APPENDIX: PROCEDURES FOR SELECTING APPROPRIATE METRICS FOR GAIT-SPEED VARIABLES AND SENSITIVITY ANALYSES OF RESULTS

Procedure for Selecting an Appropriate Metric for Baseline Walking Speed

Baseline values of walking speed in this sample ranged from 0.17 m/s to 1.3 m/s. Although it is possible, two patients at baseline do not typically differ by 1.0 m/s in walking speed. For any two randomly selected patients, between-person differences are much smaller—usually in the range of 0.10 m/s. Beta parameters from regression models using baseline gait speed as a predictor were converted to a more reasonable metric, i.e., change in the outcome per 0.10 m/s difference in walking speed. If desirable, m/s can be converted to m/min simply by multiplying parameter estimates by 60. A difference of 0.10 m/s between two individuals in their walking speed thus amounts to a difference of 6 m/min (0.10 × 60).

Procedure for Selecting an Appropriate Metric for Absolute Change in Walking Speed

Gait-speed changes in this sample ranged from –0.03 m/s/mo to +0.06 m/s/mo. These monthly rates of change can be multiplied by 12 to reflect the absolute amount of change that occurred for each individual in the study. Thus, absolute change in gait speed over 12 months ranged from a loss of 0.36 m/s (–0.03 × 12) to a gain of 0.72 m/s (0.06 × 12). The average rate of change in gait speed was 0.01 m/s/mo; this average rate was multiplied by 12 to get the absolute average change in gait speed in the sample (0.12 m/s). To avoid confusion, parameter estimates are presented in units of 0.10 m/s of absolute gait-speed change over the 12-month period.

Procedure for Determining Parameter Estimates for the Effect of Gait Speed

The magnitude of the parameter estimate for the effect of gait speed is not determined arbitrarily, but is estimated by the statistical model. On the other hand, depending on the coding of the independent variable, the parameter estimate can be presented in a number of different, yet numerically equivalent, ways all of which reflect the same underlying association determined by the model. In other words, if the statistical association estimated by the model suggests that a difference of 0.10 m/s is associated with 0.63 disabilities then this also inherently means that a difference in gait speed of 1.0 m/s is associated with a difference of 6.3 disabilities, and similarly that a difference of 2.0 m/s is associated with a difference of 12.6 disabilities. All three presentations reflect the same degree of association that was originally estimated using the model. The choice of the unit used for presenting the results is typically based on subject matter content and a desire to present a reasonable, or clinically meaningful, unit of change. As can be seen in the example above, selecting the smaller metric yields a smaller corresponding change in the outcome, but we believe it is the more clinically reasonable metric. A difference of 2.0 m/s is not a reasonable unit of difference because older adult gait speeds typically do not exceed ~ 1.8 m/s unless an individual is running. The unit of 1.0 m/s is a very large

difference that has poor clinical utility because changes of this magnitude are extremely rare. None of the differences in gait speed we observed approached 1.0 m/s, even over a full year time period. We believe that the use of 1.0 m/s as the standard metric exaggerates the perception of the corresponding change in the outcome given that a difference or change of this magnitude in gait speed (as well as the corresponding change in the dependent variable) is unlikely. For this reason, we prefer the more clinically-relevant unit of change (0.10 m/s) for presentation.

Sensitivity Analysis: Change in health status characteristics and baseline gait speed. Beta coefficient and 95 percent confidence intervals representing average difference in baseline health and disability status, inpatient rehabilitation visits, medical-surgical visits, and inpatient costs per 0.10 m/s difference in gait speed at baseline (baseline regression analysis controlling for age, gender, race, education, number of medications, treatment assignment, and Charlson Comorbidity Index (*n* = 1,388).

Health Status Characteristic	Unit Difference* in Indicator per 0.10 m/s Δ in Baseline Gait Speed (95% CI)
SF-36 Total Score	
Raw Units	8.3 (5.4 to 11.2)
Standardized Units	3.4 (2.2 to 4.6)
SF-36 Physical Function Subscale	
Raw Units	3.8 (3.3 to 4.3)
Standardized Units	1.6 (1.4 to 1.8)
No. of Disabilities	–0.47 (–0.54 to –0.39)
No. of Inpatient Rehabilitation Visits	–1.6 (–2.0 to –1.1)
Number of Inpatient Medical-Surgical Visits	–2.3 (–2.9 to –1.6)
Length of Stay (d)	–1.7 (–2.2 to –1.2)
Inpatient Costs	– $1,075 (–$1,416 to –$734)

*Beta coefficient and 95 percent CI per unit Δ in gait speed.

CI = confidence interval, SF-36 = 36-item short form, Δ = change .

Sensitivity Analysis: Prediction of change in clinical indicators with gait-speed baseline and change over 1 yr. Use of gait speed (baseline and absolute change over 1 yr) to predict absolute 12-month change in clinical indicators (SF-36, physical function subscale, and disability), inpatient health services use, and total costs (n = 1,388).*

Outcomes	Baseline Gait Speed †(unit = 0.10 m/s) β(95% CI)*	Change in Gait Speed †(unit = 0.10 m/s/yr) β(95% CI)*
Δ SF-36		
Raw	–6.36 (–9.84 to –2.88)	19.39 (14.09 to 24.69)
Standardized	–2.64 (–4.08 to –1.20)	8.10 (5.90 to 10.30)
Δ Physical Function Subscale		
Raw	–1.80 (–2.52 to –1.08)	6.70 (5.70 to 7.70)
Standardized	–0.72 (–0.96 to –0.48)	2.80 (2.40 to 3.20)
Δ Disability		
Basic	0.24 (0.19 to 0.29)	–0.30 (–0.38 to –0.22)
Instrumental	0.05 (–0.02 to 0.12)	–0.60 (–0.70 to –0.50)
Total	0.24 (0.14 to 0.34)	–1.00 (–1.20 to –0.80)
No. Inpatient Rehabilitation Visits	–2.0 (–2.5 to –1.4)	0.72 (0.12 to 1.31)
No. Inpatient Medical-Surgical Visits	–2.8 (–3.7 to –1.9)	0.75 (0 to 1.50)
Length of Stay (d)	–2.2 (–2.9 to –1.4)	–2.26 (–3.13 to –1.39)
‡Total 1 Yr Costs	–$117 (–$765 to $529)	–$1,194 (–$2,306 to –$82)

*All models are adjusted for age, gender, race, education, no. of baseline medications, baseline comorbidity, and treatment assignment. Beta coefficients and 95 percent CIs represent change in the outcome per unit change in gait speed.

† See above for details of walking speed units.

‡ Fully adjusted models including age, gender, race, education, number of baseline medications, baseline comorbidity, treatment assignment, length of stay, baseline gait speed, change in health status, and changes in BADL and IADL.

BADL = basic activities of daily living, CI = confidence interval, IADL = instrumental activities of daily living, SF-36 = 36-item short form, Δ = change.