Title

Slow Gait Speed and Risk of Long-Term Nursing Home Residence in Older Women, Adjusting for Competing Risk of Mortality: Results from the Study of Osteoporotic Fractures

Journal

Journal of the American Geriatrics Society, 64(12)

ISSN

0002-8614

Authors

Lyons, Jennifer G
Ensrud, Kristine E
Schousboe, John T
et al.

Publication Date

2016-12-01

DOI

10.1111/jgs.14346

Peer reviewed

HHS Public Access

Author manuscript

J Am Geriatr Soc. Author manuscript; available in PMC 2017 December 01.

Published in final edited form as:

J Am Geriatr Soc. 2016 December ; 64(12): 2522–2527. doi:10.1111/jgs.14346.

Slow Gait Speed and Risk of Long-Term Nursing Home Residence in Older Women, Adjusting for Competing Risk of Mortality: Results from the Study of Osteoporotic Fractures

Jennifer G. Lyons, M.P.H.[1], **Kristine E. Ensrud, M.D., M.PH.**[2,3,4], **John T. Schousboe, M.D., Ph.D.**[5,6], **Charles E. McCulloch, Ph.D.**[7], **Brent C. Taylor, Ph.D.**[2,3,4], **Timothy C. Heeren, Ph.D.**[8], **Sherri O. Stuver, Sc.D.**[1], and **Lisa Fredman, Ph.D**[1]

[1]Epidemiology Department, Boston University School of Public Health (BUSPH), Boston, MA

[2]Department of Medicine, University of Minnesota, Minneapolis, MN

[3]Division of Epidemiology & Community Health, University of Minnesota, Minneapolis, MN

[4]Center for Chronic Disease Outcomes Research, VA Health Care System, Minneapolis, MN

[5]Park Nicollet Institute for Research and Education, Health Partners, Minneapolis, MN

[6]Division of Health Policy and Management, University of Minnesota

[7]Department of Epidemiology and Biostatistics, University of California, San Francisco, School of Medicine

[8]Biostatistics Department, BUSPH, Boston, MA

Abstract

Background—Slow gait speed is an objective measure of physical function that predicts morbidity and mortality in older adults, but whether it increases the risk of costly long-term nursing home residence when accounting for death as a competing risk remains unknown.

Design—Longitudinal cohort study using proportional hazards models to predict long-term nursing home residence, compared to subdistribution models with death as a competing risk.

Setting—Community-based prospective cohort study

Corresponding author: Lisa Fredman, Ph.D., Department of Epidemiology, Boston University School of Public Health, 715 Albany Street, Boston, MA 02118. Telephone: (617) 638-7719; FAX: (617) 638-4458; lfredman@bu.edu.

Author Contributions: All authors contributed to this work. Individual authors have made the following contributions: Lisa Fredman oversaw the implementation and quality assurance of the study, contributed to the interpretation of these results, and critically reviewed this manuscript. Jennifer Lyons conceived of the study, conducted the analyses, and drafted the manuscript. Kristine Ensrud conceived of and designed the study, acquired the subjects and data, contributed to the interpretation of the results and critically reviewed this manuscript. John Shousboe designed the study, contributed to the interpretation of these results, and critically reviewed this manuscript. Charles McCulloch, Brent Taylor, Timothy Heeren and Sherri Stuver contributed to the interpretation of these results and critically reviewed this manuscript.

Conflict of Interest: Several authors received NIH funding for their work on the Study of Osteoporotic Fractures.

Sponsor's Role: The funding agencies had no direct role in the conduct of the study; the collection, management, analyses and interpretation of the data; or preparation or approval of the manuscript.

Participants—3,755 older women (mean age = 76.3) participating in the Study of Osteoporotic Fractures who were also enrolled in Medicare fee-for-service plans were followed until long-term nursing home residence, disenrollment from Medicare plan, death, or December 31, 2010.

Measurements—Gait speed was measured on a straight six-meter course and averaged over two trials. Long-term nursing home residence was defined by a validated algorithm based on Medicare Part B claims for nursing home-related care.

Results—Over the follow-up period (median: 11 years), 881 participants (23%) experienced long-term nursing home residence and 1,013 (27%) died before experiencing this outcome. Slow walkers (55% of participants with gait speed <1 meter/second) were significantly more likely than faster walkers to reside in a nursing home long-term (adjusted Hazards Ratio, aHR = 1.79, 95% confidence interval, CI: 1.54, 2.09). Associations were attenuated in subdistribution models (aHR=1.52, 95% CI: 1.30, 1.77) but remained statistically significant.

Conclusion—Older community-dwelling women with slow gait speed are more likely to experience long-term nursing home residence as well as mortality without long-term residence. Ignoring the competing mortality risk may overestimate long-term care needs and costs.

Keywords

aging; gait speed; Medicare; nursing home; competing risk

INTRODUCTION

Slow gait speed is an objective measure of poor physical function that is associated with increased risk of disability, morbidity, and mortality in older adults [1–3]. Poor physical function is a predictor of nursing home residence even when accounting for characteristics that increase the risk of nursing home admission, such as health [1] and cognitive status [4]. Quantitative estimates of the association between gait speed and nursing home placement may overestimate risk because gait speed strongly predicts death, making mortality a competing risk [5]. While poorer physical function predicts institutionalization [1,4,6] and mortality is a known competing risk for nursing home placement of 100 days or more [7], it is unknown whether slow gait speed increases the risk of longer-term nursing home residence or whether this association is influenced by the competing risk of mortality.

Accurately assessing risk of long-term nursing home residence is a necessary step to decrease the national and individual burden of health care costs. National expenditures for nursing home residence of one year or more range from $25 to $29 billion.[8] Thirty percent of nursing home residents stay for 13 months or more and 25% remain in a nursing home for over three years.[9] Preventing or delaying long-term nursing home residence would significantly reduce the financial burden on both individuals and federal programs and is an important issue for health policy and management.

Traditional survival models may underestimate the association between slow gait speed and long-term nursing home residence due to differences in mortality rates between slow and faster walkers: slow walkers are at greater risk of nursing home residence and are also more likely to die before they can experience this outcome [10,11]. In this situation, mortality should

not be treated as an uninformative censoring event because subjects censored due to death may not have the same distribution of time-to-event as subjects who experience long-term nursing home residence [12]. A recent study of community-dwelling older adults found that accounting for mortality as a competing risk reduced the association between a summary score of self-reported limitations in activities of daily living and nursing home placement [7]. To our knowledge, no study has evaluated an objective measure of physical performance, such as gait speed, as a predictor of long-term nursing home residence while controlling for mortality as a competing risk.

To examine this association, we used a unique longitudinal data set comprised of women participating in the Study of Osteoporotic Fractures (SOF) and enrolled in a Medicare fee-for-service plan. We hypothesized that older women with slow usual gait speed would have a higher risk of long-term nursing home residence compared to older women with faster gait speed. In addition, we hypothesized that this association would attenuate once mortality was included as an informative censoring event.

METHODS

Sample

The SOF sample included 9,704 women aged 65 or older who were recruited between 1986 and 1988 from population-based listings in four areas of the United States: Baltimore County, MD; Minneapolis, MN; Portland, OR; and the Monongahela Valley, PA [13]. Women were excluded if they could not walk without assistance or had a history of bilateral hip replacement. During 1996–97, an additional 662 African-American women who met the same inclusion criteria were enrolled, making an overall total of 10,066. All participants provided written informed consent and the Institutional Review Boards of each study site approved the study protocol.

Data collection and analytic sample

Linkage of the SOF cohort to Medicare Claims Files was completed by submitting participant social security and/or Medicare numbers to the Centers for Medicare and Medicaid Services [14]. Claims files were first available as of 1/1/1991. Of the 9,986 SOF enrollees who were alive as of this date, 6,435 were enrolled in a Medicare fee-for-service plan for at least one month between 1/1/1991 and 12/31/2010 and 5,804 did not have alternative insurance plans. Of these women, 3,755 had a gait speed measurement taken at the SOF interview immediately following Medicare claims data availability, Visit 4 for Caucasians and Visit 6 for African Americans (Figure 1). The 3,755 SOF participants in the analytic sample were slightly younger, more likely to be African American, and more likely to be married than those who were excluded from this analysis.

Gait speed

Usual gait speed (meters/second, m/s) was ascertained by trained interviewers over a straight six-meter course and averaged over two timed trials [15]. Usual gait speed was dichotomized as slow (< 1.0 m/s) and faster (≥1.0 m/s); this cut point was strongly predictive of mortality in a recent pooled analysis of nine community-based cohort studies [2] and was the median

baseline gait speed in the SOF sample. Alternative gait speed cut-points are also predictive of negative health outcomes in older adults [2,16], therefore, we conducted sensitivity analyses dichotomizing usual gait speed at 0.8 m/s.

Long-term nursing home residence

Incident long-term nursing home residence was defined by a modified version of a previously published algorithm using Medicare claims data to distinguish between short-term (usually intended for purposes of post-hospital rehabilitation, Medicare Part A) and long-term (usually for custodial residence, Medicare Part B) nursing home stays [17,18]. Since Medicare does not cover long-term nursing home stays, the algorithm uses billing information for outpatient services that are delivered to nursing home residents. We first identified a month with a carrier or outpatient bill that did not occur during Part A-covered nursing home stays and examined up to the following 12 months for subsequent Part B outpatient services delivered in the nursing home. For participants with less than thirteen months of Medicare claims, all available months were considered in the algorithm. We defined long-term nursing home residents as women who had a Part B nursing home claim submitted for 40% or more of their eligible follow-up months as long as no Part A nursing home claims were submitted during this period. For example, if a participant was followed in a nursing home for only 5 months and submitted Plan B claims for 2 of those months, she was considered to have met the criteria for long-term nursing home placement. This definition has high predictive validity (sensitivity 87%, specificity 96%) of custodial residence in a nursing home [17].

Death

All-cause mortality was defined as date of death by Medicare records as of 12/31/2010.

Covariates

Sociodemographic variables included the respondent's age and marital status (married versus other), self-reported race (Caucasian versus African American), highest level of education (> 12 years versus ≤12 years), and SOF study site.

Health status variables included body mass index (BMI, weight in kilograms/height in meters^2) and cognitive function based on the modified Mini Mental State Exam (MMSE, possible scores 0–30) [19].

Statistical Analyses

Separate unadjusted and adjusted associations between gait speed and long-term nursing home residence were first examined using Cox proportional hazards regression (hazards ratios (HR) and 95% confidence intervals (CI)) (SAS 9.4, SAS Institute, Inc., Cary, NC) with death as an uninformative censoring event. Covariates were retained in the model if they were determined to be clinically or statistically relevant. Manual backwards selection was used to sequentially eliminate individual covariables if they were not statistically significant ($p>0.20$) and their elimination did not change the coefficient for slow gait speed by 10% or more The final adjusted models included age, race, marital status, BMI, MMSE and SOF interview site.

We then fit unadjusted and adjusted subdistribution hazards models [20] which treated death before long-term nursing home residence as a competing risk. In these subdistribution models, participants who died prior to meeting the criteria for long-term nursing home placement were censored as a death but continued to contribute person-time until the end of study follow-up (i.e., 12/31/2010). This approach allowed us to estimate the hazards ratio of long-term nursing home placement as if the competing risk of death had never occurred. Since this method increases person-time without increasing the number of observed outcomes, subdistribution hazards ratios tend to be smaller than traditional Cox proportional hazards ratios. We included the same covariates in the subdistribution models as in the traditional Cox models.

In sensitivity analyses we changed the cut-point of slow gait speed from 1.0 m/s to 0.8 m/s and fit traditional Cox and subdistribution models as described above.

RESULTS

Sample characteristics

At baseline, the mean age of participants was 76.3 (SD=4.7) years and 9.7% were African American. Mean gait speed was 0.96 (SD=0.23) m/s and 54.7% of participants were slow walkers (i.e., mean gait speed < 1.0 m/s). Slow walkers were more likely to be African-American, older, and have more cognitive impairment than fast walkers. Over the follow-up period, 881 participants (23%) became long-term nursing home residents.

The informative censoring groups for long-term nursing home residence included 1,013 participants who died prior to this outcome and 1,861 who were censored due to disenrollment from Medicare, request to terminate from SOF, or the end of follow-up. Participants who experienced long-term residence had significantly slower gait speed compared to those who were censored, but not compared to those who died. Those who experienced long-term residence were also older, had a lower BMI and were less likely to be married than those who died and those who were censored (Table 1).

Gait speed and incident long-term nursing home residence

Slow walkers were more likely to become long-term nursing home residents than faster walkers (29% versus 17%) and also more likely to die prior to the outcome (31% versus 22%). In both unadjusted and adjusted Cox-proportional hazards models, slow walkers were more likely than faster walkers to become long-term residents (HR= 2.35, 95% CI: 2.04, 2.71, and aHR= 1.79, 95% CI: 1.54, 2.09) (Table 2).

In adjusted subdistribution models, risk of long-term nursing home residence among slow walkers was attenuated but remained statistically significant (HR= 1.52, 95% CI: 1.30, 1.77) (Table 2).

Sensitivity analyses

When using a stricter cut point of 0.8 m/s for slow gait speed, unadjusted and adjusted Cox proportional hazards models resulted in a slightly stronger association between gait speed and long-term nursing home residence (HR= 2.75, 95% CI: 2.38, 3017; aHR= 1.97, 95% CI:

1.68, 2.31). The adjusted subdistribution models showed little difference between the two gait speed cut-points (aHR= 1.53, 95% CI: 1.30, 1.81).

DISCUSSION

In this study of community-dwelling older women followed for up to 18 years we observed an increased risk of long-term nursing home residence among slow walkers compared to faster walkers. This relationship remained statistically significant but was slightly attenuated when accounting for mortality as a competing risk. That is, accounting for death as an informative censoring event resulted in a smaller estimated effect of gait speed on the risk of long-term nursing home placement. Differences between the traditional proportional hazards and the subdistribution models confirm previous research that suggests that death should be considered an informative censoring event in time-to-event analyses performed on older populations [5,7].

Our results are consistent with previous studies of the associations between physical function, measured by self-reported limitations in activities of daily living [7], a performance summary score [1], and gait speed, [4,6] and nursing home admission. These studies were either conducted over shorter follow-up periods [1,6] or on smaller samples [4], and none distinguished long-term custodial care from rehabilitation stays. Only one evaluated mortality as a competing risk [7], but used self-reported measures of both physical function and nursing home stays. We believe that ours is the first study to evaluate the association between gait speed, an objective measure of physical function, and long-term nursing home placement while controlling for death as a competing risk.

Gait speed is in essence a summary measure that incorporates a variety of health and physical function components, including motor control [21], muscle strength [22,23] and musculoskeletal condition [24]. Gait speed predicts traits not related to physical capabilities, such as cognitive function [25,26]. As such, it is a measure of general health that distinguishes between biologically and chronologically old individuals [27] and is a component of clinical frailty [28]. These relationships suggest that gait speed is a marker on the pathway to functional and cognitive dependence that increase the risk of institutionalization.

There are several limitations to the current study. The SOF sample included only women. In addition, we did not capture claims data for patients enrolled in Medicare Part C (HMO) plans, so results may not be generalizable to older adults with these health plans. However, it is unlikely that the biological mechanisms that underlie the association between gait speed and nursing home residence vary by gender or insurance group.

Nevertheless, this study had several strengths. Our sample was large with a long follow-up period allowing us to capture a large number of events. Since all data except for the study outcomes were from a longitudinal epidemiologic study, we were able to control for important covariables such as BMI and MMSE, which would not be possible if we relied only on administrative data. Gait speed itself is valid and reliable; it is an objective measure of function, can be performed at the clinic or in the home, and is easily administered [29,30].

This study applied a relatively new technique to appropriately account for death in a longitudinal study of nursing home residence and found that although the association was attenuated, slow walking speed remained a significant risk factor for long-term nursing home residence. Due to the financial costs to individuals and national programs, delaying or eliminating long-term nursing home stays should be a priority for clinicians and policy makers. Failure to use competing risk analyses, however, may overstate the financial burden of gait speed on long-term nursing home residence since gait speed is also associated with death before nursing home placement. These results highlight the value of using gait speed as a diagnostic tool to identify older adults who may be at risk of long-term nursing home residence and for whom interventions to improve physical function may help to delay nursing home placement and/or prolong community-based care care.

Acknowledgments

Funding: This work was supported by the National Institutes of Health (grant numbers R01 AG005407, R01 AR35582, R01 AR35583, R01 AR35584, R01 AG005394, R01 AG027574, R01 AG027576, R01 AG18037 and R01 AG028144).

Kristine E. Ensrud, John T. Schousboe, Charles E. McCulloch, Brent C. Taylor, Lisa Fredman have received grant support from the NIH (and supporting agencies) for the Study of Osteoporotic Fractures as listed under Funding Sources on the title page.

References

1. Guralnik JM, Simonsick EM, Ferrucci L, et al. A short physical performance battery assessing lower extremity function: Association with self-reported disability and prediction of mortality and nursing home admission. J Gerontol. 1994; 49:M85–94. [PubMed: 8126356]
2. Studenski S, Perera S, Patel K, et al. Gait speed and survival in older adults. JAMA. 2011; 305:50–58. [PubMed: 21205966]
3. Blain H, Carriere I, Sourial N, et al. Balance and walking speed predict subsequent 8-year mortality independently of current and intermediate events in well-functioning women aged 75 years and older. J Nutr Health Aging. 2010; 14:595–600. [PubMed: 20818476]
4. von Bonsdorff M, Rantanen T, Laukkanen P, et al. Mobility limitations and cognitive deficits as predictors of institutionalization among community-dwelling older people. Gerontology. 2006; 52:359–365. [PubMed: 16905887]
5. Berry SD, Ngo L, Samelson EJ, et al. Competing risk of death: An important consideration in studies of older adults. J Am Geriatr Soc. 2010; 58:783–787. [PubMed: 20345862]
6. Giuliani CA, Gruber-Baldini AL, Park NS, et al. Physical performance characteristics of assisted living residents and risk for adverse health outcomes. Gerontologist. 2008; 48:203–212. [PubMed: 18483432]
7. Castora-Binkley M, Meng H, Hyer K. Predictors of long-term nursing home placement under competing risk: Evidence from the Health and Retirement Study. J Am Geriatr Soc. 2014; 62:913–918. [PubMed: 24779403]
8. Kaye HS, Harrington C, LaPlante MP. Long-term care: Who gets it, who provides it, who pays, and how much? Health Aff. 2010; 29:11–21.
9. Jones AL, Dwyer LL, Bercovitz AR, et al. The National Nursing Home Survey: 2004 overview. National Center for Health Statistics. Vital Health Stat. 2009; 13:1–155.
10. Andersen PK, Geskus RB, de Witte T, et al. Competing risks in epidemiology: Possibilities and pitfalls. Int J Epidemiol. 2012; 41:861–870. [PubMed: 22253319]
11. Varadhan R, Weiss CO, Segal JB, et al. Evaluating health outcomes in the presence of competing risks: A review of statistical methods and clinical applications. Med Care. 2010; 48(6 Suppl):S96–105. [PubMed: 20473207]

12. Dignam JJ, Zhang Q, Kocherginsky M. The use and interpretation of competing risks regression models. Clin Cancer Res. 2012; 18:2301–2308. [PubMed: 22282466]
13. Cummings SR, Black DM, Nevitt MC, et al. Appendicular bone density and age predict hip fracture in women. The Study of Osteoporotic Fractures Research Group. JAMA. 1990; 263:665–668. [PubMed: 2404146]
14. Schousboe JT, Paudel ML, Taylor BC, et al. Magnitude and consequences of misclassification of incident hip fractures in large cohort studies: The Study of Osteoporotic Fractures and Medicare claims data. Osteoporos Int. 2013; 24:801–810. [PubMed: 23208073]
15. Ensrud KE, Nevitt MC, Yunis C, et al. Correlates of impaired function in older women. J Am Geriatr Soc. 1994; 42:481–489. [PubMed: 8176141]
16. Abellan van Kan G, Rolland Y, Andrieu S, et al. Gait speed at usual pace as a predictor of adverse outcomes in community-dwelling older people an International Academy on Nutrition and Aging (IANA) Task Force. J Nutr Health Aging. 2009; 13:881–889. [PubMed: 19924348]
17. Yun H, Kilgore ML, Curtis JR, et al. Identifying types of nursing facility stays using medicare claims data: An algorithm and validation. Health Services and Outcomes Res Methodol. 2010; 10:100–110.
18. Wei YJ, Simoni-Wastila L, Zuckerman IH, et al. Algorithm for Identifying Nursing Home Days Using Medicare Claims and Minimum Data Set Assessment Data. Med Care. 2014 Mar 13. [Epub ahead of print].
19. Folstein MF, Folstein SE, McHugh PR. “Mini-mental state” A practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res. 1975; 12:189–198. [PubMed: 1202204]
20. Fine JP, Gray RJ. A proportional hazards model for the subdistribution of a competing risk. J Am Stat Assoc. 1999; 94:496–509.
21. Gerin-Lajoie M, Richards CL, McFadyen BJ. The circumvention of obstacles during walking in different environmental contexts: A comparison between older and younger adults. Gait Posture. 2006; 24:364–369. [PubMed: 16337384]
22. Buchner DM, Larson EB, Wagner EH, et al. Evidence for a non-linear relationship between leg strength and gait speed. Age Ageing. 1996; 25:386–391. [PubMed: 8921145]
23. Ostchega Y, Dillon CF, Lindle R, et al. Isokinetic leg muscle strength in older americans and its relationship to a standardized walk test: Data from the national health and nutrition examination survey 1999–2000. J Am Geriatr Soc. 2004; 52:977–982. [PubMed: 15161465]
24. Buchman AS, Shah RC, Leurgans SE, et al. Musculoskeletal pain and incident disability in community-dwelling older adults. Arthritis Care Res. 2010; 62:1287–1293.
25. Persad CC, Jones JL, Ashton-Miller JA, et al. Executive function and gait in older adults with cognitive impairment. J Gerontol A Biol Sci Med Sci. 2008; 63:1350–1355. [PubMed: 19126848]
26. Watson NL, Rosano C, Boudreau RM, et al. Executive function, memory, and gait speed decline in well-functioning older adults. J Gerontol A Biol Sci Med Sci. 2010; 65:1093–1100. [PubMed: 20581339]
27. Cesari M. Role of gait speed in the assessment of older patients. JAMA. 2011; 305:93–94. [PubMed: 21205972]
28. Fried LP, Tangen CM, Walston J, et al. Frailty in older adults: Evidence for a phenotype. J Gerontol A Biol Sci Med Sci. 2001; 56:M146–156. [PubMed: 11253156]
29. Studenski S, Perera S, Wallace D, et al. Physical performance measures in the clinical setting. J Am Geriatr Soc. 2003; 51:314–322. [PubMed: 12588574]
30. Montero-Odasso M, Schapira M, Soriano ER, et al. Gait velocity as a single predictor of adverse events in healthy seniors aged 75 years and older. J Gerontol A Biol Sci Med Sci. 2005; 60:1304–1309. [PubMed: 16282564]

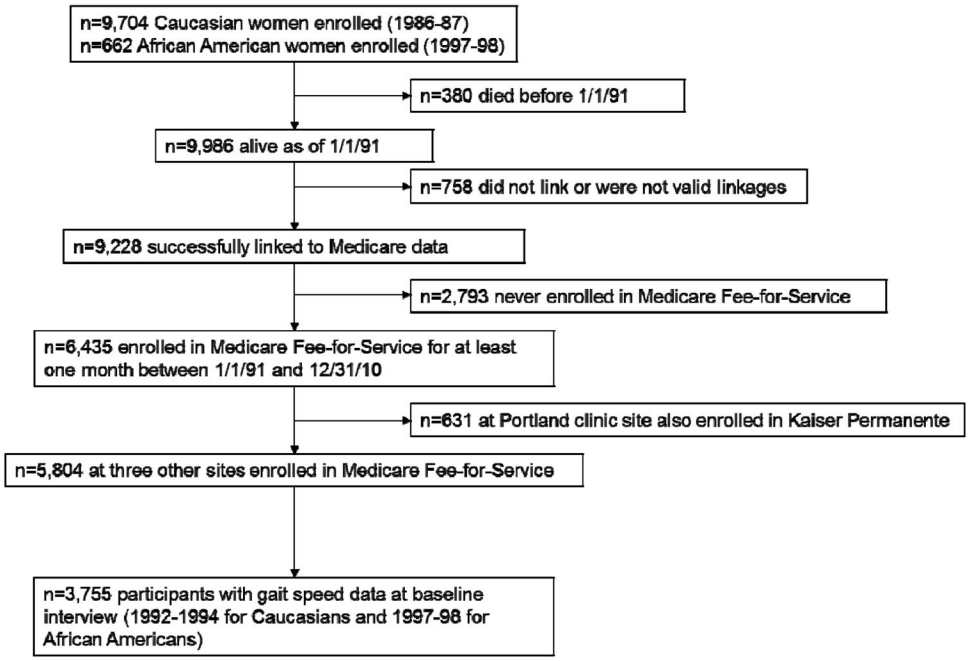

Figure 1.
Flow Diagram of SOF-Medicare Linked Study Sample

Table 1

Baseline Demographic and Health Information for N=3,755 SOF Participants with Medicare Data and Gait Speed By Censoring Event [a]

Characteristic	End of study or disenrollment from Medicare (n=1,861)	Death (n=1,013)	Long-term nursing home residence (n=881)
Gait speed, mean (SD)[b]	1.01 (0.21)	0.92 (0.24)	0.89 (0.24)
Slow walkers, No. (%)[b]	834 (44.8)	631 (62.3)	587 (66.6)
Age, mean (SD), y[bc]	74.78 (3.81)	77.48 (4.84)	78.49 (5.26)
African American, No. (%)[b]	266 (14.3)	63 (6.2)	34 (3.9)
> High school education, No. (%)[c]	756 (40.6)	372 (36.7)	355 (40.3)
Married, No. (%)[bc]	822 (44.5)	329 (33.0)	250 (29.0)
BMI, mean (SD)[b]	27.19 (4.70)	26.63 (5.10)	26.42 (4.56)
Mini Mental Status Exam score, mean (SD)[bc]	24.41 (1.82)	24.08 (2.11)	23.73 (2.44)

[a] p-values for every covariate (except age) are adjusted for baseline age

[b] p-value significant at ≤0.05 comparing long-term residence group to no death or residence group

[c] p-value significant at ≤0.05 comparing long-term residence group to death group

J Am Geriatr Soc. Author manuscript; available in PMC 2017 December 01.

Table 2

Hazards Ratios (HR) and 95% Confidence Intervals (CI) from Traditional Cox Proportional Hazards Models and Subdistribution Models of the Association between Gait Speed and Long-Term Nursing Home Residence

Gait speed and covariates	Traditional Cox Proportional Hazards Models		Subdistribution Models [a]	
	Unadjusted HR (95% CI)	Adjusted HR (95% CI)	Unadjusted HR (95% CI)	Adjusted HR (95% CI)
Slow walkers	2.35 (2.04, 2.71)	1.79 (1.54, 2.09)	1.95 (1.70, 2.24)	1.52 (1.30, 1.77)
Faster walkers	ref	ref	ref	ref
African American		0.29 (0.20, 0.43)		0.32 (0.22, 0.49)
Married		0.76 (0.66, 0.89)		0.79 (0.68, 0.92)
Baseline age		1.27 (1.11, 1.14)		1.09 (1.07, 1.10)
BMI		0.98 (0.97, 1.00)		0.99 (0.98, 1.01)
Mini Mental Status Exam score		0.89 (0.86, 0.91)		0.92 (0.89, 0.95)

[a] Adjusted for SOF study site.