AJKD

Original Investigation

Community Mobility Among Older Adults With Reduced Kidney Function: A Study of Life-Space

C. Barrett Bowling, MD, MSPH,[1,2] Paul Muntner, PhD,[3] Patricia Sawyer, PhD,[2] Paul W. Sanders, MD,[4] Nancy Kutner, PhD,[5] Richard Kennedy, MD, PhD,[2] and Richard M. Allman, MD[1,2]

Background: Life-Space Assessment captures community mobility and social participation and quantifies the distance, frequency, and independence obtained as an older adult moves through his or her environment. Reduced estimated glomerular filtration rate (eGFR) is associated with decline in activities of daily living among older adults, but less is known about the association of eGFR with restrictions in mobility.

Study Design: Prospective observational cohort study.

Setting & Participants: Community-dwelling Medicare beneficiaries from the University of Alabama at Birmingham Study of Aging who had serum creatinine measured during a baseline in-home study visit and completed at least one telephone follow-up (N = 390).

Predictor: eGFR ≥ 60, 45-59, and <45 mL/min/1.73 m^2.

Outcome: Life-space mobility trajectory.

Measurements: Life-space mobility was evaluated by telephone every 6 months for up to 4.5 years using the previously validated Life-Space Assessment. Scores using this tool range from 0-120 (higher scores indicate greater mobility).

Results: Mean age of the 390 participants was 77.6 ± 5.8 (SD) years, 41% were African American, 50.5% were women; 30.0% had eGFR of 45-59 mL/min/1.73 m^2, and 20.2% had eGFR < 45 mL/min/1.73 m^2. Age-, race-, and sex-adjusted mean baseline life-space mobility scores were 64.8 (95% CI, 62.0-67.6), 63.8 (95% CI, 60.3-67.4), and 58.3 (95% CI, 53.8-62.7) among those with eGFR categories ≥ 60, 45-59, and <45 mL/min/1.73 m^2, respectively. Compared with those with eGFRs ≥ 60 mL/min/1.73 m^2, a more rapid decline in life-space mobility was found among those with eGFRs < 45 mL/min/1.73 m^2, though this did not reach statistical significance ($P = 0.06$); a similar effect was not seen among those with eGFRs of 45-59 mL/min/1.73 m^2 ($P = 0.3$).

Limitations: Urinary albumin or longitudinal measures of eGFR were not available.

Conclusions: eGFR < 45 mL/min/1.73 m^2 was associated with a trend toward a more rapid decline in life-space mobility among community-dwelling older adults. Findings should be confirmed in a larger population. *Am J Kidney Dis.* ■(■):■-■. *Published by Elsevier Inc. on behalf of the National Kidney Foundation, Inc. This is a US Government Work. There are no restrictions on its use.*

INDEX WORDS: Chronic kidney disease; life-space mobility; elderly.

The prevalence of reduced estimated glomerular filtration rate (eGFR) increases with older age. Even among the oldest-old (ie, those ≥80 years), reduced eGFR is associated with concurrent complications of chronic kidney disease (CKD) and adverse health outcomes, including cardiovascular disease and mortality.[1-3] Furthermore, among older adults, reduced eGFR is associated with problems not traditionally thought to be a consequence of kidney disease, such as declines in both basic and instrumental activities of daily living and the development of persistent inability to walk one-quarter mile or climb 10 steps.[4,5]

Whereas prior studies have identified associations between reduced eGFR and the ability to carry out specific functional tasks and impairments in walking, less is known about the broader impact of kidney function on community mobility and social participation. Maintaining task-specific functional abilities is important for independent living; however, older adults often report health goals in terms of their ability to engage in social activities.[6] Attending family events

From the [1]Birmingham/Atlanta Geriatric Research, Education, and Clinical Center, Department of Veterans Affairs Medical Center; [2]Division of Gerontology, Geriatrics and Palliative Care, Department of Medicine; and [3]Department of Epidemiology, School of Public Health, University of Alabama at Birmingham; [4]Division of Nephrology, Department of Medicine, University of Alabama at Birmingham and Department of Veterans Affairs Medical Center, Birmingham, AL; and [5]Department of Rehabilitation Medicine, Emory University, Atlanta, GA.

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Address correspondence to C. Barrett Bowling, MD, MSPH, at his current affiliation, Department of Veterans Affairs, 1670 Clairmont Road (11B), Decatur, GA 30033. E-mail: cbbowli@emory.edu

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such as graduations or weddings, participating in religious services, and visiting with friends may require movement outside of one's home, neighborhood, or town, as well as assistance from another person or special equipment. Measures of activities of daily living do not adequately capture this movement.

Life-space mobility is a measure of community mobility and social participation that quantifies the distance, frequency, and independence obtained as an older adult moves through his or her environment.[6,7] Among community-dwelling older adults, life-space mobility has been shown to be associated independently with mortality, and declines in life-space have been shown to occur in the setting of acute events such as a hospitalization.[8,9] In contrast to task-specific measures that do not capture mobility across the full continuum of function, life-space mobility measures movement through specific life-space levels ranging from within one's bedroom to beyond one's town and reflects social participation to the degree that mobility is associated with such activities.[9] Because older adults with reduced eGFR have a high burden of functional impairment,[4] we hypothesized that reduced eGFR also may be associated with a decline in life-space mobility. Therefore, the aim of the present study was to evaluate the association of reduced eGFR with longitudinal life-space mobility trajectory over 4.5 years of follow-up among community-dwelling older adults in the University of Alabama at Birmingham (UAB) Study of Aging.

METHODS

Participants

The UAB Study of Aging is a population-based longitudinal study of mobility among community-dwelling older adults recruited between November 1999 and February 2001 from a stratified random sample of Medicare beneficiaries 65 years or older from 5 counties (2 urban and 3 rural) in central Alabama. The details of the study have been reported previously.[6,7,10] To provide a balanced sample in terms of race, sex, and rural-urban residence, the UAB Study of Aging oversampled African Americans, men, and residents of rural areas. Persons in nursing homes and those who were unable to set their own appointments were excluded. In the UAB Study of Aging, 624 participants were alive and provided informed consent for a second in-home visit in 2004, of whom 400 had data on serum creatinine from a one-time blood draw. Blood work was not available prior to the second in-home visit. We further limited our study population to those with at least one follow-up life-space mobility measure, resulting in a final analytic sample of 390 (Fig S1, available as online supplementary material). Overall, those excluded were more likely to be African American, report transportation difficulty, have less than a high school education, or have a history of hypertension or stroke. Those excluded also had lower Mini-Mental State Examination (MMSE), lower baseline life-space mobility, and higher Geriatric Depression Scale (GDS) scores (Table S1).

Data Collection and Measures

During an in-home assessment, trained interviewers obtained information on sociodemographic factors and comorbid conditions. Comorbid conditions including hypertension, coronary artery disease, stroke, and peripheral vascular disease were verified by use of a prescription drug for the condition, confirmation by medical history questionnaire completed by participants' primary care physicians, or by review of a hospital discharge summary. Participants were asked to show the interviewer all medications they currently used. Medication names were recorded and coded into drug classes. Transportation difficulty was defined as answering "a little" or "a lot" to the question "over the past 4 weeks, have you had any difficulty getting transportation to where you want to go?" The MMSE was performed, with possible scores ranging from 0-30 and higher scores representing better mental status.[11] Depressive symptoms were obtained using the 15-item GDS.[12] Weight and height were measured and body mass index was calculated. Obesity was defined as body mass index $\geq$30 kg/m^2. Of relevance to the present study, laboratory studies included serum creatinine, hemoglobin, and glycated hemoglobin (hemoglobin A_{1c}). Diabetes mellitus was defined as use of antiglycemic medication, confirmation by medical physician questionnaire, review of a hospital discharge summary, or as hemoglobin A_{1c} value $\geq$6.5%. Data on all baseline participant characteristics were obtained from the 2004 study visit.

Measures of Kidney Function

Fasting blood samples were obtained by trained phlebotomists and processed by the UAB Hospital Laboratory. Serum creatinine was measured using the Beckman Coulter model LX20 analyzer. eGFR was estimated using the CKD-EPI (CKD Epidemiology Collaboration) creatinine equation and categorized as $\geq$60, 45-59, and $<$45 mL/min/1.73 m^2.[13]

Life-Space Mobility

The UAB Study of Aging Life-Space Assessment is a validated measure that reflects mobility and social participation.[7] The composite measure of life-space mobility incorporates life-space level, frequency with which it is attained, and degree of independence, based on the reported use of assistive equipment or help from another person during the past 4 weeks. Life-space mobility subscores are obtained for each life-space level (1-5) by multiplying the life-space level by frequency and independence. Level subscores then are summed across levels to obtain the composite score (Appendix). Scores can range from 0-120, with higher scores indicating greater mobility, and have been shown to be normally distributed in the UAB Study of Aging population.[9] Life-space mobility scores are reliable when collected in person or by telephone.[6] Life-space scores remain relatively stable over 2 weeks of follow-up (intraclass correlation coefficient = 0.96), but reflect changes, both increases and declines, with longer follow-up or after acute events.[7,8] For example, a life-space decline of 10 or more points has been reported to be on the order of decline that occurs with a nonsurgical hospital admission.[8] To provide clinical context for composite life-space mobility scores, Fig 1 shows the mean $\pm$ standard deviation composite life-space mobility scores by life-space zones (bedroom, home, yard, neighborhood, town, and out of town) among all participants in the UAB Study of Aging. Life-Space Assessment was conducted at the time of the in-home assessment completed in 2004 and by telephone interview every 6 months during the subsequent 4.5 years of follow-up. For participants who died during the study, life-space mobility scores through the last available follow-up were used.

Statistical Analysis

Mean levels or proportions (as appropriate) for demographics, health-related factors, and medical conditions at baseline were calculated overall and by eGFR category ($\geq$60, 45-59, and $<$45 mL/min/1.73 m^2). Our primary dependent variable was life-space mobility. For the main analysis, multilevel change

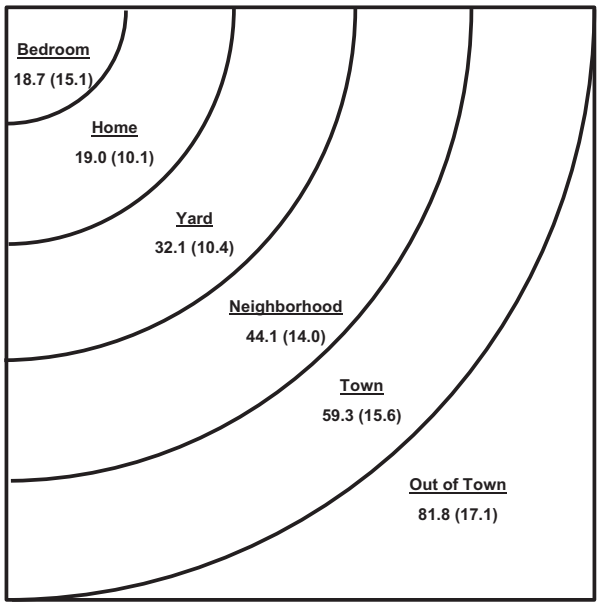

Figure 1. Conceptual model shows life-space levels with mean ± standard deviation for composite life-space score among all University of Alabama at Birmingham Study of Aging participants (n = 1,000) by level achieved without help from another person in the 4 weeks before the baseline assessments completed in 1999-2001.

(random coefficients) regression models were used to determine the association between eGFR and life-space mobility trajectory over time. In our multilevel change model, level 1 consisted of longitudinal (within-person) trajectories of life space as a function of time and level 2 consisted of group intercepts and growth factors, as well as between-person predictors of individual differences in those intercepts and growth factors.[14] This method allows for the evaluation of overall group effects with random individual deviations in life-space mobility slope.

We first evaluated unconditional mean models that included only eGFR category and time evaluating linear, quadratic, and logarithmic life-space trajectories and different error structures. Model fit statistics, including the Akaike information criterion, were calculated and a model using log-transformed years with an unstructured error model using restricted maximum likelihood estimation provided the best fit. In order to evaluate the impact of eGFR independent of potential confounders, our next model included adjustment for age, race, and sex. A subsequent model included additional adjustment for rural residence, marital status, transportation difficulty, smoking status, education, diabetes, hypertension, stroke, peripheral vascular disease, obesity, coronary artery disease, hemoglobin concentration, MMSE score, and GDS score. Using the multivariable-adjusted model, growth curves for change in life-space mobility from baseline were plotted.

In a secondary analysis, Poisson regression models were used to obtain crude and multivariable-adjusted risk ratios for the association between baseline eGFR and decline in life-space mobility. Life-space decline was defined as a decrease of at least 10 points from baseline to the last available follow-up. As before, eGFR was categorized as ≥60, 45-59, and <45 mL/min/1.73 m^2, with ≥60 mL/min/1.73 m^2 serving as the referent category. A multivariable-adjusted Poisson model included adjustment for the characteristics described and follow-up time. As a sensitivity analysis, we modeled a decline in life-space mobility as a 10 or more point decline from baseline to both of the last 2 available follow-up visits. All analyses were conducted using SAS, version 9.3 (SAS Institute Inc).[15]

RESULTS

Baseline Characteristics of Participants

Mean age of the 390 participants was 77.6 ± 5.8 (SD) years, 41% were African American, and 50.5% were women (Table 1). Of 390 participants, 194 (49.7%) had eGFRs ≥ 60 mL/min/1.73 m^2 and 117 (30.0%) and 79 (20.2%) had eGFRs of 45-59 and <45 mL/min/1.73 m^2, respectively. Compared with those with eGFRs ≥ 60 mL/min/1.73 m^2, those in the lower eGFR categories were more likely to be women, live in rural areas, report transportation difficulty, have hypertension or diabetes, and be less likely to be married. Those with eGFRs < 45 mL/min/1.73 m^2 were older and more likely to be African American and have a lower hemoglobin concentration.

Reduced eGFR and Baseline Life-Space Mobility

Mean life-space mobility scores at baseline were 66.9 (95% confidence interval [CI], 63.8-70.0), 63.5 (95% CI, 59.5-67.5), and 52.9 (95% CI, 48.0-57.9) among those with eGFRs ≥ 60, 45-59, and <45 mL/min/1.73 m^2, respectively. After adjustment for age, race, and sex, mean life-space mobility scores at baseline were 64.8 (95% CI, 62.0-67.6), 63.8 (95% CI, 60.3-67.4), and 58.3 (95% CI, 53.8-62.7) among those with eGFRs ≥ 60, 45-59, and <45 mL/min/1.73 m^2, respectively.

Reduced eGFR and Life-Space Trajectory

Mean life-space mobility scores over 4.5 years of follow-up were 8.7 ± 2.0, 9.0 ± 1.8, and 8.3 ± 2.4 among those with eGFRs ≥ 60, 45-59, and <45 mL/min/1.73 m^2, respectively. Changes in life-space mobility scores over follow-up are displayed in Fig 2 and Table S2. After adjustment for age, race, sex, rural residence, marital status, transportation difficulty, diabetes, hypertension, coronary artery disease, stroke, peripheral vascular disease, hemoglobin concentration, MMSE score, GDS score, and baseline life-space mobility score and compared with those with eGFRs ≥ 60 mL/min/1.73 m^2, a more rapid decline in life-space mobility was found among those with eGFRs < 45 mL/min/1.73 m^2 ($P = 0.06$), but not those with eGFRs of 45-59 mL/min/1.73 m^2 ($P = 0.3$; Table 2).

Reduced eGFR and Decline in Life-Space Mobility of 10 or More Points

A decline in life-space mobility score of 10 or more points from baseline to the last available follow-up occurred in 47.9%, 39.3%, and 60.8% of participants with eGFRs ≥ 60, 45-59, and <45 mL/min/1.73 m^2, respectively (Table 3). Compared with

Table 1. Baseline Characteristics of UAB Study of Aging Participants by eGFR Category

Characteristic	All (N = 390)	eGFR ≥ 60 (n = 194)	eGFR = 45-59 (n = 117)	eGFR < 45 (n = 79)	*P* Trend
Age (y)	77.6 ± 5.8	76.5 ± 5.4	77.6 ± 5.7	80.4 ± 6.2	<0.001
Female sex	197 (50.5)	85 (43.8)	65 (55.6)	47 (59.5)	0.001
African American	160 (41.0)	79 (40.7)	44 (37.6)	37 (46.8)	0.5
Rural residence	180 (46.2)	74 (38.1)	61 (52.1)	45 (57.0)	0.002
Married	205 (52.6)	115 (59.3)	61 (52.1)	29 (36.7)	0.001
Transportation difficulty	49 (12.6)	18 (9.3)	17 (14.5)	14 (17.7)	0.04
Current smoker	25 (6.4)	13 (6.7)	8 (6.8)	4 (5.1)	0.7
<HS education	157 (40.3)	71 (36.6)	48 (41.0)	38 (48.1)	0.08
Comorbid conditions					
Diabetes mellitus	140 (35.9)	62 (32.0)	43 (36.8)	35 (44.3)	0.06
Hypertension	293 (75.1)	132 (68.0)	92 (78.6)	69 (87.3)	0.001
Coronary artery disease	81 (20.8)	42 (21.7)	25 (21.4)	14 (17.7)	0.5
PVD	53 (13.6)	31 (16.0)	11 (9.4)	11 (13.9)	0.4
Stroke	42 (10.8)	20 (10.3)	11 (9.4)	11 (13.9)	0.5
Obesity	118 (30.3)	57 (29.4)	35 (29.9)	26 (32.9)	0.6
Health-related factors					
Hemoglobin (g/dL)	13.5 ± 1.7	13.7 ± 1.5	13.7 ± 2.0	12.6 ± 1.5	<0.001
MMSE score	25.8 ± 4.0	26.1 ± 4.1	26.0 ± 3.7	24.6 ± 3.9	0.01
GDS score	2.0 ± 2.0	1.9 ± 2.1	1.8 ± 1.8	2.4 ± 2.0	0.1

Note: Values for categorical variables are given as number (percentage); values for continuous variables are given as mean ± standard deviation. Baseline in-home visit and data collection for all patient characteristics for this analysis was in 2004.

Abbreviations: eGFR, estimated glomerular filtration rate (given in mL/min/1.73 m^2); GDS, Geriatric Depression Scale; HS, high school; MMSE, Mini-Mental State Examination; PVD, peripheral vascular disease; UAB, University of Alabama at Birmingham.

those with eGFRs ≥ 60 mL/min/1.73 m^2, the multivariable adjusted risk ratio for decline in life-space mobility was 1.33 (95% CI, 1.05-1.70) among participants with eGFRs < 45 mL/min/1.73 m^2. eGFRs of 45-59 mL/min/1.73 m^2 were not associated with a decline in life-space mobility. Results were similar when decline in life-space mobility was defined as a 10 or more point reduction from baseline to the last 2 available follow-up assessments (data not shown).

DISCUSSION

In the present study of community-dwelling older adults, eGFR < 45 mL/min/1.73 m^2 was associated with a non–statistically significant trend toward a more rapid decline in life-space trajectory during 4.5 years of follow-up. The mean decline in life-space mobility in this group, which, as shown in Fig 2, was over 12 points, was consistent with a constriction of independent movement by one life-space zone, such as from within one's town to within one's neighborhood, from one's neighborhood to one's yard, or from one's yard to one's home. Interestingly, this was true only for those with more severe reductions in eGFRs, defined as eGFR < 45 mL/min/1.73 m^2, and not for those with eGFRs of 45-59 mL/min/1.73 m^2. Also, we found that participants with eGFRs < 45 mL/min/1.73 m^2 were more likely to have a decline in life-space mobility of 10 or more points compared with their counterparts with eGFRs ≥ 60 mL/min/1.73 m^2. Although prior studies have identified associations between reduced eGFR and difficulty with task-specific function and walking impairment, life-space mobility captures community mobility across the full continuum of function.

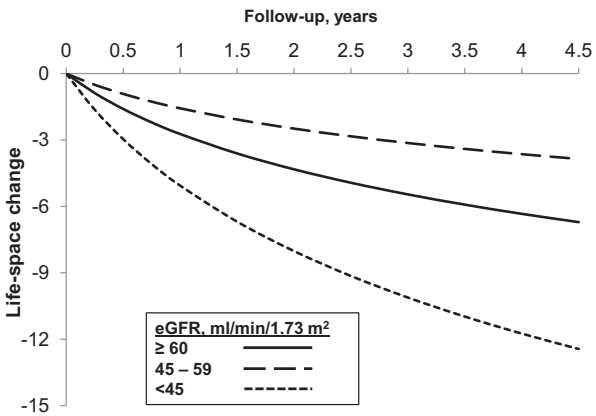

Figure 2. Logarithmic trajectory of life-space change by estimated glomerular filtration rate (eGFR) category. Adjusted for age, race, sex, rural residence, marital status, transportation difficulty, current smoking, less than high school education, diabetes, hypertension, stroke, peripheral vascular disease, obesity, coronary artery disease, hemoglobin level, Mini-Mental State Examination score, and Geriatric Depression Scale score.

Table 2. Parameter Estimates for Logarithmic Trajectory of Life-Space Mobility by eGFR Category

	Intercept (95% CI)	*P*	Slope (95% CI)	*P*
		Unadjusted		
eGFR category				
≥60	Reference		Reference	
45-59	−3.4 (−8.4 to 1.7)	<0.001	1.7 (−1.3 to 4.7)	0.3
<45	−14.0 (−19.8 to −8.1)	<0.001	−3.4 (−6.7 to 0.3)	0.07
		Multivariable Adjusted[a]		
eGFR category				
≥60	Reference		Reference	
45-59	−1.5 (−5.5 to 2.6)	0.5	1.6 (−1.4 to 4.6)	0.3
<45	−3.0 (−7.9 to 1.8)	0.2	−3.3 (−6.8 to 0.2)	0.06

Note: eGFRs expressed in mL/min/1.73 m^2.

Abbreviations: CI, confidence interval; eGFR, estimated glomerular filtration rate.

[a]Includes adjustment for age, race, sex, rural residence, marital status, transportation difficulty, current smoking, less than high school education, diabetes, hypertension, stroke, peripheral vascular disease, obesity, coronary artery disease, hemoglobin level, Mini-Mental State Examination score, and Geriatric Depression Scale score.

Life-space is a broad measure of mobility and social participation, and declines in life-space likely are related to complex relationships between multiple factors that are part of physical, cognitive, social, and psychological health.[6] Although it is unlikely that a single unifying mechanism can be identified to explain the associations we found, moderately to severely reduced eGFR (ie, <45 mL/min/1.73 m^2) may contribute to life-space decline in several ways. Recent studies have shown that among people 80 years or older, CKD is associated with an increased prevalence of concurrent complications of CKD (eg, anemia and acidosis) and cardiovascular disease.[1,16] Further, among older adults, CKD is associated with non–disease-specific problems, including poor physical performance, cognitive impairment, and frailty.[17-19] These conditions may contribute to the decline in life-space mobility directly or through hospitalizations related to these conditions. The presence of concurrent complications, frailty, and risk for hospitalization is greatest at lower eGFRs and may explain our findings of a significant decline in life-space mobility only among those with eGFRs < 45 mL/min/1.73 m^2.

Table 3. Risk Ratios for Decline in Life-Space Mobility by 10 or More Points by eGFR Category

		RR (95% CI)	
eGFR Category	**Life-Space Decline ≥ 10 Points**[a]	**Unadjusted**	**Multivariable Adjusted**[b]
≥60 (n = 194)	93 (47.9%)	1.00 (reference)	1.00 (reference)
45-59 (n = 117)	46 (39.3%)	0.82 (0.63-1.07)	0.85 (0.65-1.10)
<45 (n = 79)	48 (60.8%)	1.27 (1.01-1.60)	1.33 (1.05-1.70)

Note: eGFRs expressed as mL/min/1.73 m^2.

Abbreviations: CI, confidence interval; eGFR, estimated glomerular filtration rate; RR, risk ratio.

[a]Decline in life-space mobility score of 10 or more points from baseline to last available follow-up.

[b]Includes adjustment for age, race, sex, rural residence, marital status, transportation difficulty, current smoking, less than high school education, diabetes, hypertension, stroke, peripheral vascular disease, obesity, coronary artery disease, hemoglobin level, Mini-Mental State Examination score, Geriatric Depression Scale score, baseline life-space mobility score, and length of follow-up.

Our findings are consistent with those of previous studies of functional impairment and CKD in older adults, but they also improve the understanding of reduced eGFR in this population. Several studies have evaluated the association of eGFR with task-specific measures of function, physical performance measures, and walking mobility.[20] For example, we previously have shown reduced eGFR to be associated with a decline in basic and instrumental activities of daily living.[4] A cystatin C concentration ≥1.13 mg/L also has been shown to be associated with the development of a persistent inability to walk one-quarter mile or climb 10 steps.[5] In contrast to previously studied task-specific measures that describe what participants are capable of doing, life-space assessments identify what participants actually did during the past 4 weeks and reflect community mobility and social participation. In a recent systematic review, Purnell et al[21] performed a comprehensive evaluation of studies comparing life-participation activities among adults treated with hemodialysis, peritoneal dialysis, and kidney transplantation. The authors noted that an important limitation to previous studies was the heterogeneity in outcomes used to assess social participation and outcome assessments that were

obtained at only one time point. Life-space mobility may be used in future studies to determine the impact of renal replacement treatment modalities on community mobility and social participation over time.

Findings from the present study have important clinical and public health implications. First, older adults often report health goals in terms of their ability to maintain functional independence and engage in social activities rather than achieving disease-specific goals. Although CKD management that addresses correcting concentrations of biomarkers (eg, GFR, phosphorus, and hemoglobin) and disease-specific indicators (eg, blood pressure) may be effective for reducing adverse health outcomes in younger populations, among older adults, who often have multiple comorbid conditions, functional impairment, and decreased life-expectancy, addressing disease-specific outcomes alone may be inappropriate or ineffective in improving outcomes of importance to them.[22,23] A decline in life-space mobility of more than 12 points, as we have observed among those with eGFRs < 45 mL/min/1.73 m^2, may affect a person's ability to move outside of his or her neighborhood and may limit him or her from visiting with friends or attending physician's appointments. For these individuals, identifying interventions to improve or maintain life-space mobility may have an important role in an individualized approach to CKD management by allowing them to meet their health goals.

Second, life-space mobility may provide important prognostic information about mortality and incident functional impairment for community-dwelling older adults independent of traditional risk factors.[9,24] For example, compared with older adults with life-space scores of 90 or higher, those with life-space scores of 60-89 are twice as likely to die during 4 years of follow-up, and those with life-space mobility scores lower than 30 are more than 10 times as likely to die during 4 years.[9] Future studies are needed to determine whether evaluation of life-space mobility may improve clinical decision making or provide context to reframe discussions on preparation for dialysis therapy in terms of the patient's health goals.[25]

Findings from the present analysis should be considered in the context of known and potential limitations. Serum creatinine concentration was available from a one-time blood draw; longitudinal changes in eGFR were not assessed and misclassification is possible. Also, urinary albumin excretion provides important information about CKD severity and prognosis, but was not available in the UAB Study of Aging.[26,27] Although we adjusted for potential confounders such as anemia, we did not have available data on other CKD complications such as metabolic acidosis, which may contribute to muscle weakness, frailty, and subsequent decline in life-space mobility.[28] Although there were no significant differences between the number of follow-up life-space measures by eGFR category, bias due to differential drop out from death, especially among those with very low eGFRs, is possible. However, loss of follow-up of those with more severe reductions in eGFR may underestimate the true differences in life-space mobility trajectory. Last, participants included a sample of older adults from 5 central Alabama counties who were alive after 4 years of the UAB Study of Aging and able to give consent for a second in-home visit. Findings from this analysis may not be generalizable to the broader US population. Despite these potential limitations, the longitudinal design and multiple assessments of life-space mobility during follow-up are strengths of the present analysis. Mobility is a dynamic process involving transitions between periods of difficulty and recovery, and the trajectory analysis approach used here included all available life-space scores.[8]

In conclusion, among community-dwelling older adults, eGFR < 45 mL/min/1.73 m^2 was associated with an accelerated decline in life-space mobility trajectory. With the aging of the US population, increasing prevalence of CKD, and emphasis on providing patient-centered care,[22] evaluation of life-space mobility may provide health information not reported by traditional functional assessment. Future studies are needed to confirm the findings from the present analysis in a larger population and identify factors associated with decline in life-space mobility among older adults with CKD in order to target those with highest risk for declines in mobility. Additional research is needed to determine the benefit of life-space mobility assessment for clinical decision making regarding preparation for dialysis and advanced care planning among older adults with progressive kidney disease.

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SUPPLEMENTARY MATERIAL

Table S1: Baseline characteristics of those included and excluded from current analysis.

Table S2: Life-space mobility over 4 years' follow-up by eGFR level.

Figure S1: Participant selection for current analysis from UAB Study of Aging.

Note: The supplementary material accompanying this article (http://dx.doi.org/10.1053/j.ajkd.2013.07.023) is available at www.ajkd.org

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APPENDIX

Components of the Composite Life-Space Mobility Score

Life-Space Level: During the past 4 weeks, have you been to…	Frequency: How often did you get there?	Independence: Did you use aids or equipment? Did you need help from another person?	Level Subscore[a]
Level 1: Other rooms of your home besides the room where you sleep? 1 = yes 0 = no	1 = <1×/wk 2 = 1-3×/wk 3 = 4-6×/wk 4 = daily	1 = Personal assistance 1.5 = Equipment only 2 = No equipment or personal assistance	Level 1 subscore
Level 2: An area outside your home such as your porch, deck, or patio, hallway (of an apartment building) or garage, in your own yard or drive way? 2 = yes 0 = no	1 = <1×/wk 2 = 1-3×/wk 3 = 4-6×/wk 4 = daily	1 = Personal assistance 1.5 = Equipment only 2 = No equipment or personal assistance	Level 2 subscore
Level 3: Places in your neighborhood, other than your own yard or apartment building? 3 = yes 0 = no	1 = <1×/wk 2 = 1-3×/wk 3 = 4-6×/wk 4 = daily	1 = Personal assistance 1.5 = Equipment only 2 = No equipment or personal assistance	Level 3 subscore
Level 4: Places outside your neighborhood, but within your town? 4 = yes 0 = no	1 = <1×/wk 2 = 1-3×/wk 3 = 4-6×/wk 4 = daily	1 = Personal assistance 1.5 = Equipment only 2 = No equipment or personal assistance	Level 4 subscore
Level 5: Places outside your town? 5 = yes 0 = no	1 = <1×/wk 2 = 1-3×/wk 3 = 4-6×/wk 4 = daily	1 = Personal assistance 1.5 = Equipment only 2 = No equipment or personal assistance	Level 5 subscore

Note: The sum of level subscores is equal to the life-space composite score.

[a]Level subscore = Life-space level × Frequency × Independence.