Margaret Schenkman, PT, PhD, FAPTA

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Doctor of Physical Therapy Program, University of Colorado, Anschutz Medical Campus

**Education**

Boston University, Boston, MA MS in Physical Therapy 1978 - 1980

Yale University, New Haven, CT PhD in Microbiology 1968 - 1974

Purdue University, West Lafayette, IN BS in Chemistry 1965 - 1968

**Licensure Information/Registration Number**

Colorado #PTL.0006995

**Employment and Positions Held**

2015 - 2016 Director, PhD in Rehabilitation Science, Graduate School, University of Colorado Denver, Anschutz Medical Campus, Aurora, CO

2009 - Present Associate Dean, Physical Therapy Education, School of Medicine, and Director of the Physical Therapy Program, University of Colorado Denver, Anschutz Medical Campus, Aurora, CO

2005 – Present Director of the Physical Therapy Program, University of Colorado Denver, Anschutz Medical Campus, Aurora, CO

2005 - 2009 Assistant Dean of Allied Health, School of Medicine (Tenured in 2006)

2004 - 2005 Interim Assistant Dean of Allied Health, School of Medicine, and InterimDirector of the Physical Therapy Program, University of Colorado Denver, Anschutz Medical Campus, Aurora, CO

2001 - Present Director, Human Performance Laboratory, Department of Physical Medicine and Rehabilitation, University of Colorado Denver, Anschutz Medical Campus, Aurora, CO

1999 - Present Professor, Department of Physical Medicine and Rehabilitation, University of Colorado Denver, Anschutz Medical Campus, Aurora, CO

1999 - 2004 Director of Research, Physical Therapy Program, University of Colorado Denver, Anschutz Medical Campus, Aurora, CO

1992 - 1998 Co-Director, Claude Pepper Older Americans Independence Center, Duke University Medical Center, Durham, NC

1991 - 1999 Director of the Posture and Balance Laboratory, Durham Veterans Administration Hospital, Durham, NC

1991 - 1999 Associate Professor, Physical Therapy, Graduate Program in Physical Therapy and Senior Fellow of The Center for The Study of Aging and Human Development, Duke University Medical Center, Durham, NC

1990 - 1991 Associate Professor, Program in Physical Therapy, MGH Institute of Health Professions, Boston, MA

1989 - 1990 Fellow in Biomechanical Engineering, Massachusetts Institute of Technology, Cambridge, MA; Massachusetts General Hospital, Boston, MA

1986 - 1990 Assistant Professor, Physical Therapy, MGH Institute of Health Professions, Boston, MA

1985 Assistant Professor, University of Texas Health Science Center, San Antonio, TX

1982 - 1985 Assistant Professor, Department of Physical Therapy, Northeastern University, Boston, MA

1982 - 1984 Part-time, Private Practice in Physical Therapy, Specializing in musicians with hand dysfunction

1981 - 1982 Biofeedback Therapist, Spaulding Rehabilitation Hospital, Boston, MA

1980 - 1982 Staff Physical Therapist, Spaulding Rehabilitation Hospital, Boston, MA

**Scholarly Agenda**

A major focus of my work is on interventions to improve physical function of people with neurological and other conditions. In addition, I have focused on development of models and frameworks to guide such interventions.

**Peer Reviewed Publications**

1. McManus BM, Richardson Z, Schenkman M, Morrato E. Disparities in Early Intervention Referral and Access Among a Low-income Safety Net Population: A cohort study using 2013-2015 linked administrative data. *Phys Ther*, under review
2. Josey KP, Ringham BM, Barón AE, Schenkman M, Sauder KA, Muller KE, Dabelea D, Glueck DH. Power for balanced linear mixed models with complex missing data processes.  *Statistical Methods in Medical Research with Communications in Statistics: Theory and Methods*. Under review
3. McManus BM, Hambridge S, Schenkman M, Morrato E. The Gap between Early Intervention (EI) referral and receipt of services. Pediatrics, Minor revisions requested
4. Prohaska C, Sottile PD, Nordon-Craft A, Gallagher M, Burnham EL, Clark BJ, Ho M, Tyree M, Kiser T, Vadivier RW, Liu W, Schenkman M, Moss M. Patterns of Utilization and Effects of Hospital-Specific Factors on Physical, Occupational and Speech Therapy for Critically Ill Patients with Acute Respiratory Failure in the United States: Results of a Five Year Sample Critical Care (Accepted for publication).
5. Mañago MM, Cameron M, Schenkman M. Association of the Dynamic Gait Index to fall history and muscle function in people with multiple sclerosis: A secondary data analysis. *Disability and Rehabilitation.* In Press.
6. Berliner JM, Kluger B, Corcos DM, Pelak V, Gisbert R, McRae C, Atkinson K, Schenkman M. Patient perceptions of visual, vestibular, and oculomotor deficits in people with Parkinson’s disease.  *Physiotherapy Theory and Practice*. In press
7. Kittelson A, Hoogeboom TJ, Schenkman M, Stevens-Lapsley JE, van Meeteren NVL. Person-Centered Care and Physical Therapy: a “Patients-Like-Me” Approach. *Phys Ther.* In press
8. McManus BM, Richardson Z, Schenkman M, Murphey M, Morrato EH. Timing and intensity of early intervention service use and outcomes among a safety-net population of children. *JAMA Network Open.* 2019;2(1):e187529. doi:10.1001/jamanetworkopen.2018.7529
9. Mañago MM, Glick S, Hebert JR, Coote S, Schenkman M. Strength Training to Improve Gait in People with Multiple Sclerosis: A Critical Review of Exercise Parameters and Intervention Approaches. *International Journal of MS Care*.  2019;21(2):47-56.  doi:[10.7224/1537-2073.2017-079](https://doi.org/10.7224/1537-2073.2017-079)
10. Christiansen CL, Miller MJ, Murray AM, Stephenson RO, Stevens-Lapsley JE, Hiatt WR, Schenkman ML. Behavior-change intervention targeting functional capacity, walking activity, and disability after dysvascular amputation: A randomized controlled pilot trial. *Archives Phys Med Rehabil*. 2018;99:2160-2167. doi: 10.1016/j.apmr.2018.04.011. Epub 2018 May 7.PMID:29746823
11. Hall DA, Moore C, Comelle C, SPARX STUDY GROUP. Recruitment of patients with de novo Parkinson disease: Successful strategies in a randomized exercise clinical trial. Trials 2018;14:630. [Trials](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6237042/). 2018; 19: 630. Published online 2018 Nov 14. doi: [10.1186/s13063-018-2958-z](https://dx.doi.org/10.1186/s13063-018-2958-z)
12. Mañago MM, Hebert JR, Kittelson J, Schenkman M. Feasibility of a targeted strengthening program to improve gait in people with multiple sclerosis: a brief report. *Int J Rehabil Res*. 2018:41(4);364-367. doi:[10.1097/MRR.0000000000000306](https://doi.org/10.1097/MRR.0000000000000306)
13. Manago MM, Hebert JR, Kittelson J, Schenkman M. Contributions of ankle, knee, hip, and trunk muscle function to gait performance in people with multiple sclerosis: A cross-sectional analysis. *PTJ*. 2018;98:595-604
14. Hebert JR, Corboy JR, Vollmer T, Forster JE, Schenkman M. Efficacy of Balance and Eye-movement Exercises for Persons with Multiple Sclerosis (BEEMS). *Neurology*, 2018 Feb 27;90(9):e797-e807. doi: 10.1212/WNL.0000000000005013. Epub 2018 Jan 31.PMID: 29386274
15. Schenkman M, Moore CG, Kohrt WM, et al. Effect of High-intensity treadmill exercise on the motor symptoms in patients with de novo Parkinson’ disease. A phase 2 randomized clinical trial. *JAMA* 75(2):219-226 *Neurol*. doi:10.1001/jamaneurol.2017.3517
16. Mañago M, Hebert J, Schenkman M. The psychometric properties of a clinical strength assessment protocol in people with multiple sclerosis. *Int J MS Care 2017;19:253-262.*
17. Myers K, Schenkman M. Utilizing a Curriculum Development Process to Design and Implement a New Integrated Clinical Education Experience. *J PT Education* 2017;31:71-82
18. Neumeier A, Nordon-Craft A, Malone D, Schenkman M, Clark B, Moss M. Prolonged acute care and post-acute care admission and recovery of physical function in survivors of acute respiratory failure: a secondary analysis of a randomized controlled trial. *Crit Care*. 2017;Jul 21;21(1).190. PMID: 28732512.
19. Christiansen C, Moore C, Schenkman M, et al. Factors associated with ambulation with ambulatory activity in de novo Parkinson’s disease. *J Neurol Phys Ther*. 2017 Apr;41(2):93-100.
20. Akuthota V, Marshall BJ, Mintken PE, Schenkman M, Kumbhare DA. Second order peer reviews of clinically relevant articles for physiatrists. Physical therapy May not help acute lower back pain sufferers. *Am J Phys Med Rehabil*. 2017 Sep;96(9):682-685.doi: 1097/PHM.0000000000000676. [Epub ahead of print]
21. Mañago M, Schenkman M, Berliner J, Hebert J. Gaze Stabilization and Dynamic Visual Acuity in People with Multiple Sclerosis. *J Vestibular Resear*ch 2016;26(5-6):469-477.
22. Kelmenson DA, Quan D, Nordon-Craft A, Malone D, Schenkman M, Moss M. Electrophysiological abnormalities can differentiate pre-hospital discharge functional status in critically ill patients with normal strength. *Intensive Care Med*, 2016 Sep;42(9):1504-5.
23. Moss M, Nordon-Craft A, Malone D, Van Pelt D, Kriekels W, Frankel SK, Warner ML, McNulty M, Faircloth D, Schenkman M. A Randomized Trial of an Intensive Physical Therapy Program for Acute Respiratory Failure Patients. *Am J Respir Crit Care Med*. 2016:193:1101-1110
24. Sotille P, Nordon-Craft A, Malone D, Luby D, Schenkman M, Moss M. Physical Therapist Treatment of Patients in the Neurological Intensive Care Unit: A Description of Practice, *Phys Ther*, 2015 Jul;95(7):1006-14. doi: 10.2522/ptj.20140112
25. Sottile PD, Nordon-Craft A, Malone D, Schenkman M, Moss M. [Patient and family perceptions of physical therapy in the medical intensive care unit.](http://www.ncbi.nlm.nih.gov/pubmed/26038155) J Crit Care. 2015 Oct;30(5):891-5. doi: 10.1016/j.jcrc.2015.04.119. Epub 2015 May 8. PubMed PMID: 26038155; PubMed Central PMCID: PMC4637256.
26. Malone D, Ridgeway K, Nordon-Craft A, Moss P, Schenkman M. Moss M. Physical therapist practice in the intensive care unit: Results of a national survey. Phys Ther 2015;95:1335-1344. Doi: 10.2522/ptj.20140417.
27. Olson AL, Swigris JJ, Gelkin A, Hannen L, Yagohashi K, Schenkman M, Grown KK. Physical functional capacity in idiopathic pulmonary fibrosis: Performance characteristic of the continuous-scale physical function performance test. Expert Review of Respiratory Medicine 2015;9:1-7
28. thlind JC, York MK, Carlson K, Luo P, Marks WJ Jr, Weaver FM, Stern M, Follett K, Reda D; CSP-468 Study Group. Neuropsychological changes following deep brain stimulation surgery for Parkinson’s disease: Comparisons of treatment at pallidal and subthalamic targets versus best medical therapy.  J Neurol Neurosurg Psychiatry. 2015 Jun;86(6):622-9. doi: 10.1136/jnnp-2014-308119. Epub 2014 Sep 2. PubMed PMID: 25185211.
29. Ellis R, Cress ME, Wood R, Schenkman M. Exploring the relationship between physical activity and participation in older adults with Parkinson’s disease. *Topics in Geriatrics Rehabilitation*, 2015;31:145-151
30. Gisbert R, Schenkman M. LEAP: Physical Intervention in Parkinson’s Disease. *Phys Ther* 2015;95(3):299-305.
31. Denehy L, Nordon-Craft A, Edbrooke L, Berney S, Schenkman M, Moss M. Outcome measures report different aspects of patient function three months following critical care. Intensive Critical Care Medicine 2014; 40:1862-1869
32. Ellis T, Schenkman M. The Benefits of Exercise and Physical Activity in Patients with Parkinson Disease. *Focus on Parkinson's Disease,* Amsterdam 2014;24:21-25
33. Kluger BM, Brown RP, Aerts S, Schenkman M. Determinants of objectively measured physical functional performance in Parkinson’s disease. PM&R 2014;6:992-998
34. Nordon-Craft A, Schenkman M, Edbrook L, Malone D, Moss M, Denehy L. The physical function intensive care test: implementation in survivors of critical illness. *Phys Ther* 2014;40:1862-1869; DOI: 10.2522/ptj.20130451
35. Moore CG, Schenkman M, Kohrt WK, Delitto A, Hall DA Corcos D. Study in Parkinson Disease of Exercise (SPARX): Translating high-intensity exercise from animals to humans. Contemporary Clinical Trials. 2013; 36: 90-98. DOI information: 10.1016/j.cct.2013.06.002
36. Stevens-Lapsley JE, Balter JE, Wolfe P, Eckhoff DG, Schwartz RS, Schenkman M, Kohrt WM. Dose-Response Relationship of Quadriceps Neuromuscular Electrical Stimulation with Strength Recovery after Total Knee Arthroplasty. *Phys Ther*. 2012;92:1187-96.
37. Ro
38. Nordon-Craft A, Moss M, Quan D, Schenkman M. Intensive care unit-Acquired Weakness, Implications for physical therapist management. *Phys Ther*. 2012;92:1494-1506
39. Schenkman M, Hall DA, Barón A, Schwartz RS, Mettler P, Kohrt WM Exercise for People in Early and Mid-Stages of Parkinson’s Disease: A 16-month Randomized Controlled Trial. *Physical Therapy*, 2012;92:1395-1410
40. Stevens-Lapsley J, Kluger B, Schenkman M. Quadriceps muscle weakness, activation deficits, and fatigue with Parkinson’s disease. *Neurorehabil and Neural Repair*. 2012;26:533-541.
41. Hebert J, Manago M, Corboy J, Schenkman M. The effects of vestibular rehabilitation on MS-related fatigue: a randomized controlled trial. *Phys Ther*. 2011;91:1166–1183
42. Fisher BA, Schenkman M. Functional recovery of a patient with anorexia nervosa: physical therapist management in the acute care hospital setting. *Phys Ther*. 2012; 92: 595-604.
43. Stevens-Lapsley JE, Schenkman ML, Dayton MR. Comparison of self-reported Knee injury and Osteoarthritis Outcome Score (KOOS) to objective measures of performance in patients after total knee arthroplasty. *Physical Medicine and Rehabilitation*. 2011; 3:541-9.
44. Nordon-Craft A, Schenkman M, Ridgeway K, Benson A, Moss M. Physical Therapy Management and Patient Outcomes following ICU Acquired Weakness: A Case Series. *JNPT 2011;*35:133-140
45. Schenkman M, Ellis T, Christiansen C, et al. Profile of Functional Limitations and Task Performance among People with Early and Mid-Stage Parkinson Disease. *Phys Ther* 2011;91:1339-1354.
46. Ene H, McRae C, Schenkman M. Attitudes of people with Parkinson disease toward exercise following participation in an exercise intervention study. *JNPT*, 2011, 35;34-40
47. Schenkman M, McFann K, Barón, AE. “PROFILE PD”: Profile Of Function and Impairment Level **E**xperience with **PD.** Clinimetric Properties of a Rating Scale for Physical Therapist Practice. JNPT 2010;34:182-192
48. Follett KA, Weaver FM, Stern M, Hur K, Harris CL, Luo P, Marks WJ Jr, Rothlind J, Sagher O, Moy C, Pahwa R, Burchiel K, Hogarth P, Lai EC, Duda JE, Holloway K, Samii A, Horn S, Bronstein JM, Stoner G, Starr PA, Simpson R, Baltuch G, De Salles A, Huang GD, Reda DJ; CSP 468 Study Group. Pallidal versus subthalamic deep-brain stimulation for Parkinson’s disease.  N Engl J Med. 2010 Jun 3;362(22):2077-91. doi: 10.1056/NEJMoa0907083. PubMed PMID: 20519680.
49. Schenkman M. [Reply: a randomized controlled trial of movement strategies compared with exercise for people with Parkinson's disease.](http://www.ncbi.nlm.nih.gov/pubmed/20077472) Mov Disord. 2010 Mar 15;25(4):524. doi: 10.1002/mds.22881. PubMed PMID: 20077472.
50. Morris ME, Martin CL, Schenkman M. Striding out with Parkinson disease: evidence based physical therapy for gait disorders. *Phys Ther* 2010;90:280-288.
51. Christiansen CL, Schenkman ML, McFann K, Wolfe P, Kohrt WM. Walking economy in people with Parkinson’s disease. *Mov Disord*. 2009;24:1481-1487.
52. Weaver FM, Follett K, Stern M, Hur K, Harris C, Marks WJ Jr, Rothlind J, Sagher O, Reda D, Moy CS, Pahwa R, Burchiel K, Hogarth P, Lai EC, Duda JE, Holloway K, Samii A, Horn S, Bronstein J, Stoner G, Heemskerk J, Huang GD; CSP 468 Study Group. [Bilateral deep brain stimulation vs best medical therapy for patients with advanced Parkinson disease: a randomized controlled trial.](http://www.ncbi.nlm.nih.gov/pubmed/19126811) JAMA. 2009 Jan 7;301(1):63-73. doi: 10.1001/jama.2008.929. PubMed PMID: 19126811; PubMed Central PMCID: PMC2814800.
53. Schenkman M, Jordan S, Akuthota V, et al. Functional movement training for recurrent low back pain: lessons from a pilot randomized controlled trial. *PM&R.* 2009;1:137-146*.*
54. Jankowski CM, Gozansky WS, Van Pelt RE, Schenkman ML, et al. Relative contributions of adiposity and muscularity to physical function in healthy older adults. *Obesity.* 2008;16(5):1039-1044.
55. Schenkman M, Hall D, Kumar R, Kohrt WM. Endurance exercise training to improve economy of movement of people with Parkinson disease: three case reports. *Phys Ther.* 2008;88:63-76.
56. Hearty T, Schenkman M, Kohrt W, Cress ME. Continuous Scale Physical Functional Performance Test: appropriateness for middle-aged adults with and without Parkinson’s disease. *J Neurol Phys Ther.*2007;31(2):64-70.
57. Schenkman M, Deutsch J, Gill-Body K. An integrated framework for decision making in neurological physical therapy practice. *Phys Ther.* 2006;86:1681-1702.
58. Cress ME, Petrella JK, Moore TL, Schenkman M. Continuous-Scale Physical Functional Performance Test: validity, reliability, and sensitivity of data for the short version. *Phys Ther*. 2005;85:323-335.
59. Cutson TM, Zhu C, Whetten K, Schenkman M. Observations of spouse-patient dyads with Parkinson's disease over five years. *J Neurol Phys Ther.* 2004;28:122-128.
60. Scott J, Schenkman M, Moore L. An exploration of communication and leadership in the nursing home: setting the stage for sustainable change. *J Nurs Care Qual.*2004;19:242-252.
61. Schenkman M, Cutson TM, Zhu CW, Whetten-Goldstein K. A longitudinal evaluation of patient’s perceptions of Parkinson’s disease. *Gerontologist*. 2002;42:790-798.
62. Schenkman M, Cutson TM, Kuchibhatla M, Scott B, Cress ME. Application of the Continuous-Scale Physical Functional Performance Test (CS-PFP) to people with Parkinson’s disease. *Neurol Report.* 2002;26:130-138.
63. Martin M, Shinberg M, Kuchibhatla M, Ray L, Carollo JJ, Schenkman ML. Gait initiation in community-dwelling adults with Parkinson disease: comparison with older and younger adults without the disease. *Phys Ther.* 2002;82:566-577.
64. Hoenig H, Pieper C, Zolkewitz M, Schenkman M, Branch LG. Wheelchair users are not necessarily wheelchair bound. *J Am Geriatr Soc*. 2002;50:645-654.
65. Taylor D, Schenkman M, Zhou J, Sloan F. The relative effect of Alzheimer's disease and related dementias, disability, and comorbidities on cost of care for elderly persons. *J*

*Gerontol B Psychol Sci Soc Sci*. 2001;56:S285-S293.

1. Schenkman M, Clark K, Xie T, et al. Spinal flexibility and performance of a standing reach task: participants with and without Parkinson’s disease. *Phys Ther*. 2001;81:1400-1411.
2. Schenkman M, Zhu CW, Cutson TM, Whetten-Goldstein K. Longitudinal evaluation of economic and physical impact of Parkinson’s disease. *Parkinsonism Relat Disord.* 2001;8:41-50.
3. Whetten-Goldstein K, Cutson T, Zhu W, Schenkman M. Financial burden of chronic neurological disorders to patients and their families: what providers need to know. *Neurol Report.* 2000;24:140-144.
4. Schenkman M, Morey M, Kuchibhatla M. Spinal flexibility and balance control among community-dwelling adults with and without Parkinson's disease. *J Gerontol A Biol Sci Med Sci.* 2000;55:M441-M445.
5. Shipp KM, Purse JL, Gold DT, Pieper CF, Sloane R, Schenkman M, Lyles KW. Timed loaded standing: a measure of combined trunk and arm endurance suitable for people with vertebral osteoporosis. *Osteoporos Int*. 2000;11:914-922.
6. Kuchibhatla M, Pieper C, Schenkman M. An application of generalizability theory to a study of physical performance. *Aging Clin Exp Res*. 2000;12:29-34.
7. Schenkman M, Bliss S, Day L, et al. A model for management of patients with neurological dysfunction: update and case analysis. *Neurol Report*. 1999;23:145-157.
8. Morey MC, Schenkman M, Studenski SA, et al. Spinal-flexibility-plus-aerobic versus aerobic-only training: effect of a randomized clinical trial on function in at-risk older adults. *J Gerontol A Biol Sci Med Sci*. 1999;54:M335-M342.
9. Cutson TM, Sloan R, Schenkman M. Development of a clinical rating scale for persons with Parkinson's disease. *J Am Geriatr Soc*. 1999;47(6):763-764.
10. Purser JL, Pieper CF, Duncan PW, Gold DT, McConnell ES, Schenkman ML, et al. Reliability of physical performance tests in four different randomized clinical trials. *Arch Phys Med Rehabil.* 1999;80:557-561.
11. Cavanaugh J, Shinberg M, Ray L, Kuchibhatla M, Schenkman M. Kinematic characterization of standing reach: comparison of younger vs older subjects*. Clin Biomech*. 1999;14:271-279.
12. Koplas K, Gans H, Wisely M, Kuchibhatla M, Cutson TC, Gold DT, Taylor CT, Schenkman M. Quality of life and Parkinson's disease. *J Gerontol A Biol Sci Med Sci*. 1999;54:M197-M202.
13. Schenkman M. Selegiline and physical intervention in treatment of early Parkinson’s disease. *PT Magazine*. 1998;6:50-61.
14. Schenkman M, Cutson TM, Kuchibhatla M, et al. A randomized controlled exercise trial in patients with Parkinson's disease*. J Am Geriatr Soc.* 1998;46:1207-1216.
15. Cavanaugh J, Schenkman M. Physical therapy evaluation and treatment in stroke rehabilitation: a case report*. Physical Therapy Case Reports.* 1998;1:200-209.
16. Whetten-Goldstein K, Sloan F, Kulus E, Cutson TC, Schenkman M. The burden of Parkinson's disease on society, family and the individual. *J Am Geriatr Soc.* 1997;45:844-849.
17. Schenkman M, Laub KC, Shinberg M, Kuchibhatla M, Ray L. New measures for shoulder protraction and thoracic rotation. *J Orthop Sports Phys Ther.* 1997;25:329-335.
18. Schenkman M, Cutson T, Chandler J, Kuchibhatla M, Duncan PW, Pieper C. Reliability of physical measures in Parkinson's disease. *Phys Ther.* 1997;77:19-27.
19. Schenkman M, Hughes MA, Samsa G, Studenski SA. The relative importance of strength and balance in the performance of sitting to standing by functionally impaired older individuals. *J Am Geriatr Soc.* 1996;44:1441-1446.
20. Hughes MA, Myers BS, Schenkman ML. The role of strength in rising from a chair - in the frail elderly. *J Biomech.* 1996;12:1509-1513.
21. Hughes MA, Schenkman M. Chair rise strategies in the functionally impaired. *J Rehabil Res Dev*. 1996;33:409-412.
22. Schenkman M, Riley PO, Pieper C. Sit to stand from progressively lower chair heights - young and older subjects. *Clin Biomech.* 1996;11:153-158.
23. Schenkman M, Shipp K, Chandler J, Studenski S, Kuchibhatla M. Relationships between mobility of the axial structures and physical performance. *Phys Ther.* 1996;76:276-285.
24. Schenkman M, Hughes MA, Bowden MA, Studenski SA. A clinical tool for measuring functional axial rotation: a technical report. *Phys Ther.* 1995;75:151-156.
25. Hughes MA, Schenkman ML, Chandler JM, Studenski SA. Postural response to platform perturbation: kinematics and electromyography. *Clin Biomech.* 1995;10:318-322.
26. Cutson TM, Laub KC, Schenkman M. Treatment of Parkinson's disease: pharmacologic and non-pharmacologic interventions. *Phys Ther.* 1995;75:363-373.
27. Watson CJ, Schenkman M. Physical therapy management of isolated serratus anterior paralysis. *Phys Ther.* 1995;75:194-202.
28. Hughes MA, Wiener DK, Schenkman ML, Long RM, Studenski SA. Chair rise strategies in the elderly. *Clin Biomech.* 1994;9:187-192.
29. Schenkman M. Evaluation and measurement considerations for physical rehabilitation of patients who have neurologic deficits. *Topics in Geriatric Rehabilitation.* 1994;10(2):1-21.
30. Manos P, Schenkman M. Rehabilitation management of a geriatric individual with neurologic and pulmonary dysfunction: a case analysis. *Topics in Geriatric Rehab.* 1992;7(4):36-54.
31. Ikeda E, Schenkman M, Riley PO, Hodge WA. Influence of age on dynamics of rising from a chair. *Phys Ther.* 1991;71:473-481.
32. Riley PO, Schenkman M, Mann RW, Hodge WA. Mechanics of a constrained chair rise. *J Biomech.* 1991;24(1):77-85.
33. Schenkman M, Berger R, Riley PO, Mann RW, Hodge WA. Whole-body movements during rising to standing from sitting. *Phys Ther*. 1990;70:638-648.
34. Jeng SF, Schenkman M, Riley PO, Lin SJ. Reliability of a kinematic assessment of the sit-to-stand movement. *Phys Ther.* 1990;70:511-520.
35. Schenkman M, Butler RB. A model for multisystem evaluation, interpretation, and treatment of individuals with neurologic dysfunction. *Phys Ther.* 1989;69:538-547.
36. Schenkman M, Butler RB. A model for multisystem evaluation treatment of individuals with Parkinson's disease. *Phys Ther.* 1989;69:932-943.
37. Schenkman M, Donovan J, Tsubota J, Kluss M, Stebbins P, Butler RB. Management of individuals with Parkinson's disease: rationale and case studies. *Phys Ther.* 1989;69:944-955.
38. Schenkman M, Rugo de Cartaya V. Kinesiology of the shoulder complex. *J Orthop Sports Phys Ther*. 1987;8:438-450.
39. Merenstein A, Schenkman M. Pernicious anemia: a case study. *Phys Ther.* 1984*;*64:1076-1077.
40. Schenkman M, Butler R, Naeser M, Kleefield J. Cerebral hemisphere asymmetry and functional recovery from hemiplegia. *Neurology.* 1983;33:473-477.
41. Schenkman M, Ward DC, Moore PB. Covalent attachment of a messenger RNA to the *escherichia coli* ribosome*. Biochim Biophys Acta.*1974;353:503-508.

*Books and Book Chapters*

1. Schenkman ML, Bowman JP, Gisbert RL, Butler RB. Clinical Neuroscience for Rehabilitation. Pearson, Boston, MA, 2013
2. Schenkman M. Current concepts in rehabilitation of people with Parkinson disease. In: McCulloch K, ed. Home Study Course, Alexandria, VA, American Physical Therapy Association, 2011
3. Schenkman M. Treatment of a patient with Parkinson’s disease. In: Partridge C, ed.

*Neurological Physiotherapy: Basis of Evidence for Practice*. London: Whurr Publishers; 2003:145-168.

1. Schenkman M. Chapter 6 - Parkinson’s disease: update on anatomy, physiology, pharmacology, and treatment. In: Riolo L, ed. *Topics in Physical Therapy: Neurology* [an APTA home study course]. Alexandria, VA: American Physical Therapy Association; 2003:6.1-6.75.
2. Schenkman M, Gill-Body K. *A Compendium of Materials for Teaching Professional Physical Therapy Content*. Alexandria, VA: Neurology Section of the American Physical Therapy Association; 2000.
3. Schenkman M, Riegger-Krugh C. Physical approaches to improve gait of elderly individuals. In: Masdeu J, Sudarsky L, Wolfson L, eds. *Gait Disorders of Aging*. Philadelphia, PA: Lippencott-Raven; 1997:327-354.
4. Schenkman M. Kinematics of the shoulder complex. In: Wilk K, Andrews JR, eds. *Rehabilitation of the Athletic Shoulder*. New York, NY: Churchill Livingstone; 1994:15-33.
5. Schenkman M. Physical therapy management of the ambulatory Parkinson's patient. In: Turnbull G, ed. *Parkinson's Disease*. Churchill Livingstone; 1992:137-190.

*Videotapes*

1. The Axial Mobility Exercise Program. Laub KC, Schenkman M. Duke University Claude D Pepper Older Americans Independence Center: Produced by Claiborne Clark;1995: 48 minutes.
2. The Axial Mobility Exercise Program. Instructor's tape. Laub KC, Schenkman M. Duke University Claude D Pepper Older Americans Independence Center: Produced by Claiborne

*Podcasts*

1. Craik R (moderator), Gill-Body K, Schenkman M.
2. Ellis T (moderator), Earhart G, Fisher B, Horak F, Schenkman M. Exercise, balance, and Parkinson's disease. Journal Club Podcast, *J Neurol Phys Ther*, June 2009. Pasadena, CA: Science Audio. <http://www.scienceaudio.net/jnpt/200906/jnpt\_200906\_journal\_club.mp3>.

**Peer Reviewed Scientific and Professional Presentations (last 5 years)**

1. Rodriguez J, Schenkman M, Backstrom K. A Case Study and Pilot for developing and implementing the yearlong internship: Building a Sustainable Model of Clinical Education through an Academic and Clinical Partnership. Educational Leadership Conference, Baltimore, MD, October 2015
2. Schenkman M. Conceptual Basis and Science of Exercise for People with Parkinson’s Disease. Invited presentation, Center for Neuroscience Discussion Group, University of Colorado, Department of Neurology. October 17, 2012
3. Schenkman M. Physical Intervention for People in Early and Mid-Stage Parkinson’s Disease. Invited Webinar. National Parkinson’s Disease Foundation, October 9, 2012

**Non-Peer Reviewed Publications**

1. Rodriguez JW, Stelzner DA, Krapfl B, Jordan SL, Schenkman ML. Balance & Function Protocol Instructor’s Manual. Exercise, Physical Function, and Parkinson’s Disease Grant. Funded by National Institute of Child Health and Human Development. Physical Therapy Program, University of Colorado Health Sciences Center Denver, CO; 2006.
2. Stelzner D, Rodriguez J, Krapfl B, Jordan S, Schenkman M. Instructor’s adherence protocol: stay active with Parkinson’s disease program. Physical Therapy Program, University of Colorado at Denver and Health Sciences Center. Denver, CO; 2004.
3. Schenkman M, Scherer S, Riegger-Krugh C, Cutson TM. Measurement of impairments and functional limitations: conceptual considerations and practical applications. *Crit Rev Phys Rehabil Med.* 2002;14:83-161.
4. Schenkman M, Keysor J, Chandler J, Laub KC, MacAller H. Axial mobility exercise program: an exercise program to improve functional ability - therapist’s manual. Claude D. Pepper Older American’s Independence Center at Duke University. Center on Aging, Duke University Medical Center. Durham, NC;1994.
5. Chandler J, Laub KC, Keysor J, MacAller H, Schenkman M. Axial mobility exercise program: an exercise program to improve functional ability - participant’s manual. Claude D. Pepper Older American’s Independence Center at Duke University. Center on Aging, Duke University Medical Center. Durham, NC;1994.
6. Schenkman M (guest editor). *Topics in Geriatric Rehabilitation.* 1994;10:(2).
7. Schenkman M. To unlock the logic of evaluation. *PT Magazine.* 1993;1:57-63.
8. Schenkman M. Physical measures and techniques to enhance motor recovery: correlation with pathophysiology. *Neurologic* *Rehabilitation*: *Proceedings from the Am Acad Neurol*. April 1991;43-57.
9. Schenkman M. The relationship of neurological and mechanical factors in balance control. In: Duncan PW, ed. *Balance: Proceedings of the APTA Forum*. Alexandria, VA: APTA;1990:29-41.
10. Schenkman M (guest editor). *Neurol Report.* 1989;13(3).
11. Schenkman M. An overview of impairments of Parkinson's disease with emphasis on the musculoskeletal system. *Neurol Report.* 1988;12:45-47.
12. Schenkman M (guest editor). *Neurol Report.* 1988;12(3).

**Non-Peer Reviewed Scientific and Professional Presentations (last 5 years)**

1. Schenkman M. Aerobic exercise – Does intensity matter? And is it enough? Part of an on-line course developed by the Parkinson’s Foundation, 2019
2. Schenkman M. Anne Shumway-Cook Lecture at APTA CSM: Parkinson’s disease and other neurological disorders, a Journey through time. Presented January, 2019
3. Schenkman M. Treatment for people with Parkinson’s disease, Parts I and II. Yamagata Prefectural University, Yamagata, Japan, May 25, 2017
4. Schenkman M. How to create high quality research in academic physical therapy. Invited keynote presentation, Annual Meeting of the Japan Physical therapy Association, Tokyo, Japan May 20, 2017.
5. Schenkman M. Exercise is important for those who live with Parkinson’s disease. 6th Annual Parkinson’s Symposium Life Care Center of Longmont. April 26, 2017
6. Schenkman M. Exercise is important for those who live with Parkinson’s disease. CU Movement Disorders, Third annual Parkinson’s disease symposium, October 1, 2016
7. Schenkman M. Why exercise and activity are important for living with Parkinson’s disease. Parkinson’s Association of the Rockies, September 26, 2015
8. Schenkman M. Exercise for people with PD. Community meeting, Boulder, CO June 6, 2015
9. Schenkman M. The effects of exercise on PD: Evidence and unanswered questions. Boulder PD Support Group; Boulder, CO, May 19, 2015
10. Schenkman M. Exercise and physical activity for people with PD. Movement Disorders Retreat, University of Colorado, May 5, 2015
11. Schenkman M. Exercise for people with Parkinson’s disease. Movement Disorders Conference, University of Colorado. Denver, CO. April 15, 2015
12. Schenkman M. Exercise for people with Parkinson’s disease. Parkinson’s Association of the Rockies Conference. Denver, CO. April 10, 2015
13. Schenkman M. The effects of exercise on PD: Evidence and unanswered questions. Parkinson’s Disease Foundation. Webinar, January 13, 2015

**Funded/In Review Grant Activity**

*Ongoing Support*

Schenkman M (PI). Davis Phinney Foundation 07/01/16-06/30/18

A novel approach to fatigue in Parkinson’s disease. This cross sectional investigation examines the contributions of visual, vestibular and oculomotor deficits to fatigue in those living with Parkinson’s disease. ($42,000)

*Completed Support*

Schenkman M (PI). ProjectSparx ($10,000). 03/01/15-03/01/17

Fatigue in Parkinson’s Disease: The Contribution of Visual, Vestibular, and Oculomotor Deficits.

Hebert JR, Schenkman M (Co-PI) National MS Society 10/01/12- 09/30/15

This randomized clinical trial is designed to examine the impact of vision and balance training on fatigue and postural control of individuals with multiple sclerosis. ($536,295.00 direct over three years)

Schenkman M, Corcos D (Co-PIs) R01 NS074343-01A1 12/1/2011 – 11/30/2015

Exploratory study of different doses of endurance exercise in people with Parkinson’s disease. ($2.930 million). This phase II randomized clinical trial is designed to determine parameters of exercise intensity that attenuate progression of symptoms of PD. Upon the completion of this study we will have defined the needed parameters for a phase III clinical trial.

Stevens-Lapsley J (PI) NIH R01-HD065900   07/1/2011-6/30/16

Progressive Rehabilitation for Total Knee Arthroplasty. The major goal of this project is to evaluate the effectiveness of a more intensive rehabilitation program compared to traditional rehabilitation after total knee arthroplasty.

Role: Co-I

Schenkman M (PI): NIH3 - R01 HD043770-05S2 (2010-2011) no cost extension.

Moss M (PI), Quon D, Nordon-Craft, A, Schenkman M. The diagnosis and treatment of critical care polyneuromyopathy. NIH.NRO1-1051-01A1, 2009-2014. (2.279 million direct over five years). Determine whether critical care illness can be identified early and determine the impact of an impact of intensive physical intervention for people with acute respiratory failure who have developed polyneuromyopathy. (Role: Co-I)

Schenkman M (PI), Hebert J, Corboy J. The effects of vestibular rehabilitation on MS-related fatigue: randomized control trial. National Multiple Sclerosis Society, February 2008-December 31, 2009. ($43,774). RCT that examines the benefits of vestibular exercise for people with PD.

Schenkman M (PI): Exercise from the perspective of the person who lives with Parkinson’s disease. Davis Phinney Foundation ($59,186) this qualitative study explored the experience and perspectives of graduates from a 16-month exercise intervention study a year or more after graduation. (July 2016-June 2018)

Schenkman M (PI), Baron A, Kohrt W, Kumar R, Schwartz R. Exercise, physical function, and Parkinson’s disease. NIH.HD43770, 2003-2008; no cost extension through 2011. ($1.125 million direct over five years). RCT comparing three exercise approaches for people with PD.

Schenkman M (PI). Comparison of three exercise interventions for people with recurrent low back pain. Physical Therapy Foundation, 2001. ($40,000).

Taylor D (PI), Schenkman M (Co-I), Sloan F. Economic burden of Alzheimer’s disease. AARP Andrus Foundation, 1999. ($75,000).

Schenkman M (PI), Whetten-Goldstein K. Holistic burden of Parkinson's disease. Duke University Medical Center Small Grant, 1997-1998. ($7,500).

Cutson T (PI), Schenkman M (co-investigator). Reliability and validity of a rating scale by persons with Parkinson's disease. Claude D Pepper OAIC Research and Development Funds, 1993-1994. ($8,000).

Cohen HJ (Director), Schenkman M (Co-Director). Center grant from Claude D Pepper Older American Independence Center. National Institute of Aging, 1992-1997. ($6.2 million).

Schenkman M (PI), Duncan PW, Chandler JC. Axial mobility and Parkinson's disease (Part of the Claude D Pepper Older Americans Independence Center). National Institute of Aging, 1992-1997. ($191,075).

Lyles K (PI), Schenkman M (Co-PI). Research Development Core (Part of the Claude D Pepper Older Americans Independence Center). National Institute of Aging, 1992-1997. ($875,998).

Schenkman M (PI). Relationship between axial mobility and functional performance. Duke University Medical Center Small Grant, 1992-1993. ($7,241).

Studenski S (PI), Duncan PW, Chandler J, Schenkman M. Do changes in strength improve balance in elderly men? Veterans Administration R & D, 1991-1994. ($345,000).

Schenkman M (PI). Balance and functional performance of individuals with Parkinson's disease. The Foundation for Physical Therapy, 1990. ($23,780).

**Membership in Scientific/Professional Organizations**

American Physical Therapy Association, (APTA) 1980-present

Education Section, 2008-present

Research Section, 2001-present

Neurology Section, 1982-present

Member, Awards Committee of the Neurology Section, 2008-2011

 Secretary of Neurology Section, APTA, 1998-2003, 2004-2005

Specialty Academy of Certification Experts (SACE) of the APTA, 1996-1999

Gerontological Society of America, 1992-1999

Membership Committee, Section on Clinical Medicine, 1994-1997

**Consultative and Advisory Positions Held**

NIH Musculoskeletal and Rehabilitation Science Study Section, Permanent Member: 2014-2018

Steering Committee for the Comprehensive Opportunities for Rehabilitation Research Training (CORRT) Program 2012-present

NIH Review Panels: Ad-hoc member: NIH - Musculoskeletal and Rehabilitation Sciences Study Section,2009 – 2014; NIH Special Emphasis Panel, 2011

Data Safety Monitoring Board: CSP 468: A Comparison of Best Medical Therapy and Deep Brain Stimulation of Subthalamic Nucleus and Globus Pallidus for the Treatment of Parkinson’s Disease. Hines VA Hospital, Hines, IL 60141, Follow-Up Study 2010-2014

Editorial Board Member, *Physical Medicine and Rehabilitation,* 2007-present

NIH Scientific Review Panel for Program Projects, National Center for Complementary and Alternative Medicine (NCCAM), June 2004

Expert Panel Member, Minimum Data Set 3 (MDS-3) Validation, Rand Corporation, Santa Monica, CA, 2003-2005

Data Safety Monitoring Board: CSP 468: A Comparison of Best Medical Therapy and Deep Brain Stimulation of Subthalamic Nucleus and Globus Pallidus for the Treatment of Parkinson’s Disease. Hines VA Hospital, Hines, IL 60141, 2001-2009

Editorial Board Member, *Physical Medicine and Rehabilitation*, 2008-2016

Editorial Board Member, *Journal of Neurologic Physical Therapy: JNPT,* 2001-2008

Editorial Board Member, *Journal of the American Geriatrics Society,* 1999-2007

Manuscript Reviewer (ongoing), *Archives of Physical Medicine and Rehabilitation,*

*J Neurological Phys Therapy, Movement Disorders, PM&R, Physical Therapy, Physiotherapy*

*Canada, Posture and Gait*

Ad Hoc Reviewer, National Institute of Disability and Rehabilitation Research, 1993

Site visitor, National Institute of Aging, National Institutes of Health , 1992

**Services to the University/College/School on Committees/Councils/Commissions** *School of Medicine*

Member: Academic and Student Affairs Leadership Committee, 2008-present

Member: Office of Community-based Medical Education Advisory Panel, 2010

Internal Member: External Review Team (ERT) for the Academic Program Review of the Center for Women’s Health Research at the University of Colorado Denver (UC Denver), 2010

Member: Committee for Self-Study, Medical School Re-accreditation, 2007-2009

Other Schools / Departments in the University

Member: Academic Leadership and Student Affairs Committee 2008-present

Member: AMC Assessment Committee, 2008 – 2012

Member: Search Committee for the Program Director, Child Health / Physician Assistants Program, 2007-2008

Member: Search Committee for Chair of the Department, Cell and Developmental Biology, 2007-2008

*Department of Physical Medicine and Rehabilitation*

Executive Committee, 2018-present

Research Oversight Committee, 2016-present

ICR Funds committee, 2003-present

Chairperson: Steering Committee: Interdisciplinary Movement Science Laboratory 2008-2013

Chairperson: Department Advisory Committee, Dec 2003-2010

Search Committee, Administrator for PM&R, 2008

Steering Committee, Center for Gait and Movement Analysis, 1999-2007

Chairperson: Steering Committee for the HPL, 2001-2002

*Physical Therapy Program*

Chairperson: Search Committee, Orthopedic Physical Therapy Faculty, Dec 2003-2005

Member: Search Committee, Medicine Physical Therapy Faculty, Dec 2003-2005

Member: Search Committee, Director of Physical Therapy, Dec 2003-Mar 2004

Chairperson: Research Committee, Physical Therapy Program, 1999-2005

Member: Curriculum Committee, Physical Therapy Program, 1999-2005

**Honors and Awards**

Catherine Worthingham Fellow of the American Physical Therapy Association, March 2008

Jack Walker Award for the Best Article on Clinical Practice published in *Physical Therapy*, 2007

Bob Doctor Service Award, Colorado Chapter of the American Physical Therapy Association, April 2006

Research Award, Neurology Section, APTA, 2004

Marian Williams Award for Research in Physical Therapy, APTA, 2003

Golden Pen Award, APTA, 2003

MIT/MGH Career Development Award in Biomechanical Engineering, National Institute of Disability and Rehabilitation Research, 1989-1990

**Mentoring Activities Current Position**

*PhD in Rehabilitation Science*

Matt Miller, Secondary mentor (2016-present)

Jean Marie Berliner, Primary Mentor (2012-present)

Andrew Kittelson, PhD (2011-2016) Postdoctoral Fellow, U Colorado

Bahar Shahidi (2011-2015) Postdoc, U California, San Diego

*Clinical Sciences PhD*

Mark Manago, Primary Mentor Senior Instructor, U Colorado

Dana Judd (2009-2015) Assistant Professor, U Colorado

Michael Bade, (2008-2012) Assistant Professor, U Colorado

Jeffrey Hebert (2008-2014) Assistant Professor, U Colorado

*Rocky Mountain University (DsC)*

Amy Nordon-Craft (2001-2009) Assistant Professor, U Colorado

Linda Csiza (2002-2007) Private Practice, Houston, TX

*K-Awards*

Beth McManus, PhD (2015-present)

Cory Christiansen, PhD (2013-2016)

Amy Huebschmann, MD (2009-2011)