
BIOGRAPHICAL SKETCH

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NAME: Travison, Thomas G.

eRA COMMONS USER NAME:TTRAVISON

POSITION TITLE: Senior Scientist, Assistant Professor

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date	FIELD OF STUDY
Skidmore College, Saratoga Springs, NY	BA	06/1997	Mathematics
Johns Hopkins School of Public Health, Baltimore, MD	PhD	05/2002	Biostatistics

A. Personal Statement

I am a biostatistician and clinical trialist whose work is focused on physical functioning and cardiometabolic health in older adults. I am currently Senior Scientist and Director of Biostatistics at the Institute for Aging Research at Hebrew SeniorLife and Assistant Professor of Medicine at Harvard Medical School. I additionally co-direct the Program on Clinical Trails at IFAR, and am Core Leader of the Biostatistical Design and Analysis Core within the Boston Pepper Older Americans Independence Center (PI: S. Bhasin). I have designed and analyzed numerous observational studies and intervention trials with focus on illnesses of aging, and particular focus on sex steroids epidemiology and its relation to loss of functional independence in older adults, including leading the first large prospective analysis of symptomatic androgen deficiency among community-dwelling men. Under the auspices of the Boston OAIC and the IFAR programs I have formally and informally mentored numerous epidemiologic, quantitative and clinical scientists in their development and training. I have been recognized nationally and internationally for expertise in quantitative models of circulating androgens and the epidemiology of aging. I co-chaired the Clinical trial Design and Implementation working group of the NIA / CTSA collaborative task force on the utility of multimodality therapies for geriatric mobility limitation, and am biostatistician for the Endocrine Society's PATH initiative for development of reference ranges for male human androgens. I am the recipient of an International Visiting Research Fellowship at the University of Sydney's ANZAC institute, and serve as an independent statistical monitor and Data Safety Monitoring Board (DSMB) member on projects locally, nationally and internationally.

1. Storer TW, Miciek R, **Travison TG**. Muscle function, physical performance and body composition changes in men with prostate cancer undergoing androgen deprivation therapy. *Asian J Androl*. 2012 Mar;14(2):204-21. doi: 10.1038/aja.2011.104. Epub 2012 Feb 27. Review. PubMed PMID: 22367184; PubMed Central PMCID: PMC3735097.
2. **Travison TG**, Shackelton R, Araujo AB, Hall SA, Williams RE, Clark RV, O'Donnell AB, McKinlay JB. The natural history of symptomatic androgen deficiency in men: onset, progression, and spontaneous remission. *J Am Geriatr Soc*. 2008 May; 56(5):831-9.
3. **Travison TG**, Basaria S, Storer TW, Jette AM, Miciek R, Farwell WR, Choong K, Lakshman K, Mazer NA, Coviello AD, Knapp PE, Ulloor J, Zhang A, Brooks B, Nguyen AH, Eder R, LeBrasseur N, Elmi A, Appleman E, Hede-Brierley L, Bhasin G, Bhatia A, Lazzari A, Davis S, Ni P, Collins L, Bhasin S. Clinical meaningfulness of the changes in muscle performance and physical function associated with testosterone administration in older men with mobility limitation. *J Gerontol A Biol Sci Med Sci*. 2011 Oct;66(10):1090-9. Doi 10.1093/gerona/glr100. Epub 2011 Jun 22. PubMed PMID: 21697501; PubMed Central PMCID: PMC3202898.

4. **Travison TG**, Araujo AB, O'Donnell AB, Kupelian V, McKinlay JB. A population-level decline in serum testosterone levels in American men. *J. Clin. Endocrinol. Metab.* 2007 Jan;92(1):196–202.
5. **Travison TG**, Nguyen A-H, Naganathan V, Stanaway FF, Blyth FM, Cumming RG, Le Couteur DG, Sambrook PN, Handelsman DJ. Changes in reproductive hormone concentrations predict the prevalence and progression of the frailty syndrome in older men: the concord health and ageing in men project. *J. Clin. Endocrinol. Metab.* 2011 Aug;96(8):2464–74.

B. Positions and Employment

Positions and Employment

1999-2000	Instructor, Johns Hopkins Summer Institute of Epidemiology and Biostatistics, JHSPH
2000-2001	Instructor, Biostatistics, University of Helsinki, Helsinki, Finland
2002-2003	Biostatistician/Senior Biostatistician, Wyeth Research; Cambridge, MA.
2003-2005	Assistant Professor, The New England College of Optometry, Boston, MA
2005-2009	Research Scientist / Senior Research Scientist, New England Research Institutes (NERI), Inc., Watertown, MA
2009-2012	Assistant Professor, Departments of Medicine and Biostatistics Boston University Schools of Medicine and Public Health Chief Biostatistician, Section of Endocrinology, Boston Medical Center
2012-2014	Assistant Professor of Medicine, Harvard Medical School Chief Biostatistician, Research Program on Men's Health, Aging and Metabolism, Brigham and Women's Hospital, Boston, MA
2014-	Senior Scientist, Institute for Aging Research, Hebrew SeniorLife, Roslindale, MA Director, Biostatistics, Hebrew SeniorLife, Roslindale, MA Assistant Professor of Medicine, Harvard Medical School, Boston, MA

Honors

1997	Phi Beta Kappa
1999	Helen Abbey Award for Excellence in Teaching (Johns Hopkins SPH)
2002	Margaret Merrell Award for Excellence in Academic Research (JHSPH)
2003	Kappa Delta Award for Outstanding Orthopaedic Research, American Academy of Orthopaedic Surgeons
2006	Special Achievement Award for Collaborative Research (NERI)
2009-10	International Visiting Research Fellowship, University of Sydney ANZAC Institute

C. Contributions to Science

1. **Epidemiology of sex steroid changes and androgen insufficiency in older men.** My early work focused on patterns of and contributors to sex steroid changes in men with aging. Though the relation of circulating hormone levels to multimorbidity, musculoskeletal health and health behaviors had previously been studied in community-dwelling men, longitudinal and comprehensive analyses of the contributors to intra- and inter-individual variation in these factors was limited. Our attention to this area resulted in a series of analyses and publications of data from the Massachusetts Male Aging Study, on which I also served as an investigator and lead statistician. These included but were not limited to the first published observation of secular (cohort) changes in circulating androgen concentrations in American men [**reference a.** below], a finding since replicated in European cohorts as well; the first published longitudinal study of within-subject changes in the presence of symptomatic androgen insufficiency conforming to Endocrine Society guidance for diagnosis [**reference b.**], documenting the under-recognized intra-subject variation in this condition and its potential for apparent spontaneous remission with time; the first relative quantification of the contributions of aging, multimorbidity and health behaviors to intra-subject variation in hormone levels with time [**reference c.**]; and the first study examining the rate of progression and potential for remission of 'normal' (by self-report) erectile

functioning among community-dwelling men [**reference d.**]. Together these and other investigations have advanced our understanding of the epidemiology and endocrinology of aging in adult male populations and informed epidemiological and clinical guidance in this area.

- a. **Travison TG**, Araujo AB, O'Donnell AB, Kupelian V, McKinlay JB. A population-level decline in serum testosterone levels in American men. *J. Clin. Endocrinol. Metab.* 2007 Jan;92(1):196–202.
- b. **Travison TG**, Shackelton R, Araujo AB, Hall SA, Williams RE, Clark RV, O'Donnell AB, McKinlay JB. The natural history of symptomatic androgen deficiency in men: onset, progression, and spontaneous remission. *J Am Geriatr Soc.* 2008 May; 56(5):831–9.
- c. **Travison TG**, Araujo AB, Kupelian V, O'Donnell AB, McKinlay JB. The relative contributions of aging, health, and lifestyle factors to serum testosterone decline in men. *J. Clin. Endocrinol. Metab.* 2007 Feb;92(2):549–55.
- d. **Travison TG**, Shabsigh R, Araujo AB, Kupelian V, O'Donnell AB, McKinlay JB. The natural progression and remission of erectile dysfunction: results from the Massachusetts Male Aging Study. *J Urol.* 2007 Jan;177(1):241-6; discussion 246. PubMed PMID: 17162054.

2. **Observational studies of frailty and falls risk in older men and women.** A parallel interest in my work has been on the epidemiology of frailty, physical functioning and musculoskeletal health in older men. The contributions of androgen changes and sensitivity to the development and progression of frailty, a generalized vulnerability to loss of homeostasis with aging that is related to but conceptually independent of multimorbidity, has been one focus of this work [**references a. and b. below**]. More recently, we have conducted detailed analyses of subcohort variation in fall risk in community-dwelling older individuals [**reference c.**] and the potential for antihypertensive medication use to modify this risk [**reference d.**]. These investigations have collectively advanced our understanding of the potential contributions of hormonal changes to the incidence and progression of physical frailty, while providing complementary and potentially corrective information to inform the clinical management of falls risk among individuals using hypertensive medications.

- a. **Travison TG**, Nguyen AH, Naganathan V, Stanaway FF, Blyth FM, Cumming RG, Le Couteur DG, Sambrook PN, Handelsman DJ. Changes in reproductive hormone concentrations predict the prevalence and progression of the frailty syndrome in older men: the concord health and ageing in men project. *J Clin Endocrinol Metab.* 2011 Aug;96(8):2464-74. doi: 10.1210/jc.2011-0143. Epub 2011 Jun 15. PubMed PMID: 21677041.
- b. **Travison TG**, Shackelton R, Araujo AB, Morley JE, Williams RE, Clark RV, McKinlay JB. Frailty, serum androgens, and the CAG repeat polymorphism: results from the Massachusetts Male Aging Study. *J Clin Endocrinol Metab.* 2010 Jun;95(6):2746-54. doi: 10.1210/jc.2009-0919. Epub 2010 Apr 21. PubMed PMID: 20410235; PubMed Central PMCID: PMC2902073.
- c. Tchalla AE, Dufour AB, **Travison TG**, Habtemariam D, Iloputaife I, Manor B, Lipsitz LA. Patterns, predictors, and outcomes of falls trajectories in older adults: the MOBILIZE Boston Study with 5 years of follow-up. *PLoS One.* 2014 Sep 3;9(9):e106363. doi: 10.1371/journal.pone.0106363. eCollection 2014. PubMed PMID: 25184785; PubMed Central PMCID: PMC4153626.
- d. Lipsitz LA, Habtemariam D, Gagnon M, Iloputaife I, Sorond F, Tchalla AE, Dantoine TF, **Travison TG**. Reexamining the Effect of Antihypertensive Medications On Falls in Old Age. *Hypertension.* 2015 May 4. pii: HYPERTENSIONAHA.115.05513. [Epub ahead of print] PubMed PMID: 25941341.

3. **Relation of male testosterone levels, androgen insufficiency, and androgen supplementation to cardiometabolic health and physical function.** Following our work eliciting secular and within-subject trends in androgens and androgen insufficiency, we have assessed the relation between circulating androgen concentrations and downstream diabetes and other illnesses [**references a. – c. below**], and potential mediation of these effects along the pathway of insulin resistance [**reference d.**] Many of these investigations were conducted in collaboration with the principal investigator on this application (Dr. Basaria).

- a. Bhasin S, Pencina M, Jasuja GK, **Travison TG**, Coviello A, Orwoll E, Wang PY, Nielson C, Wu F, Tajar A, Labrie F, Vesper H, Zhang A, Ulloor J, Singh R, D'Agostino R, Vasani RS. Reference

ranges for testosterone in men generated using liquid chromatography tandem mass spectrometry in a community-based sample of healthy nonobese young men in the Framingham Heart Study and applied to three geographically distinct cohorts. *J Clin Endocrinol Metab.* 2011 Aug;96(8):2430-9. doi: 10.1210/jc.2010-3012. Epub 2011 Jun 22. PubMed PMID: 21697255; PubMed Central PMCID: PMC3146796.

- b. Storer TW, Miciek R, **Travison TG**. Muscle function, physical performance and body composition changes in men with prostate cancer undergoing androgen deprivation therapy. *Asian J Androl.* 2012 Mar;14(2):204-21. doi: 10.1038/aja.2011.104. Epub 2012 Feb 27. Review. PubMed PMID: 22367184; PubMed Central PMCID: PMC3735097.
- c. Bhasin S, **Travison TG**, Storer TW, Lakshman K, Kaushik M, Mazer NA, Ngyuen AH, Davda MN, Jara H, Aakil A, Anderson S, Knapp PE, Hanka S, Mohammed N, Daou P, Miciek R, Ulloor J, Zhang A, Brooks B, Orwoll K, Hede-Brierley L, Eder R, Elmi A, Bhasin G, Collins L, Singh R, Basaria S. Effect of testosterone supplementation with and without a dual 5 α -reductase inhibitor on fat-free mass in men with suppressed testosterone production: a randomized controlled trial. *JAMA.* 2012 Mar 7;307(9):931-9. doi: 10.1001/jama.2012.227. PubMed PMID: 22396515.
- d. Bhasin S, Jasjua GK, Pencina M, D'Agostino R Sr, Coviello AD, Vasani RS, **Travison TG**. Sex hormone-binding globulin, but not testosterone, is associated prospectively and independently with incident metabolic syndrome in men: the framingham heart study. *Diabetes Care.* 2011 Nov;34(11):2464-70. doi: 10.2337/dc11-0888. Epub 2011 Sep 16. PubMed PMID: 21926281; PubMed Central PMCID: PMC3198304.

4. **Intervention studies to promote physical functioning in older adults.** Our recent work has focused on the development of function-promoting therapies for use in older adults; my collaborative work in this area has focused on the design and analysis of clinical intervention studies in this area and on the estimation of anchor-based clinically meaningful differences denoting functional improvement sufficient for participant perception of improvement. Collectively these investigations have greatly advanced the development of anabolic and other therapies for functional improvement in older adults; substantially broadened our understanding of the safety and efficacy of the use of anabolic agents in older populations; and demonstrated the need for and feasibility of the use of multimodal intervention strategies for the promotion of functional improvement.

- a. **Travison TG**, Basaria S, Storer TW, Jette AM, Miciek R, Farwell WR, Choong K, Lakshman K, Mazer NA, Coviello AD, Knapp PE, Ulloor J, Zhang A, Brooks B, Nguyen AH, Eder R, LeBrasseur N, Elmi A, Appleman E, Hede-Brierley L, Bhasin G, Bhatia A, Lazzari A, Davis S, Ni P, Collins L, Bhasin S. Clinical meaningfulness of the changes in muscle performance and physical function associated with testosterone administration in older men with mobility limitation. *J Gerontol A Biol Sci Med Sci.* 2011 Oct;66(10):1090-9. Doi 10.1093/gerona/qlr100. Epub 2011 Jun 22. PubMed PMID: 21697501; PubMed Central PMCID: PMC3202898.
- b. Basaria S, Coviello AD, **Travison TG**, Storer TW, Farwell WR, Jette AM, Eder R, Tennstedt S, Ulloor J, Zhang A, Choong K, Lakshman KM, Mazer NA, Miciek R, Krasnoff J, Elmi A, Knapp PE, Brooks B, Appleman E, Aggarwal S, Bhasin G, Hede-Brierley L, Bhatia A, Collins L, LeBrasseur N, Fiore LD, Bhasin S. Adverse events associated with testosterone administration. *N Engl J Med.* 2010 Jul 8;363(2):109-22. doi: 10.1056/NEJMoa1000485. Epub 2010 Jun 30. PubMed PMID: 20592293; PubMed Central PMCID: PMC3440621.
- c. Bhasin S, **Travison TG**, Storer TW, Lakshman K, Kaushik M, Mazer NA, Ngyuen AH, Davda MN, Jara H, Aakil A, Anderson S, Knapp PE, Hanka S, Mohammed N, Daou P, Miciek R, Ulloor J, Zhang A, Brooks B, Orwoll K, Hede-Brierley L, Eder R, Elmi A, Bhasin G, Collins L, Singh R, Basaria S. Effect of testosterone supplementation with and without a dual 5 α -reductase inhibitor on fat-free mass in men with suppressed testosterone production: a randomized controlled trial. *JAMA.* 2012 Mar 7;307(9):931-9. doi: 10.1001/jama.2012.227. PubMed PMID: 22396515.
- d. Basaria S, **Travison TG**, Alford D, Knapp PE, Teeter K, Cahalan C, Eder R, Lakshman K, Bachman E, Mensing G, Martel MO, Le D, Stroh H, Bhasin S, Wasan AD, Edwards RR. Effects of testosterone replacement in men with opioid-induced androgen deficiency: a randomized controlled trial. *Pain.* 2015 Feb;156(2):280-8. doi: 10.1097/01.j.pain.0000460308.86819.aa. PubMed PMID: 25599449.

Complete List of Published Work in MyBibliography:

<http://www.ncbi.nlm.nih.gov/sites/myncbi/thomas.travison.1/bibliography/48043636/public/?sort=date&direction=ascending>

D. Research Support

Ongoing

P01 AG031720 (Inouye) 04/01/14 – 03/31/16
NIH/National Institute on Aging
Interdisciplinary Study of Delirium and its Long Term Outcomes
This Program Project seeks to elucidate novel risk factors and to examine the contribution of delirium to long term cognitive and functional decline.

2R01AG025037-09A1 (Lipsitz, Lewis A.) 02/01/15-01/31/20
National Institute on Aging
Health Outcomes of Tai Chi in Subsidized Senior Housing
The proposed study aims are to determine the effects of Tai Chi exercises conducted at least twice weekly over a 1 year period on 1) functional performance measured by the Short Physical Performance Battery and 2) health care utilization and costs determined from Medicare claims data in poor, multiethnic, elderly residents of low income housing facilities.

R01AG044518 (Inouye, Sharon K.) 06/15/14-02/28/19
NIH/National Institutes of Health
Development and Validation of a Delirium Severity Toolkit
The goal of this study is to develop a Delirium Severity Toolkit, a dynamic set of six new measures developed with expert clinical judgment and patient/family/nurse input using modern psychometric theory.

R01 AG041658 (Samelson) 09/30/11 – 08/31/16
NIH/NIA
Mechanisms and Clinical Importance of Hyperkyphosis: The Framingham Study
Hyperkyphosis (forward thoracic curvature) in older adults is an important, common problem, associated with significant disability, morbidity, and mortality, and will increase with the aging of the population. The purpose of this project is to determine the natural history, risk factors and clinical outcomes of hyperkyphosis. A greater understanding of the factors that contribute to progression of kyphosis will help lead to interventions to prevent and treat this complex condition.

01/01/15 – 12/31/15

The Dr. Ralph & Marian Falk Medical Research Trust
Treatment of Cerebral Microvascular Disease with Noninvasive Brain Stimulation
This is a 1-year pilot study to establish the feasibility of deployment of tDCS in large populations of individuals with CMD, and to obtain preliminary evidence for a causal effect of the intervention on mobility, executive function and depressive symptoms in this population.

Policy Analysis, Inc. (Hannan) 10/01/14-12/31/16
Short-Term Risk-Prediction Models for Osteoporotic Fracture in Postmenopausal Women, Based on Data from Framingham Heart Study
This project will involve the development of statistical models to predict short-term risk of hip fracture and non-vertebral fracture respectively, in women of advanced age with osteoporosis, and with osteoporosis, osteopenia, and or a history of fracture, alternatively.

Previous and completed

P30AG031679 Bhasin (PI) 9/2008-5/2013
Boston OAIC: A Translational Approach to Function Promoting Anabolic Therapies.
Role: Core Leader, Biostatistical Design and Analysis Core