

Jennifer A. Schrack

Johns Hopkins School of Public Health
Department of Epidemiology
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Education & Training:

- 2011 - 2012 Postdoctoral Fellowship, Translational Gerontology Branch, National Institutes of Health, National Institute on Aging (Mentor: Luigi Ferrucci, MD, PhD)
- 2011 PhD, Epidemiology, Johns Hopkins Bloomberg School of Public Health
- 2002 M.S., Kinesiology, University of Michigan
- 1995 B.S., Accountancy, Villanova University

Research & Professional Experience:

- 2017 - Co-Investigator
Aging, Cognition, and Hearing Evaluation in Elders (ACHIEVE) (PI: Lin)
- 2017 - Director
Program in The Epidemiology of Aging, Department of Epidemiology, Johns Hopkins University, Bloomberg School of Public Health
- 2017 - Special Volunteer, Translational Gerontology Branch, National Institute on Aging, National Institutes of Health, Baltimore, MD
- 2014 - Co-Investigator
Study To Understand Falls Reduction and Vitamin D in You (STURDY) (PI: Appel)
- 2013 - Assistant Professor
Department of Epidemiology, Johns Hopkins School of Public Health

Joint Appointment
Zanvyl Kreiger School of Arts and Sciences, Johns Hopkins University

Core Faculty, Center on Aging and Health
Johns Hopkins Medical Institutions

Associate Faculty

Welch Center for Prevention, Epidemiology, and Clinical Research

Co-Investigator

Multicenter AIDS Cohort Study (MACS) (PI: Margolick)

Co-Chair, Aging Working Group (2016 -)

2009 -

Co-Investigator

Baltimore Longitudinal Study of Aging (BLSA) (PI: Ferrucci, Studenski)

2012 – 2013

Instructor

Department of Epidemiology, Johns Hopkins School of Public Health

2007 – 2011

Special Volunteer, National Institute on Aging, Baltimore, MD. Supervisor: Luigi Ferrucci, MD, PhD

2005 – 2006

Exercise Specialist, Diabetes and Health Education Center, Mission Hospitals, Asheville, NC

2003 – 2005

Exercise Physiologist, National Institute on Aging/Medstar Research Institute Clinical Research Branch, Baltimore, MD. Supervisor: Luigi Ferrucci, MD, PhD

2002 – 2003

Clinical Research Coordinator, Substrate Metabolism Laboratory, University of Michigan, Ann Arbor, MI. Supervisor: Jeff Horowitz, PhD

Professional Activities:

Society Memberships

2007 – Present

The Gerontological Society of America

2015 – Present

The American College of Sports Medicine

2017 – Present

International Society for the Measurement of Physical Behavior

Society Leadership

Co-chair of The Measurement, Statistics, and Research Design Interest Group of The Gerontological Society of America (2016 -)

Editorial Activities:

Editorial Board

Journals of Gerontology Medical Sciences (2017 -)

Reviewer

American Journal of Physical Medicine and Rehabilitation

British Medical Journal

British Journal of Sports Medicine

European Journal of Applied Physiology

Experimental Gerontology

Gait & Posture

Journal of Aging and Physical Activity

Journal of the American Geriatrics Society

Journals of Gerontology Medical Sciences
Journal of Rehabilitation and Assistive Technologies Engineering
Medicine & Science in Sports and Exercise
PLoS One
Trials

NIH Review

2016 Member, Special Emphasis Panel HHS-NIH-NIDA(AG)-RFP-16-018: Objective Measurement of Physical Activity

Honors & Awards:

2017 Johns Hopkins University Catalyst Award

2016 Cited for Teaching Excellence: Epidemiology of Aging, JHSPH, in-person & online

2015 Cited for Teaching Excellence: Epidemiology of Aging, JHSPH

2014 Cited for Teaching Excellence: Epidemiology of Aging, JHSPH

2014 Johns Hopkins Edward R. Roybal Center Pilot Project Award

2013 Editor's Choice for: **Schrack JA**, Zipunnikov V, Goldsmith AJ, Crainiceanu CM, Simonsick EM, Ferrucci L. *Assessing the "Physical Cliff": Detailed Quantification of Physical Activity and Aging*. J Gerontol A Biol Sci Med Sci. 2014 Aug;69(8):973-9. PMID: 24336819.

2013 Johns Hopkins Center for AIDS Research Faculty Development Award

2012 Johns Hopkins Center on Aging and Health Research on Aging Showcase Poster Competition, 2nd place Postdoctoral and Junior Faculty Category

2007 – 2011 National Institute on Aging Epidemiology and Biostatistics of Aging Training Grant Fellow, Johns Hopkins Bloomberg School of Public Health

2010 Johns Hopkins Center on Aging and Health Research on Aging Showcase Poster Competition, 2nd place Student Category

2009 National Institutes of Health National Graduate Student Research Festival Participant

2009 Johns Hopkins Center on Aging and Health Certificate in Gerontology

2009 Johns Hopkins Center on Aging and Health Research on Aging Showcase Poster Competition, 3rd place, Student Category

- 2007 National Institutes of Health / National Institute on Aging Intramural Research Training Fellowship Award, Summer 2007
- 2002 University of Michigan Kinesiology Graduate Student Commencement Speaker
- 2000 – 2001 University of Michigan Graduate Student Fellowship Award
- 1992 – 1995 Gamma Phi Honor Society, Villanova University

Publications:

Peer Reviewed Journal Articles:

*Denotes a mentoring role on a manuscript for student or trainee co-author

1. **Schrack JA**, Simonsick EM, Ferrucci L. *Comparison of the Cosmed K4b2 portable metabolic system in measuring steady-state walking energy expenditure.* PLoS One. 2010 Feb 18;5(2):e9292. PMID: 20174583
2. **Schrack JA**, Simonsick EM, Ferrucci L. *The Energetic Pathway to Mobility Loss: An Emerging New Framework for Longitudinal Studies on Aging.* Journal of the American Geriatrics Society. 2010 Oct 1;58:S329. PMID: 21029063
3. Ferrucci L, **Schrack JA**, Knuth ND, Simonsick EM. *Aging and the Energetic Cost of Life.* J Am Geriatr Soc. 2012 Sep;60(9):1768. PMID: 22985146
4. **Schrack JA**, Simonsick EM, Chaves PHM, Ferrucci L. *The Role of Energetic Cost in Gait Speed Decline.* J Am Geriatr Soc. 2012 Oct;60(10):1811. PMID: 23035640
5. **Schrack JA**, Simonsick EM, Ferrucci L. *The Relationship of the Energetic Cost of Slow Walking and Peak Energy Expenditure to Gait Speed in Mid-to-Late Life.* Am J of Phys Med Rehab 2013 Jan;92(1):28-35. PMID:22854908
6. Terracciano A, **Schrack JA**, Sutin AR, Chan W, Simonsick EM, Ferrucci L. *Personality, metabolic rate and aerobic capacity.* PLOS ONE 2013;8(1):e54746. doi: 10.1371/journal.pone.0054746. PMID: 23372763
7. Tanaka T, Ngwa JS, Zillikens MC, van Rooij FJA, Wojczynski MK, Dedoussis G, Frazier-Wood AC, Houston DK, Kanoni S, Lemaitre RN, Luan J, Mikkil V, Renstrom F, Sonestedt E, Zhao JH, Chu A, Qi L, Chasman D, de Oliveira Otto MCC, Dhurandhar EJ, Feitosa MF, Johansson I, Khaw KT, Lohman KK, Manichaikul A, McKweon NM, Mozaffarian D, Singleton A, Hernandez D, Stirrups K, Viikari J, Zheng Y, Bandinelli S, Barroso I, Borecki IB, Deloukas P, Forouhi NG, Hofman A, Liu Y, Lytikinen L, North KE, Wiggins KL, Dimitriou M, Hallmans G, Khnen M, Langenberg C, Ordovas JM, Uitterlinden AG, Hu FB, Kalafati I, Raitakari O, Franco OH, Johnson A, Plump AS, Emilsson V, **Schrack JA**, Semba R, Siscovick DS, Arnett DK, Borecki IB, Franks PW, Kritchevsky SB, Lehtimäki K, Loos RJF, Marju OM, Rotter JI, Wareham NJ, Witteman JCM, Ferrucci L, Cupples LA, Nettleton JA. *Common genetic variants associated with*

macronutrient intake: a meta-analysis of 12 cohorts. Am J Clin Nutr. 2013 Jun;97(6):1395-402. PMID:23636237

8. **Schrack JA**, Zipunnikov V, Goldsmith AJ, Crainiceanu CM, Simonsick EM, Ferrucci L. *Assessing the "Physical Cliff": Detailed Quantification of Physical Activity and Aging.* J Gerontol A Biol Sci Med Sci. 2014 Aug;69(8):973-9. PMID: 24336819.
9. Simonsick EM, **Schrack JA**, Glynn N, Ferrucci L. *Assessing fatigability in mobility intact older adults.* J Am Geriatr Soc 2014 Feb;62(2):347-51. PMID: 24417536.
10. **Schrack JA**, Knuth ND, Simonsick EM, Ferrucci L. *"IDEAL" aging is associated with lower resting metabolic rate: the Baltimore Longitudinal Study of Aging.* J Am Geriatr Soc 2014 Apr;62(4):667-72. PMID: 24635835.
11. Schragger M, **Schrack JA**, Simonsick EM, Ferrucci L. *The association between energy availability and physical activity in older adults.* Am J of Phys Med Rehab. 2014 Oct;93(10):876-83. PMID: 24800719
12. **Schrack JA**, Zipunnikov V, Goldsmith AJ, Bandeen-Roche K, Crainiceanu CM, Ferrucci L. *Estimating Energy Expenditure from Heart Rate in Older Adults: a Case for Calibration.* PLoS One. 2014 Apr 30;9(4):e93520. eCollection 2014. PMID: 24787146
13. Erlandson KM, **Schrack JA**, Jankowski CM, Brown TT, Campbell. *Functional Impairment, Disability, and Frailty in Adults Aging with HIV-Infection.* Curr HIV/AIDS Rep. 2014 Sep;11(3):279-90. PMID: 24966138
14. Xiao L, Huang L, **Schrack JA**, Ferrucci L, Zipunnikov V, Crainiceanu CM. *Quantifying the lifetime circadian rhythm of physical activity: a covariate-dependent functional approach.* Biostatistics. 2014 Oct 30. PMID: 25361695
15. *Fabbri E, An Y, **Schrack JA**, Gonzales-Freire M, Zoli M, Simonsick EM, Guralnik JM, Boyd CM, Studenski S, Ferrucci L. *Energy metabolism and the burden of multi-morbidity in older adults. Results from the Baltimore Longitudinal Study of Aging.* J Gerontol A Biol Sci Med Sci. 2014 Nov 18. PMID: 25409892
16. Goldsmith J, Zipunnikov V, **Schrack JA**. *Generalized multilevel functional-on-scalar regression and principal component analysis.* Biometrics. 2015 Jan 25. PMID: 25620473
17. **Schrack JA**, Zipunnikov V, Crainiceanu C. *Electronic devices and applications to track physical activity.* JAMA. 2015 May 26;313(20):2079-80. PMID:26010643
18. **Schrack JA**, Althoff KN, Jacobson LP, Erlandson KM, Jamieson BD, Koletar SL, Phair J, Ferrucci L, Brown TT, Margolick JB. *Accelerated Longitudinal Gait Speed Decline in HIV-Infected Older Men.* JAIDS, 2015 Dec 1;70(4):370-6. PMID: 26102450

19. **Schrack JA**, Zipunnikov V, Simonsick EM, Studenski S, Ferrucci L. *Rising Energetic Cost of Walking Predicts Gait Speed Decline with Aging*. J Gerontol A Biol Sci Med Sci, 2016 Jul;71(7): 947 – 953. PMID: 26850913
20. **Schrack JA**, Cooper R, Koster A, Shiroma EJ, Murabito JM, Rejeski WJ, Ferrucci L, Harris TB. *Assessing Daily Physical Activity in Older Adults: Unraveling the Complexity of Monitors, Measures, and Methods*. J Gerontol A Biol Sci Med Sci. 2016 Aug;71(8): 1039-48. PMID: 26967472
21. *Dias JP, **Schrack JA**, Shardell M, Egan JM, Studenski S. Association of Abdominal fat with serum amylase in an older cohort: the Baltimore Longitudinal Study of Aging. Diabetes Research and Clinical Practice. 2016 Jun; 116:212-7. PMID: 27321338
22. Simonsick EM, Glynn NW, Jerome GJ, **Schrack JA**, Ferrucci L. *Fatigued but not frail: Performance fatigability as a marker of impending decline in mobility-intact older adults*. J Am Geriatr Soc. 2016 Jun; 116: 212-7. PMID: 27253228
23. Ferrucci L, Cooper R, Shardell M, Simonsick EM, **Schrack JA**, Kuh D. *Age-related change in mobility: perspectives from life course epidemiology and geroscience*. J Gerontol A Biol Sci Med Sci. 2016 Sep; 71(9): 1184-94. PMID: 26975983
24. **Schrack JA**, Jacobson LP, Althoff KN, Erlandson KM, Jamieson BD, Koletar SL, Phair J, Brown TT, Margolick JB. *Effect of HIV-Infection and Cumulative Viral Load on Age-Related Decline in Grip Strength*. AIDS. 2016 Nov 13;30(17): 2645-265. PMID: 27603294
25. Erlandson KM, Zhang L, Lake JE, **Schrack J**, Althoff K, Sharma A, Tien PC, Margolick JB, Jacobson LP, Brown TT, *Changes in Weight and Weight Distribution across the Lifespan among HIV-infected and -uninfected Men and Women*. Medicine, 2016 Nov;95(46): e5399. PMID: 27861378
26. Godino J, Appel LJ, Gross AL, **Schrack JA**, Parrinello CM, Kalyani RR, Windham BG, Pankow JS, Kritchevsky SB, Bandeen-Roche K, Selvin E. Diabetes, hyperglycemia, and the burden of functional disability among older adults in a community based study. J Diabetes, 2017 Jan;9(1):76-84. PMID: 2687713
27. Cooper R, Huang L, Hardy R, Crainiceanu A, Harris TB, **Schrack JA**, Crainiceanu C, Kuh D. *Obesity history and daily patterns of physical activity at age 60-64: findings from the MRC National Survey of Health and Development*. J Gerontol A Biol Med Sci. 2017 Feb 18. PMID: 28329086
28. Florido R, Ndumele C, Kwak L, Pang Y, Matsushita K, **Schrack J**, Lazo M, Nambi V, Blumenthal R, Folsom A, Coresh J, Ballantyne C, Selvin E. *Physical Activity, Obesity, and Subclinical Myocardial Damage*. JACC Heart Failure. 2017 May;5(5):377-384. PMID: 28449797
29. *Coyle PC, **Schrack JA**, Hicks GE. *Pain-energy model of mobility limitation in older adults*. Pain Medicine. 2017 May22. PMID: 28531299

30. **Schrack JA**, Gresham G, Wanigatunga AA. *Understanding physical activity in cancer patients and survivors: new methodology, new opportunities, and new challenges*. Cold Spring Harb Mol Case Stud. 2017 Jul 5;3(4). PMID: 28679694
31. *Nastasi AJ, McAdams-Demarco M, **Schrack JA**, Yin H, Olorundare I, Warsame F, Mountford A, Haugen CE, Fernandez MG, Segev DL. *Pre-kidney transplant lower extremity impairment and post-transplant mortality*. Am J Transplant. 2017 Jul 15. PMID: 28710900
32. *Bai J, Sun Y, **Schrack JA**, Crainiceanu C. *A two-stage model for wearable device data*. Biometrics. In Press.
33. *Nastasi AJ, Ahuja A, Zipunnikov V, Simonsick EM, Studenski S, Ferrucci L, **Schrack JA**. *Objectively measured physical activity and falls in well-functioning older adults: findings from the Baltimore Longitudinal Study of Aging*. Am J of Phys Med Rehab. In Press.
34. Gross AL, Lu H, **Schrack JA**, Meoni L, Sharrett AR. *Is physical activity in midlife good for the brain? Findings from 33 years of prospective follow-up*. Journal of Alzheimer's Disease. In Press.
35. *Wanigatunga AA, Simonsick EM, Zipunnikov V, Spira AP, Studenski SA, Ferrucci L, **Schrack JA**. *Perceived fatigability and objective physical activity in mid-to-late life*. J Gerontol A Biol Sci Med Sci. In Press

Invited Reviews:

1. Gebo KA, **Schrack JA**. *The accentuated challenges of aging with HIV*. Infectious Disease Special Edition. October 2014.

Articles Under Review:

1. Zipunnikov V, Dey D, Leroux A, Di J, Urbanek J, **Schrack JA**, Crainiceanu C. *Total physical activity and its circadian allocation are independent predictors of mortality in NHANES 2003-2006*
2. *Armstrong NM, Carlson MC, Xue QL, **Schrack JA**, Carnethon MR, Rosano C, Chaves PH, Bandeen-Roche K, Gross AL. *Subclinical cardiovascular disease, persistent depressive symptoms, and all-cause mortality: an application of causal mediation approach using survival data*.
3. *Nastasi AJ, Bryant TS, Le JT, **Schrack JA**, Ying H, Haugen CE, Gonzalez-Fernandez M, Segev DL, McAdam-DeMarco M. *Pre-kidney transplant lower extremity impairment and transplant length of stay: a time to discharge analysis*.
4. **Schrack JA**, Leroux A, Fleg J, Zipunnikov V, Simonsick EM, Studenski S, Crainiceanu C, Ferrucci L. *Using heart rate to define objectively measured physical activity intensity: one size does not fit all*.
5. Simonsick EM, Aronson B, **Schrack JA**, Hicks GE, Jerome GJ, Patel KV, Studenski SA, Ferrucci L. *Energetic Cost of Low Back Pain and Threats to Mobility: Findings from the Baltimore Longitudinal Study of Aging*.

6. *Di J, Leroux A, Urbanek J, Spira AP, **Schrack JA**, Zipunnikov V. *Methods to quantify fragmentation of accelerometry-measured physical activity.*
7. *Coyle PC, Pugliese JM, Sions JM, Eskander MS, **Schrack JA**, Hicks GE. *Energetic Impairments in Older Adults with Chronic Low Back Pain and Radiculopathy: A Cross-Sectional, Matched Comparison Study*
8. *Armstrong NM, Carlson MC, **Schrack JA**, Xur QL, Carnethon MR, Rosano C, Chaves PH, Gross AL. *Late-life depressive symptoms as partial mediators in the associations between subclinical cardiovascular disease with onset of mild cognitive impairment and dementia.*

Jennifer A. Schrack

**Curriculum Vitae
Part II**

Teaching:

Current Advisees:

Pei-Lun Kuo	PhD student, Epidemiology
Sara Alehashemi	iMPH student
Keioko Kutsuwada	iMPH student

Past Advisees:

Jenny Pena Diaz, PhD	MPH student, 2015 Capstone: <i>Association of low amylase with obesity in older adults</i>
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Anthony Nastasi	MHS student, Epidemiology, 2017 Thesis: <i>Objectively Measured Physical Activity and Falls in Well-Functioning Older Adults: Findings from the Baltimore Longitudinal Study of Aging</i>
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Pablo Martinez, MD	MHS student, Epidemiology, 2017 Thesis: <i>Association Between Ankle-Brachial Index and Objectively Measured Physical Activity and Physical Performance in the Baltimore Longitudinal Study of Aging: Cross Sectional and Longitudinal Analyses</i>
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Fellows:

Amal Wanigatunga, PhD, MPH	Postdoctoral Fellow, Department of Epidemiology (2017 -)
Pablo Martinez, MD, MHS	Postdoctoral Fellow, Department of Epidemiology (2017 -)

Research Mentees:

Kyu Hu Lee	Senior undergraduate Public Health Studies Honors Thesis student, 2016
Matthew Weinstein	Masters student, Biotechnology, 2016

Academic Committees:

Kristina Collins	Masters Student, Biomedical Physiology and Kinesiology, Simon Fraser University, 2017
Peter Coyle	Doctoral Student, Biomechanics and Movement Science, University of Delaware, 2017
Gillian Gresham	Doctoral Student, JHSPH, Epidemiology
Jiawei Bai	Doctoral Student, JHSPH, Biostatistics, 2017
Bridget Burke	Doctoral Student, JHSPH, Epidemiology, 2017
Alexandra Wennberg	Doctoral Student, JHSPH, Mental Health, 2015

Preliminary Oral Exam Participation:

Aozhou Wu	PhD Student, Epidemiology, 2017
Jordan Johns	PhD Student, Biostatistics, 2017
Nadia Chu	PhD Student, Epidemiology, 2017

Jimmy Le	PhD Student, Epidemiology, 2017
Junrui Di	PhD Student, Biostatistics, 2017
Bethany Warren	PhD Student, Epidemiology, 2016
Gillian Gresham	PhD Student, Epidemiology, 2015
Chiadi Ndumele	PhD Student, Epidemiology, 2015
Nicole Armstrong	PhD Student, Epidemiology, 2015
Bridget Burke	PhD Student, Epidemiology, 2015
Alexandra Wennberg	PhD Student, Mental Health, 2014
Cherise Wong	PhD Student, Epidemiology, 2013

Final Oral Exam Participation:

Peter Coyle	PhD Candidate, Biomechanics and Movement Science, University of Delaware, 2017
Jiawei Bai	PhD Candidate, Biostatistics, 2017
Nicole Armstrong	PhD Candidate, Epidemiology, 2017
Vijay Varma	PhD Candidate, Mental Health, 2015
Sarah Godby Vail	PhD Candidate, Health, Behavior and Society, 2015
Alexandra Wennberg	PhD Candidate, Mental Health 2015
Alexandra Kueider	PhD Candidate, Mental Health 2014

Masters Thesis Participation:

Kristina Collins	Masters Student, Biomedical Physiology and Kinesiology, Simon Fraser University, 2017
Ximin Li	ScM Student, Biostatistics, 2014
Bing He	ScM Student, JHSPH, Biostatistics, 2013

Classroom Instruction:

		<u>Enrollment</u>
2012 – 2017	Instructor, Honors Thesis in Public Health 280.495, JHU/JHSPH	15-40 students
2012 - 2017	Instructor, Epidemiology of Aging 340.616, JHSPH	15-20 students
2012 – 2013	Instructor, Nutrition Concepts and Controversies 280.316, JHU	75 students
2011 – 2012	Co-Instructor, Honors Thesis in Public Health 280.495, JHU/JHSPH	10-15 students
2009 – 2016	Instructor, JHU Geriatrics Summer MSTARs Scholars Program	15-20 students

Research Grant Participation:

Current:

1. Title: Objectively Measured Physical Activity as an Early Indicator of Alzheimer’s Disease
Agency: JHU Catalyst Award
Period: 07/01/2017 – 06/30/2018
Amount: \$75,000

Role: Principal Investigator of a project to investigate associations among accelerometry-derived metrics of physical activity, and Alzheimer's pathology in older adults using data from the Atherosclerosis Risk in Communities Study

2. Title: Defining and Quantifying Fatigability in Functionally Independent Older Adults
Agency: NIA (R21AG052198-01, PI: Schrack)
Period: 09/01/2016 – 04/30/2018
Effort: 30%
Role: Principal Investigator of a R21 exploratory grant to delineate mechanisms of fatigability in older cancer patients and survivors participating in the Baltimore Longitudinal Study of Aging
3. Title: Fatigability Supplement to JHU Older Americans Independence Center
Agency: NIA (P30AG021334-14S1, PI: Walston)
Period 09/01/2016 – 06/30/2018
Effort: 15%
Role: Principal Investigator of an ancillary supplement to the JHU Pepper Center to delineate mechanisms of fatigability and frailty in older adults participating in the Baltimore Longitudinal Study of Aging
4. Title: Vitamin D Supplements to Prevent Falls in Older Adults: A Dose-Response Trial
Agency: NIA (U01AG047837, PI: Appel)
Period: 07/01/2014-06/30/2020
Effort: 15%
Role: Co-investigator of a clinical trial of Vitamin D and falls/physical function in older adults
Principal Investigator of an ancillary study to conduct objective physical activity assessments in participants of the parent study (supplement: \$100,000)
5. Title: Aging, Cognition, and Hearing Evaluation in Elders (ACHIEVE) Randomized Trial
Agency: NIA (R01AG055426), PI: Lin)
Period: 05/01/2017 – 3/31/2022)
Effort: 10%
Role: Co-investigator of a clinical trial of hearing loss and cognition in older adults
6. Title: Multicenter AIDS Cohort Study (Baltimore Center)
Agency: NIAID (U01AI035042-25, PIs: Margolick, Brown)
Period: 04/01/1993 - 03/31/2019
Effort: 10%
Role: Co-investigator of a study to understand the natural history of HIV infection in men who have sex with men
7. Title: Monitoring and Improving Patient Recovery after Cardiac Surgery Using Activity Monitors
Agency: JHU InHealth (PI: Brown)
Period: 01/04/2016 – 12/31/2017
Amount: \$74,900

Role: Co-Investigator of an individualized health pilot study to monitor trajectories of mobility recovery in post-operative cardiac patients using accelerometers

8. Title: Pilot trial to Increase Physical Activity in Glaucoma Patients
Agency: JHU Ophthalmology (PI: Ramulu)
Period: 2016 – 2018
Amount: \$50,000
Role: Co-Investigator of an intervention to increase daily physical activity in glaucoma patients using wearable technology

Pending:

9. Title: Energy Expenditure, Physical Activity, and Alzheimer’s Disease in the Baltimore Longitudinal Study of Aging
Agency: NIA (R01AG12327657, PI: Schrack)
Period: 2017 - 2022
Effort: 40%
Role: Principal Investigator of a project is to establish the associations among energy reserves, physical activity, and Alzheimer’s pathology in older adults using data from the Baltimore Longitudinal Study of Aging

Completed:

10. Title: Energy Expenditure and Aging with HIV: Effects on functional longevity
Agency: NIA (K01AG048765, PI: Schrack)
Period: 6/30/2014 – 6/30/2017
Effort: 50%
Role: Principal investigator of an ancillary study on aging, energy expenditure, & functional decline in MSM aging with HIV within the Multicenter AIDS Cohort Study
11. Title: Intramural Research Program Government Contractor
Agency: NIA (HHSN311201300177P, PI: Schrack)
Period: 2014 – 2017
Effort: 12%
Role: Co-investigator of energetics and accelerometry measures in the Baltimore Longitudinal Study of Aging
12. Title: Johns Hopkins Center for AIDS Research
Agency: NIAID (1P30AI094189 -01A1, PI: Chaisson)
Period: 2014 – 2017
Amount: \$50,000
Role: Principal Investigator of a scholar grant to study HIV and functional decline in the MACS
13. Title: Quantitative Assessment of Caregiving and Free-Living Physical Activity in Stroke Survivors
Agency: NIA (P30AG048773, PI: Roth)
Period: 2015-2016

Amount: \$40,000

Role: Principal Investigator of a pilot study to investigate the effects of a physical activity intervention in stroke survivors with caregivers

14. Title: Epidemiology & Biostatistics of Aging Training Grant

Agency: NIA (T32AG000247, PI: Bandeen-Roche)

Period: 08/01/2007 – 05/30/2011

Role: Candidate/Trainee on an institutional training award designed to train predoctoral and postdoctoral candidates to lead the next generation of quantitative research scientists addressing the health of our aging population

Service / Leadership:

- 2017 Judge, Tenth Annual Research on Aging Showcase Poster Competition
- 2016 - Co-director, Epidemiology and Biostatistics of Aging Training Grant, JHSPH
- 2016 Invited Panelist, Writing Successful K Applications: Beyond the Basics Workshop, JHMI, April 2016
- 2016 Judge, Ninth Annual Research on Aging Showcase Poster Competition
- 2015 Principal organizer/coordinator, “JHSPH Centennial Step Challenge – Let’s Get Moving!”
- 2015 - Co-founder/director, Cardiovascular Disease and Aging mHealth Interest Group, JHSPH/JHMI
- 2015 Judge, Eighth Annual Research on Aging Showcase Poster Competition
- 2015 - 2017 Department of Epidemiology Comprehensive Exam Committee, JHSPH
- 2014 - Co-faculty sponsor, Geriatrics Fellows Professional Development Series, JHMI
- 2014 Co-convener, Pre-conference workshop on accelerometry methodology, Gerontological Society of America Annual Meeting
- 2013 - Gerontology Certificate Steering Committee, JHSPH
- 2013 Invited Panelist, National Graduate Student Research Conference, National Institutes of Health
- 2012 - Public Health Studies Academic Advisory Committee, JHU/JHSPH
- 2012 Moderator, Undergraduate Workshop on Research, Public Health Studies Research Symposium

2007 – 2011 Founding member, JHSPH Gerontology Interest Group Student Advisory Committee

2009 – 2010 Epidemiology Student Organization Representative to the Faculty, JHSPH

Presentations:

Scientific Meetings:

1. *More than Counts and Cutpoints: New Insights into Accelerometry Derived Metrics for Older Adults.* International Association of Geriatrics and Gerontology, San Francisco, CA, July 2017. Role: Session Chair
2. *Predicting VO2 Max Using Accelerometry and Heart Rate Metrics.* International Association of Geriatrics and Gerontology, San Francisco, CA, July 2017. Role: Session Co-Chair & Presenter
3. *Monitoring and improving patient recovery after cardiac surgery using activity monitors.* 5th International Conference on Ambulatory Monitoring of Physical Activity and Movement, Bethesda, MD, June, 2017. Role: Presenter
4. *Fragmentation of physical activity is more strongly associated with gait speed and fatigability than total volume of daily physical activity.* Claude D. Pepper Older Americans Independence Center 2017 Annual Meeting, Arlington, VA, March 2017. Role: Presenter
5. *Measurement of Physical Activity, Sedentary Behavior and Sleep in Alzheimer's Disease.* The Gerontological Society of American Annual Meeting, New Orleans, LA, November 2016. Role: Invited Session Discussant
6. *Declining Walking Efficiency Predicts Greater Perceived Fatigability with Aging.* Presidential Symposium, Health Sciences Section, The Gerontological Society of American Annual Meeting, New Orleans, LA, November 2016. Role: Presenter
7. *Getting to the Heart of the Matter: Using Heart Rate to Define Physical Activity Intensity in Older Adults.* Measurement, Statistics, and Research Design Special Interest Group Sponsored Symposium, The Gerontological Society of American Annual Meeting, New Orleans, LA, November 2016. Role: Session Chair and Presenter
8. *HIV-Infection attenuates the age-associated decline in resting metabolic rate.* 7th HIV & Aging Workshop, Washington D.C., September 2016. Role: Presenter
9. *The Physiology of Fatigability, Energy Regulation, and Functional Decline.* Workshop on Pathways, Contributors, and Correlates of Functional Impairments Across Specialties, Washington, DC August 2016. Role: Presenter

10. *Quantifying Longitudinal Patterns and Trends of Objectively Measured Physical Activity Across the Age Spectrum*. American College of Sports Medicine Annual Meeting, Boston, MA, June 2016. Role: Presenter
11. *Effect of HIV infection and cumulative viral load on age-related decline in grip strength*. New York Academy of Sciences Disease Drivers of Aging Summit, New York, NY, April 2016. Role: Presenter
12. *Quantifying physical activity in mid-to-late life*. International Biometric Society Eastern North America Region Annual Scientific Meeting, Austin, TX, March 2016. Role: Invited Presenter
13. *Objectively measured physical activity in aging populations: a global perspective*. The Gerontological Society of America Annual Scientific Meeting, Orlando, FL, November 2015. Role: Session Chair and Presenter.
14. *Rising serum IL-6 predicts declining walking efficiency in mid-to-late life*. The Gerontological Society of America Annual Scientific Meeting, Orlando, FL, November 2015. Role: Presenter
15. *Aging related strength decline is accelerated in HIV-Infected Men*. 6th HIV & Aging Workshop, Washington D.C., October 2015. Role: Presenter
16. *Performance fatigability and free-living activity in mid-to-late life*. The American College of Sports Medicine Annual Scientific Meeting, San Diego, CA, May 2015. Role: Presenter
17. *Quantifying sedentary behavior in older populations using counts and cutpoints*. The Gerontological Society of America Annual Scientific Meeting, Washington DC, November 2014. Role: Session Chair and Presenter
18. *Sex differences in physical activity: beyond the basics*. The Gerontological Society of America Annual Scientific Meeting, Washington DC, November 2014. Role: Session Chair and Presenter
19. *Assessing daily activity in old age: unraveling the complexity of monitors, measures, and methods*. The Gerontological Society of America Annual Scientific Meeting Preconference Workshop, Washington DC, November 2014. Role: Co-convener and Presenter
20. *Accelerated decline in gait speed in HIV-infected older adults*. 5th HIV & Aging Workshop, Baltimore, MD, October 2014. Role: Presenter
21. *Accelerated decline in gait speed in HIV-infected older adults*. HIV & Aging Conference, Decatur GA, October 2014. Role: Presenter
22. *Modeling the "Physical Cliff" with Objective Activity Assessment: Findings from the BLSA*. The Gerontological Society of America Annual Scientific Meeting, New Orleans, LA, November 2013. Role: Session Chair and Presenter

23. *Insight into Fatigability Through Energetic Efficiency and Free-Living Activity in Mid-to-Late Life.* The Gerontological Society of America Annual Scientific Meeting, New Orleans, LA, November 2013. Role: Presenter
24. *Greater Energetic Cost of Walking Predicts Longitudinal Gait Speed Decline With Age.* The Gerontological Society of America Annual Scientific Meeting, New Orleans, LA, November 2013. Role: Presenter
25. *Impaired Glucose Metabolism as an Indicator of Walking Efficiency.* The Gerontological Society of America Annual Scientific Meeting, San Diego, CA, November 2012. Role: Presenter
26. *Estimating Energy Expenditure from Heart Rate in Older Adults: a Case for Calibration.* National Institute on Aging Intramural Research Retreat, April 2012. Role: Presenter
27. *Walking Efficiency as an Indicator of Fatigability and Risk Factor for Mobility Limitation.* The Gerontological Society of America Annual Scientific Meeting, November 2011. Role: Presenter
28. *Walking Speed and Energetic Efficiency in Older Adults.* The Gerontological Society of America Annual Scientific Meeting, November 2010. Role: Presenter
29. *Energy Availability and Walking Speed: a Key to Mobility?* The American College of Sports Medicine Annual Meeting, June 2010. Role: Presenter
30. *Energy Availability and Walking Speed in the BLSA.* National Institute on Aging Intramural Research Retreat, April 2010. Role: Presenter
31. *Short on Fuel? Aging and the Conservation of Energy.* International Conference on Gait and Mental Function, February 2010. Role: Presenter
32. *Aging and the Conservation of Energy.* National Institute on Aging Intramural Retreat, April 2009. Role: Presenter
33. *Short on Fuel? Measured Energy Availability and Perceived Fatigue.* The Gerontological Society of America Annual Meeting, November 2008. Role: Presenter
34. *Validation of the Cosmed K4 b² Portable Metabolic System in Measuring Steady State Walking Energy Expenditure.* The American College of Sports Medicine Annual Meeting, May 2008. Role: Presenter
35. *Assessing the Physiological Basis of Fatigue.* National Institute on Aging Intramural Retreat, April 2008. Role: Presenter

Invited Seminars:

1. *Physical Activity & Beyond: Using Accelerometers to Understand Health, Function, and Physiology with Aging,* National institute on Aging Summer Scientific Retreat, Bethesda, MD, June 2017.

2. *Quantifying and defining fatigability in functionally independent older adults.* Division of Geriatrics and Clinical Gerontology, National Institute on Aging, Bethesda, MD, October 2016.
3. *The Issue is: How can we use Accelerometers to Better Understand Mobility in Older Adults?* Johns Hopkins School of Nursing, Baltimore, MD, May 2016.
4. *Digital Exposomics & Physical Activity: What are we really measuring?* American Association for Cancer Research Annual Meeting, New Orleans, LA, April 2016.
5. *Epidemiologic Perspectives on Aging, Energy Expenditure, and Accelerometry,* University of Florida Institute on Aging, Clinical Translational Aging Research Seminar Series, Gainesville, FL, January 2016.
6. *Physical Activity and Older Adults: What do we really know?* Division of Geriatric Medicine, Johns Hopkins School of Medicine, Baltimore, MD, October 2015.
7. *Using Technology to Assess Physical Activity: How Active Are You?* Johns Hopkins Bloomberg School of Public Health, Department of Mental Health, Baltimore, MD, September 2015.
8. *Physical Activity and Energetics from Mid-to-Late Life.* Longitudinal Studies: Maximizing their Value for Aging Research, Wellcome Trust Scientific Conferences, Wellcome Trust Genome Campus, Hinxton, UK, July 2015.
9. *The Epidemiology of Aging Energetics: Assessing Function through Physiology.* MRC Unit for Lifelong Health and Aging at University College London, London, UK, July 2015.
10. *The Epidemiology of Aging, Energetics, and Accelerometry: Findings from the BLSA.* Longitudinal Studies Section, Translational Gerontology Branch, National Institute on Aging, Baltimore, MD, June 2015.
11. *Longitudinal Grip Strength Decline is Accelerated in HIV-Infected Older Men.* Johns Hopkins University Center for AIDS Research Annual Meeting, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, June 2015.
12. *Modeling the "Physical Cliff" with Objectively Measured Physical Activity: Findings from the BLSA,* National Institutes of Health Exercise Interest Group, Bethesda, MD, May 2015
13. *The Epidemiology of Physical Activity: How Active Are You?* Physical Medicine and Rehabilitation Laboratory, Johns Hopkins School of Medicine, Baltimore, MD, March 2015.
14. *Energy Expenditure and Aging with HIV: Effects on Functional Longevity.* Johns Hopkins University Center for AIDS Research Providers Meeting, Johns Hopkins School of Medicine, Baltimore, MD, March 2015.

15. *Objective Assessment of Physical Activity Using Accelerometers*. Department of Kinesiology, College of Health Professions, Towson University, Towson, MD, February 2015.
16. *Assessing physical activity in older adults: the complexity of monitors, measures, and methods*. Welch Center Grand Rounds, Division of Internal Medicine, Johns Hopkins School of Medicine, Baltimore, MD, October 2014.
17. *Aging, HIV, and Functional Decline in the MACS*. Women's Interagency HIV Study / Multicenter AIDS Cohort Study Joint Annual Meeting, National Institutes of Health, Bethesda, MD, May 2014.
18. *Energy Expenditure and Aging with HIV: Effects on Functional Longevity*. Johns Hopkins University Center for AIDS Research Annual Meeting, Johns Hopkins School of Medicine, Baltimore, MD, May 2014.
19. *The Epidemiology of Physical Aging: Functional Considerations*. Endocrinology Grand Rounds, Johns Hopkins School of Medicine, Baltimore, MD, October 2013.
20. *The Epidemiology of Aging, Energetics, and Accelerometry*. Laboratory of Population Sciences, National Institute on Aging, Bethesda, MD, September 2013.

Meeting abstracts and presentations

(included only where senior author or served as advisor/mentor (*)):

1. *Nastasi AJ, Ahuja A, Zipunnikov V, Simonsick EM, Studenski S, Ferrucci L, **Schrack JA**. *Objectively measured physical activity and falls in well-functioning older adults: findings from the Baltimore Longitudinal Study of Aging*, Research on Aging Showcase, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, May 2016.
2. *Kuo P, Zipunnikov V, Di J, Wanigatunga AA, Simonsick EM, Studenski S, Ferrucci L, **Schrack JA**. *Fragmentation of physical activity is more strongly associated with gait speed and fatigability than total volume of daily physical activity*, International Conference on Ambulatory Monitoring of Physical Activity and Movement, Bethesda, MD, June 2017.
3. Knuth ND, Caro SR, Walter M, **Schrack JA**. *Relationship between Chronic Inflammation and Objectively Measure Physical Activity in Older Adults*, International Association of Geriatrics and Gerontology, San Francisco, CA, July 2017.
4. *Kuo P, Zipunnikov V, Di J, Wanigatunga AA, Simonsick EM, Studenski S, Ferrucci L, **Schrack JA**. *Fragmentation of physical activity is more strongly associated with gait speed and fatigability than total volume of daily physical activity*, International Association of Geriatrics and Gerontology, San Francisco, CA, July 2017.

Personal Statement:

I am an epidemiologist with a primary research focus on the role of physiological factors in maintaining physical activity and functional independence at older ages. My extensive clinical and research experience

as an exercise physiologist with an emphasis on the assessment of gait speed, physical activity, and energy expenditure in older populations makes me uniquely qualified to bridge the fields of kinesiology, epidemiology, and gerontology. I have established interdisciplinary collaborative relationships with aging, HIV, methodological, and clinical researchers through my work at the Johns Hopkins Center on Aging and Health (COAH), and with the National Institute on Aging's Baltimore Longitudinal Study of Aging (BLSA), the Johns Hopkins Statistical Methods and Applications for Research in Technology (SMART) group, and the Johns Hopkins Center for AIDS Research.

Physical Function and Energetics Research: The capacity to walk is a central component of independent living. Although the age-related decline in gait speed has been well documented in the scientific literature, the underlying factors contributing to this decline are not well understood. As reserve and resiliency decrease with aging, increases in the energetic cost of living – both at rest and during functional tasks – may contribute to age-related declines in gait speed and physical activity. My work in this area demonstrates a direct link between energy regulation and the subclinical onset of diseases and conditions, manifesting as higher resting metabolic rate, decreased walking efficiency, and greater fatigue burden. These findings suggest that strategies to maintain metabolic efficiency hold significant implications for maintaining mobility in late life, and that efforts to curb threats to walking efficiency should focus on therapies to treat age-related gait impairments and reduce clinical disease burden. As a PhD student (2007-2011) and NIA pre-doctoral fellow, I was responsible for designing and implementing multiple measures of energy expenditure into the BLSA, the NIA's premiere clinical research program. Based on the scientific success of these metrics, they have become part of the regular core assessments of the BLSA, and contributed to the success of a recently funded R21 award, "Defining and Quantifying Fatigability in Functionally Independent Older Adults."

Accelerometry Research: Physical activity is paramount to health and wellness throughout life, and central to mobility with aging. Although physical activity has been historically difficult to measure, the advent of mobile technology (e.g. accelerometers) affords unique opportunities to quantify daily physical activity in the free-living environment, particularly at lower thresholds of movement/activity consistent with older populations. However, with these new opportunities come methodological challenges associated with: (i) managing and quantifying high-density data, (ii) developing new epidemiologic and statistical methodology for physical activity that is specific to older populations, and (iii) interpreting this methodology into meaningful recommendations to extend functional health and longevity in older adults. In collaboration with the JHSPH SMART group, I have been working to establish methods to analyze and translate heart rate and accelerometry data into accurate and reliable measures of physical activity in older populations. This work is crucial to understanding changes in energy expenditure and physical function with aging and for managing and treating chronic conditions in older adults. My work in this area demonstrates that traditional physical activity metrics were developed and validated in younger, healthier populations, and highlights the need for new approaches to quantify and define physical activity in older adults. As part of this work, I have chaired four accelerometry methods symposia at the Gerontological Society of America annual meetings in 2013 – 2016, and co-convoked a pre-conference workshop in 2014 on "Assessing Daily Activity in Old Age: Unraveling the Complexity of Monitors, Measures, and Methods," which resulted in a seminal paper published in *Journals of Gerontology: Medical Sciences* (the official Journal of the Gerontological Society of America) in 2016.

Keywords: accelerometry, aging, energy expenditure, gait speed, physical activity, physical function