA 2021. Title of talk: "Pushing protons for prognosis: can MRI improve clinical management of individuals with spinal cord injury?" (5/5/21).
3. Smith AC. University of Colorado Department of Integrated Physiology Colloquium, Boulder CO, USA 2021. Title of talk: "Spinal cord injuries: what can conventional MRI offer us?" (3/22/21).

4. Tefertiller C, Rozwood M, Smith AC. Academy of Spinal Cord Injury Professionals, USA 2020. Title of talk: "Transcutaneous spinal cord stimulation in combination with massed practice training in spinal cord injury." (9/13/20).
5. O' Dell DR, Albin SR, Weber KA, Berliner JC, Sevigny M, Dungan D, Abdie DR, Anderson JS, Rich AA, Seib CA, Skadow HG, Elliott JM, Smith AC. APTA Combined Sections Meeting Academy of Neurologic Physical Therapy Platform Presentation, Denver CO, USA 2020. Title of talk: "Can early MRI measures predict who will walk outside one year after spinal cord injury?" (2/13/19).
6. Smith AC, Hohl K, O'Dell DR, Elliott JM, Kleinschmidt LA, Parra JA, Patel JG, Ninonuevo RA, Reeder AS, Wolff PL, Jayaraman A. APTA Combined Sections Meeting Academy of Neurologic Physical Therapy Platform Presentation, Denver CO, USA 2020. Title of talk: "Do exoskeleton training and FES ameliorate muscle atrophy following acute SCI?" (2/13/19).
7. Smith AC. APTA Colorado Rocky Mountain Annual Conference. Denver, CO USA 2019. Title of talk: "Spinal Cord Injury: a vision for future rehabilitation efforts." (10/11/19).
8. O' Dell DR, Albin SR, Weber KA, Berliner JC, Sevigny M, Dungan D, Abdie DR, Anderson JS, Rich AA, Seib CA, Skadow HG, Elliott JM, Smith AC. APTA Colorado Rocky Mountain Annual Conference. Denver, CO USA 2019. Title of talk: "Can early MRI measures predict who will walk outside one year after spinal cord injury?" (10/11/19).
9. Smith AC, Hohl K, O'Dell DR, Elliott JM, Kleinschmidt LA, Parra JA, Patel JG, Ninonuevo RA, Reeder AS, Wolff PL, Jayaraman A. APTA Colorado Fall Conference. Denver, CO USA 2019. Title of talk: "Do exoskeleton training and FES ameliorate muscle atrophy following acute SCI?" (10/11/19).
10. Smith AC. Shirley Ryan Ability Lab Spinal Cord Injury Symposium. Chicago, IL USA 2019. Title of talk: "Re-imagining the future of SCI care." (6/5/19).
11. Smith AC, Tappan R, O'Dell DR, Weber KA, Abbott R, Hoggarth MA, Elliott JM. APTA Combined Sections Meeting Academy of Neurologic Physical Therapy Educational Session. New Orleans, LA USA 2018. Title of session: "Imaging of spinal trauma: can protons inform prognosis and improve outcomes?" (2/22/18).
12. Smith AC, Weber KA, O'Dell DR, Wasielewski M, Connor JR, Cummins DP, Heller KA, Hubert JS, Kates MJ, Mendoza KR, Elliott JM. APTA Combined Sections Meeting Research Platform Presentation. New Orleans, LA USA 2018. Title of talk: "Lateral corticospinal tract damage analysis in motor incomplete spinal cord injury – its relationship to specific motor deficits." (2/24/18).
13. O'Dell DR, Berliner JC, Elliott JM, Connor JR, Cummins DP, Heller KA, Hubert JS, Kates MJ, Mendoza KR, Smith AC. APTA CO 2017 Rocky Mountain Fall Symposium. Keystone, CO USA 2017. Title of talk: "Sagittal T₂ MRI measures of spinal cord damage in SCI: inter-rater reliability and implications for rehabilitation." (10/6/17).

14. Smith AC, O'Dell DR. Regis University Research and Scholarship Council Celebration of Scholarship and Research. Denver, CO USA 2017. Title of talk: "Can MRI augment the prediction of who will walk again after spinal cord injury?" (4/11/17).
15. Smith AC, Wasielewski M, Alexander A, Houmpavlis P, Kritselis A, Murnane M, Yelick K, Elliott JM. American Physical Therapy Association Combined Sections Meeting Research Platform Presentation. San Antonio, TX USA 2017. Title of talk: "Does spinal cord edema relate to ambulatory function in motor incomplete spinal cord injury?" (2/18/17).
16. Smith AC. Rehabilitation Institute of Chicago's Spinal Cord Injury Symposium. Chicago, IL USA 2016. Title of talk: "Walking after SCI: mechanisms and prediction." (6/3/16).
17. Smith AC, Parrish TB, Hoggarth MA, McPherson JG, Tysseling VM, Wasielewski M, Kim HE, Hornby TG, Elliott JM. American Physical Therapy Association Combined Sections Meeting Orthopedic Platform Presentation. Anaheim, CA USA 2016. Title of talk: "Minor" whiplash injuries...could they involve the spinal cord?" (2/18/16).
18. Smith AC. Northwestern University Department of Physical Therapy and Human Movement Sciences Grand Rounds seminar. Chicago, IL USA 2015. Title of talk: "Potential associations between chronic whiplash and incomplete spinal cord injury" (8/12/15).

Presentations (Abstract & Poster):

1. Smith AC, Albin SR, Wasielewski M, McPherson JG, Kim HE, Hoggarth MA, Hornby TG, Elliott JM. Incidence of reductions in leg muscle activation in severe whiplash associated disorders. APTA Combined Sections Meeting, Denver CO, USA 2020.
2. Smith AC, Weber KA, Wasielewski M, Elliott JM. Machine learning to automatically measure muscle fat infiltration of the deep cervical spine extensors following whiplash injury. APTA Combined Sections Meeting, Denver CO, USA 2020.
3. Cummins DP, Berliner JC, Connor JR, Heller KA, Hubert JS, Kates MJ, Mendoza KR, O'Dell DR, Elliott JM, Smith AC. Are we close enough? Establishing the inter-rater reliability of spinal cord damage manual-measurement using MRI. APTA Combined Sections Meeting, Washington DC, USA 2019.
4. O'Dell DR, Weber KA, Berliner JC, Elliott JM, Connor JR, Cummins DP, Heller KA, Hubert JS, Kates MJ, Mendoza KR, Smith AC. Spared neural tissue is associated with ambulatory function following spinal cord injury: a magnetic resonance imaging study of midsagittal tissue bridges. APTA Combined Sections Meeting, Washington DC, USA 2019.
5. Passarelli C, Noteboom T, Thomas S, Backward C, Smith AC. Impact of a student profile blog on prospective applicants' decisions on DPT program. APTA Combined Sections Meeting, New Orleans, LA, USA 2018.
6. Smith AC, McPherson JG, Parrish TB, Wasielewski M, Elliott JM. Spinal cord injury edema volume: a potential marker for correlating with walking ability. Society for Brain Mapping and Therapeutics. Miami, FL USA 2016.

7. Smith AC, Parrish TB, Hoggarth MA, Wasielewski M, Kim HE, Hornby TG, Elliott JM. The spinal cord lesion: relationship to muscle changes and motor deficits. Society for Neuroscience Conference, Chicago, IL USA 2015.
8. Smith AC, Parrish TB, Wasielewski M, Kim HE, Hornby TG, Elliott JM. Spinal cord & muscle imaging, motor control, and function following incomplete spinal cord injury. APTA Combined Sections Meeting, Indianapolis, IN, USA 2015.
9. Smith AC, Parrish TB, Wasielewski M, Kim HE, Hornby TG, Elliott JM. Spinal cord motor tract integrity, muscle architectural alterations, and volitional motor control following motor incomplete spinal cord injury. Society for Neuroscience Conference, Washington DC, USA, 2014.
10. Smith AC, Parrish TB, Wasielewski M, Kim HE, Hornby TG, Elliott JM. Muscle architectural alterations and volitional motor control in chronic whiplash and incomplete spinal cord injury. Northwestern University Movement and Rehabilitation Sciences Training Day, Chicago IL, USA, 2014.
11. Smith AC, Parrish TB, Abbott R, Hoggarth MA, Mendoza K, Chen YF, Elliott JM. Measuring skeletal muscle and relative fat-to-water percentage: the comparison of MR Imaging versus histology. APTA Combined Sections Meeting, Las Vegas, Nevada, USA, 2014.
12. Smith AC, Rymer WZ, Mummidisetty CK, Knikou M. The effects of foot and ankle tendon vibration on the non-nociceptive tibialis anterior flexion reflex in man. NUIN Recruitment Event. Chicago IL, USA 2013.
13. Knikou M, Hajela N, Smith AC, Mummidisetty CK, Rymer WZ. Reorganization of Spinal Neural Circuits after Locomotor Training in Human Spinal Cord Injury. APTA Combined Sections Meeting, Chicago, IL, USA, 2012.
14. Smith AC, Mummidisetty CK, Hajela N, Xiao M, Knikou M. On the behavior of human spinal reflex circuits during robotic assisted stepping. APTA Annual Conference, National Harbor, MD, USA, 2011.

Abstracts:

1. Stone DB, Bogaardt H, Ward E, Smith AC, Elliott JM. Oropharyngeal volume and self-reported dysphagia following whiplash injury. Dysphagia Research Society. San Juan Puerto Rico. March 2020.
2. Elliott JM, Heinrichs BE, Walton DM, Parrish TB, Courtney DM, Smith AC, Kwasny MJ, Wasielewski M, Siegmund GP. Motor vehicle crash reconstruction: does it relate to the heterogeneity of whiplash recovery? APTA Combined Sections Meeting, Denver, CO, USA 2020.
3. Weber KA, Smith AC, Wasielewski M, Eghtesad K, Upadhyayula PA, Wintermark M, Hastie TJ, Parrish TB, Mackey S, Elliott JM. Deep learning segmentation and automatic muscle fat infiltration calculation of the deep cervical spine extensors: implications for whiplash...and beyond. Spine Society of Australia. April 2019.

4. Stone DB, Elliott JM, Linnstaedt SD, Martin-Harris B, Smith AC, Walton DM. Mechanisms of perceived swallow change post whiplash: potential for a muscle tension component? Dysphagia Research Society. March 2019.
5. Weber KA, Smith AC, Upadhyayula PA, Wintermark M, Hastie TJ, Elliott JM, Mackey S. Can deeper learn algorithms inform future ambulation status following incomplete spinal cord injury? An application of the convolutional neural network. University of Sydney Brain and Mind Centre Symposium. Sydney, Australia 2018.
6. Cloney MB, Smith AC, Coffey T, Paliwal M, Dhaher Y, Parrish T, Elliott T, Smith ZA. Fatty infiltration of the cervical multifidus musculature is associated with clinical disability in cervical spondylotic myelopathy: a prospective case-controlled series. AANS/CNS Spine Section. Orlando, Florida, Oral Podium, March 2018.
7. Weber KA, Smith AC, Upadhyayula PA, Wintermark M, Hastie TJ, Mackey S. Segmentation of spinal cord injury damage using 3D T₂-weighted MRI and convolutional neural networks. Organization for Human Brain Mapping Annual Meeting. Suntec, Singapore 2018.
8. Footer C, MacDonald CM, Smith AC, Smith MB. Finding the perfect match: revamping a DPT interview process. APTA Educational Leadership Conference. Columbus, Ohio USA 2017.
9. Cloney MB, Smith AC, Wu M, Coffey T, Dhaher Y, Parrish TB, Elliott JM, Smith ZA. Cervical myelopathy predicts fatty infiltration of the multifidus in cervical spondylotic myelopathy (CSM): A prospective, case-controlled radiographic study. Eurospine. Dublin, Ireland 2017.
10. Yelick K, Alexander A, Murnane M, Kritselis A, Houmpavalis P, Hoggarth MA, Smith AC, Elliott JM. The precision of MRI for the quantification of fat infiltration in muscle following spinal cord injury. APTA Combined Sections Meeting. Anaheim, CA USA 2016.
11. Knikou M, Smith AC, Rymer WZ. Locomotor training modifies soleus motoneuron excitability in human spinal cord injury. Society for Neuroscience Conference, Washington DC, USA, 2014.
12. Knikou M, Mummidisetty CK, Smith AC. Locomotor training after spinal cord injury in humans potentiates activity of spinal inhibitory circuitry. Society for Neuroscience Conference, San Diego, CA, USA. 2013.
13. Mummidisetty CK, Smith AC, Rymer WZ, Knikou M. Functional Reorganization of Neuronal Networks after Locomotor Training in Human Spinal Cord Injury. Society for the Neural Control of Movement, San Juan, Puerto Rico, 2013.
14. Knikou M, Hajela N, Smith AC, Mummidisetty CK, Rymer WZ. Selective spinal plasticity after locomotor training in human spinal cord injury. Society for Neuroscience Conference, Washington DC, USA. 2011.
15. Hajela N, Smith AC, Mummidisetty CK, Rymer WZ, Knikou M. Reorganization of Spinal Neuronal Networks after Locomotor Training in Human Spinal Cord Injury. International Neurorehabilitation Symposium, Zurich, Switzerland, 2011.

Funded/In Review Grant Activity:

Ongoing Support

K12 HD055931 Smith (CORRT Scholar), Mueller (PI) 09/2021-08/2022

Improving mechanistic understanding of responsiveness to spinal cord stimulation after spinal cord injury.

This study aims to use neuroimaging biomarkers to investigate mechanisms underlying both epidural and transcutaneous spinal cord stimulation and assist in predicting which individuals will optimally respond to spinal cord stimulation following spinal cord injury.

Role: K12 scholar

AB Nexus Seed Grant Smith and Tan (Co-PIs) 06/2021-05/2022

Acute intermittent hypoxia in persons with spinal cord injury: studying corticospinal drive and motor adaptation.

This study aims to investigate mechanisms by which acute intermittent hypoxia induces improvements in gait ability in participants with motor incomplete spinal cord injury. Specifically, corticospinal drive and motor adaptation will be studied.

Role: Principal Investigator

CU PM&R Pilot Grant Smith (PI) 11/2020-10/2021

Machine learning to quantify muscle changes, lean body mass, and function in obese adults.

This study proposes the use of collected MRIs of thigh musculature to create a convolutional neural network that will rapidly measure muscle cross-sectional area and muscle fat infiltration and also predict lean body mass (verified using DXA) and knee extensor function (verified using knee extensor torques), in obese adults.

Role: Principal Investigator

Completed Support

R03 HD094577 Smith (PI) 02/2019-01/2021

MRI and machine learning to improve early prognosis and clinical management after spinal cord injury.

This study aims to investigate the prognostic potential and clinical utility of advanced MR imaging for early prognosis and management of individuals following spinal cord injury.

Role: Principal Investigator

R01 HD079076 Elliott (PI) 06/2016-05/2019

Neuromuscular Mechanisms Underlying Poor Recovery from Whiplash

This study proposes to explore the use of advanced magnetic resonance imaging applications for early detection of whole-body muscle degeneration and altered spinal cord anatomy in whiplash.

Role: Co-Investigator

Regis University Research and Scholarship Council Smith (PI) 04/2018-04/2019

MRI to improve early prognosis and clinical management after spinal cord injury.

This study aims to investigate the prognostic potential and clinical utility of advanced MR imaging for early prognosis and management of individuals following spinal cord injury.

Role: Principal Investigator

NIH Loan Repayment Program Smith (PI) 08/2015-08/2017

Cord Integrity, Muscle Changes, and Motor Control Following Traumatic Spinal Injury

This study aims to elucidate the relationships of and prognostic value for the 1) magnitude of damage to descending white matter pathways in the cervical spinal cord with MRI, 2) temporal expression of muscle fatty infiltration (MFI) in the extremities, and 3) maximal volitional motor control of the lower extremity. Specifically, the populations of healthy controls, chronic whiplash, and iSCI are being investigated.

Role: Principal Investigator / Clinical Researcher

T32 HD057845 Dewald (PI) 06/2014-06/2016

Training Grant – Neurobiology of Movement and Rehabilitation Sciences

The mission of this program is to train students with clinical and life/applied science backgrounds to become rehabilitation scientists in basic, translational or clinical research. The training program focuses on the neurobiology of movement and rehabilitation sciences, with three main goals: 1) understanding the neurobiology of movement behavior and disorders, 2) identifying and addressing the need for quantitative methods, 3) applying this knowledge to the development of effective rehabilitation interventions.

Role: PhD Candidate Trainee

C023690 (NYSDOH) & 83607 (Craig H. Neilsen Foundation) Knikou (PI) 06/2008-09/2012

Mechanisms Underlying Locomotor Recovery after Step training in SCI.

The purpose of this project was to establish the mechanisms and the changes of specific spinal neuronal pathways underlying recovery of walking and sensorimotor function following intensive treadmill training in people with a spinal cord injury.

Role: Research Physical Therapist

Membership in Scientific/Professional Organizations:

Review Editor in Spinal Cord Medicine and Neurorehabilitation, *Frontiers in Neurology* (2017 – Present)

Colorado RSVP Clinic Research Board Member (2018 – Present)

Colorado RSVP Clinic Executive Leadership Board Member (2021 – Present)

APTA Academy of Orthopaedic PT Imaging Special Interest Group Mentor for MRI/CT of the cervical spine (2017 – Present)

APTA Academy of Neurologic PT Spinal Cord Injury Special Interest Group Member (2018 – Present)

Society for Neuroscience Member (2014 – 2016)

American Physical Therapy Association Member (2005 – Present)

IEEE Engineering in Medicine and Biology Society Member (2015 – 2016)

International Spinal Cord Society – Physiotherapy management of spinal cord injuries (Certificate 2016)

Consultative and Advisory Positions Held:

PTWA Cultural Competence Task Force Chair – created and served as the head of a group of 15 physical therapists with a common mission to encourage increased diversity and cultural competence within PT in the state of Washington (2009 – 2010).

Manuscript Reviewer (ongoing). *Spinal Cord, Journal of Spinal Cord Medicine, Physiotherapy Theory and Practice, Disability and Rehabilitation, Spinal Cord Series and Cases, Clinical Physiology and Functional Imaging, Musculoskeletal Science and Practice – formerly Manual Therapy, Neurotherapeutics, Transactions on Neural Systems and Rehabilitation Engineering, Journal of Neurotrauma, Frontiers Systems Neuroscience, Physiological Reports, Journal of Applied Biomechanics, Annals of Clinical and Translational Neurology, BMC Musculoskeletal Disorders, Journal of Magnetic Resonance Imaging.*

Community Service:

2010 – 2012 Lincoln Park Community Shelter Job Coach – volunteered through a local Chicago homeless shelter as a mentor for young adults seeking employment.

Services to Students and the University, RHCHP College of Health Professions, Regis University, Denver, CO:

2020 Council for Research and Scholarship Grant Panel Discussion, Regis University, Denver, CO

2019 – 2020 Educational Technology Committee, RHCHP College of Health Professions Chair

2018 – 2019 Educational Technology Committee, RHCHP College of Health Professionals, Member and Chair Elect

2017 – 2020 Research Committee, School of Physical Therapy, Member

2017 – 2020 DPT Student Research Groups, School of Physical Therapy, Advisor

2017 – 2020 Research Celebration Planning, School of Physical Therapy, Director

2016 – 2020 Evidence-Based Practice Task Force, School of Physical Therapy, Member

2016 – 2020 Student Advising, School of Physical Therapy, Advisor

2016 – 2020 Student Clinical Experiences, School of Physical Therapy, Faculty Preceptor

2016 – 2020 Social Media Task Force, School of Physical Therapy

2016 – 2018 Global Health Committee, School of Physical Therapy, Member

2017 Search Committee for Regis University School of Physical Therapy, Administrative Assistant Position, School of Physical Therapy, Member

- 2016 – 2017 Admissions Task Force, School of Physical Therapy, Member
- 2016 Interviewer for Director of Center for Research and Scholarship Engagement, Regis University, Interviewer
- 2016 Search Committee for Regis University School of Physical Therapy Junior Faculty Position, School of Physical Therapy, Member

Services to the University/College/School on Committees/Councils/Commissions, Physical Therapy Program, School of Medicine, University of Colorado Anschutz Medical Campus, Denver, CO:

- 2020 – present CU PT Diversity Equity Inclusion Committee, Member
- 2020 – present CU Rehabilitation Sciences PhD Program Committee, Member
- 2020 – present CU PT Scholarship and Awards Committee, Member
- 2020 – present CU PT Faculty Awards Subcommittee, Chair

Honors, Awards and Recognition:

- 2019 – 2021, NIH R03 Grant, NCMRR Early Career Investigator Award
Eunice Kennedy Shriver National Institute of Child Health and Human Development. Grant Number R03HD094577, “MRI and machine learning to improve early prognosis and clinical management after spinal cord injury.”
- 2020 Regis University Rueckert Hartman College of Health Professions Junior Faculty Teaching Award
Awarded annually to one faculty member who displayed exemplary teaching. Involves a peer-nomination and competitive College of Health Professions Awards Committee selection process.
- 2019 Regis University School of Physical Therapy Excellence in Teaching Award
Awarded annually to one faculty member who displayed exemplary teaching, selected by the graduating DPT class.
- 2018 – 2019, Regis University Research and Scholarship Council
Faculty grant, awarded to internal applicants in a competitive application process.
- 2015 – 2017, NIH/National Institute of Neurological Disorders and Stroke
National Institutes of Health Extramural Loan Repayment Program for Clinical Research.
- 2015 Foundation for Physical Therapy Mary Lou Barnes Award
Awarded due to the outstanding PODS II application in postprofessional studies within neurology.
- 2015 Foundation for Physical Therapy Promotion of Doctoral Studies II Award Recipient
Awarded to select physical therapist PhD candidates with the intent of developing independent researchers who will add to or refine the body of knowledge on which physical therapist practice is based.

2014 Foundation for Physical Therapy Promotion of Doctoral Studies I Award Recipient

Awarded to select physical therapist graduate students with the intent of developing doctorally prepared researchers who will add to or refine the body of knowledge on which physical therapist practice is based.

2014 – 2016, NIH/National Institute Of Child Health & Human Development T32 Training Grant

Awarded to select neuroscience graduate students for financial support, this training program focuses on the neurobiology of movement and rehabilitation sciences, with three main goals: 1) understanding the neurobiology of movement behavior and disorders, 2) identifying and addressing the need for quantitative methods in the field and 3) applying this knowledge to the development of effective rehabilitation interventions.

2012 Foundation for Physical Therapy Florence Kendall Doctoral Scholarship Award Recipient

Awarded to five physical therapists nationwide who display outstanding potential within their first year of post-professional doctoral degree studies.

2009 Infinity Rehab Shining Star Award Recipient

Awarded to select physical therapists nationwide who demonstrate excellence in clinical care.

2008 American Physical Therapy Association Minority Award for Excellence Recipient

Financial assistance and direct mentorship, awarded to nine PT students nationwide who belong to a minority group, displayed excellence in academics, and have done extraordinary work with minority populations during physical therapy school.

Continuing Education Attended:

2020: American Spinal Injury Association Conference “Brain-Machine Interfaces: From Basic Science to Neurological Rehabilitation.”

2019: APTA CO Annual Conference “Overcoming Barriers to Delivering PT Rehabilitation in the ICU.”

2018: APTA Learning Center “How to Overcome Obstacles to Using Evidence-Based Practice in Your Clinic.”

2018: Physioplus “Wheelchair Service Provision.”

Current Teaching Responsibilities in the Entry-Level Program for Academic Year of Site Visit:

DPTR 5011 Neuroscience; Co-Course Coordinator, Fall, 60 hours

DPTR 6503 Neuromuscular Conditions 3; Lab Instructor, Fall, 6 hours