An ambulatory senior health clinic was developed using the chronic care model (CCM), with emphasis on an interdisciplinary team approach. To determine the effect of this care model approach in a nonprofit healthcare system, an observational, longitudinal panel study of community-dwelling Medicare beneficiaries was performed to examine the effect on physical function and health-related quality of life (HRQL). Participants in the study were recruited from a community sample of 6,864 eligible Medicare beneficiaries. Informed consent and baseline data were obtained from 1,709 individuals (recruitment response rate = 25%) and complete data across 30 months from 1,307 (completion response rate = 76%). Participants receiving care in the CCM-based senior healthcare practice (n = 318) were compared with patients of primary care physicians supported by care managers (n = 598) and a group without care managers (n = 391). Self-reported data were collected over the telephone to measure physical function and HRQL at baseline and 6, 18, and 30 months. A multiple group mixture growth model was used to analyze physical function and HRQL across the 30 months. Physical function and HRQL mean scores decreased across time in all participants and were moderately correlated at each wave (correlation coefficient = 0.74–0.79). Two latent growth classes were identified. In class 1, physical function decreased, and HRQL remained stable across time. In class 2, physical function and HRQL decreased in parallel. Ninety-seven percent of intervention group patients were in class 1, and 99% of patients in comparison groups 1 and 2 were in class 2. Despite physical function decline, patients in a senior health clinic care model maintained HRQL over time, whereas patients receiving traditional care had physical function and HRQL decline. An interdisciplinary team CCM approach appears to have a positive effect on HRQL in this population. J Am Geriatr Soc 56:1342–1348, 2008.
tion\textsuperscript{3,12,13} or primary care physician and staff training.\textsuperscript{14} Whatever the new care model approach, each is challenged by an ever-changing national healthcare regulatory and reimbursement context, regional variations between provider networks, absence of valid outcome measures, shortages of geriatric healthcare workers, and provider inexperience with team processes.\textsuperscript{8,15}

The emphasis on improving quality of life and health status through healthcare policies and programs was the primary goal of the Healthy People 2010 report\textsuperscript{16,17} and has emerged as a primary message for healthy and successful aging.\textsuperscript{16} Factors or behaviors that lead to or make a significant contribution to improvement in quality of life for older adults are key research issues. Physical function status and aspects of health-related quality of life (HRQL) are instrumental to understanding the effect of disease processes and the subsequent general approach to care.\textsuperscript{18} Many factors account for the decline in physical activity, especially for those who are vulnerable, for example, age, physiology, personality, emotional status, social support, and beliefs about the health effects of physical activity. One also may have significant physical function deficits yet report high quality of life. Prior research results support the notions that physical activity, including structured intervention programs, can affect the physical and mental function of older adults positively and that physical activity, regardless of the age or health of participants, can positively influence HRQL.\textsuperscript{18} However, less is known about other factors or interventional approaches that may influence physical function and HRQL outcomes.

The present study is an attempt to answer the question of whether an interdisciplinary geriatric practice team in a primary care setting designed using the CCM produces better health status outcomes for Medicare beneficiaries. In other words, does a comprehensive, geriatric-focused model of care affect self-reported physical function and HRQL outcomes, and what is the relationship between them?

METHODS

Study Design

A longitudinal panel design was used in which community-dwelling patients of clinics representing three different care models were followed across four data collection waves: baseline and 6, 18, and 30 months after baseline. The primary means of data collection was a telephone survey performed by an independent survey research service, the University of Oregon Survey Research Laboratory (Eugene, OR), with an interview schedule containing questions designed to measure a wide range of patient attributes.\textsuperscript{20} The PeaceHealth System institutional review board approved the study protocols, and written informed consent was obtained from all patients.

Recruitment

Study eligibility was determined according to the following criteria: aged 66 and older at baseline; Medicare fee for service for insurance, and receipt of some level of physician care within the 12 months before baseline (May 1, 2000, through April 30, 2001). Primary care physicians (n = 59) sent a letter of invitation to participate in the study to 6,864 eligible individuals (Figure 1); 2,210 individuals indicated interest in participation by telephone or mail and were subsequently sent informed consent information. Informed consent was obtained from 1,709 (recruitment response rate = 25\%) community-dwelling Medicare beneficiaries who agreed to participate and provided data at baseline. Complete self-reported data across the four periods were collected using telephone interviews from 1,307 patients (completion response rate = 76\%) in the three study groups recruited from three patient populations: patients in a SHC (intervention group, n = 318), patients of primary care physicians supported by care managers (comparison group 1, n = 598), and patients of primary care physicians without care managers (comparison group 2, n = 391).

Intervention Model

A number of innovative initiatives and applied lessons learned in the evolution of the SHC during the past 2 decades influenced the SHC (Senior Health and Wellness Center, Eugene, OR) for this study. These include a “Voice of the Customer” process, modeled after the auto industry’s “Lean Thinking” concept,\textsuperscript{21} a “Plan-Do-Study-Act” quality-improvement methodology, and focus groups (healthy and frail seniors) to test concepts and practice innovations.

Most importantly, the SHC development team used the CCM as a framework for designing a geriatric-focused primary care clinic and an interdisciplinary team approach functioning within an integrated healthcare system. The SHC development was predicated on the assumption that improving the quality of care would lead to a more cost-effective, efficient system of care that meets patients’ clinical, functional, and preference needs. All patients in the SHC are screened for risk status (Health and Risk Tool, Providence Health System, Portland, OR) at entry into the clinic, and a comprehensive geriatric-focused evaluation is completed. The interdisciplinary clinical practice team includes geriatricians, nurse practitioners, a medical social worker, nurses, receptionists, a pharmacist, and a dietitian. Ad hoc members at a weekly care planning team meeting include a chaplain, physical therapist, home health nurse, and patient information librarian.

Each geriatrician in this model provides primary care for approximately 700 patients, as well as geriatric consultations for community physicians. Examples of clinic on-site services included dietary counseling, social work and care coordination services, weekly interdisciplinary team review for complex care plans, standardized medication review and co-management by a pharmacist, and audiology services. All providers use a shared electronic medical record across the inpatient, outpatient, and subacute care settings, including laboratory and radiology. A hospitalist team manages inpatient medical care with communications using the telephone and e-mail. A separate geriatrician and nurse practitioner team collaboratively staff community postacute care facilities, manage long-term care for patients, see patients presenting for urgent and primary care in the SHC, and participate as needed in the weekly care conferences. A more-detailed description of the SHC features as they relate to interdisciplinary teams and the CCM has been published previously.\textsuperscript{22}
Comparison Groups
Participants for the study comparison groups were recruited from two care settings. Both settings were part of the same larger integrated healthcare system. Comparison group 1 participants received their care from internists and family physicians practicing in a multispecialty group located in a medium-sized metropolitan area. These practices are located in satellite clinics throughout the community in groups of five to 13 providers at each satellite. A social work–trained or registered nurse–trained care coordinator supports all of these practices to assist in caring for patients with complex medical or psychological conditions. Comparison group 2 participants were recruited from two rural communities where the health system owns and operates primary care practices, critical access hospitals, and emergency departments. Neither of the two rural clinics had formal care management support, and coordination of care was managed in the traditional manner.

Measurement
In this study, Rasch mathematical model–derived measurement self-report survey tools developed by the PeaceHealth Survey Development and Research Division (System Office, Bellevue, WA) were used: the Physical Function Survey (survey scale range = 0–100, Cronbach α = 0.95) and the 24-item Health-Related Quality of Life (survey scale range = 0–100, Cronbach α = 0.91), an instrument derived from the 36-item Medical Outcomes Study Short-Form Health Survey database.23–25 A comprehensive discussion of the characteristics of summated rating (e.g., Likert), item response theory, and Rasch psychometric approaches to survey development is described elsewhere.26

Statistical Analysis
In any longitudinal study, identifying the nature of change accurately across time is vital, and simple change scores are inadequate for detecting unobserved heterogeneity in change. An Mplus growth model approach to examine the existence of latent growth classes with different and substantively meaningful growth trajectories on the particular outcome variable of interest was used to identify unobserved heterogeneity in physical function and HRQL growth trajectories.27 This analysis model is the most powerful, relevant, and rigorous of all options for this type of longitudinal panel study.28
Models were examined that used physical function and HRQL as health status variables so that the latent growth classes could be examined as a combined health status variable rather than two separate variables. It was hypothesized that this combined health status trajectory would be able to differentiate differences between the care models. In addition, this new growth model included the care model as a variable in seeking to identify latent growth classes. This form of growth model is a growth mixture model with known classes (i.e., a multiple group growth mixture model).

An unobserved categorical latent class variable was developed in which class membership is unknown and a categorical latent class variable in which class membership is known, with the latter being the care model. The hypothesized model has been illustrated previously. The following parameters define the latent growth classes in this study: the individual patient’s baseline physical function (intercept), the slope of the individual patient’s physical function change, the individual patient’s baseline HRQL (intercept), the slope of the individual patient’s HRQL change, and the care model in which the patient was receiving care. Mplus latent variable analysis was used to evaluate the latent class growth mixture models of different known groups.

RESULTS

Participant Characteristics

Table 1 describes the demographic characteristics of the three study groups. The intervention group participants were older, more likely to be female, had less education, more chronic conditions, worse scores on a mental status questionnaire, and a higher percentage rated their health as fair or poor than did the two comparison groups.

Table 1 also outlines the baseline outcome measure scores for the three study groups. Again, the intervention group had lower physical function, lower HRQL scores, higher depression scores, lower perceived health competence, and more activities of daily living dependencies than did the comparison groups.

Figure 1 summarizes retention of participants through 30 months of data collection. Across 30 months, 402 (23.5%) participants dropped out of the study. For those 402, the most common attrition reasons were that they refused to be interviewed or decided not to continue the study at one of the waves (38.1%) or that they died during the study (23.5%). Participants dropped out of the study (32.3%). As shown in Table 1, the intervention sample had the highest completion rate (72.8%), and the comparison group 1 sample had the highest completion rate (79.2%). Reasons for dropping out, including death, did not differ significantly according to study group (chi-square = 13.42, P = .10) (Figure 1).

Physical Function and HRQL

For all study participants, mean physical function scores decreased from baseline to 30 months, and 30-month mean score (mean 56.0, 95% confidence interval (CI) = 55.0–57.0) was significantly lower than baseline (mean 59.9, 95% CI = 58.9–60.9). HRQL mean scores for all participants across all waves of the 30-month study were significantly lower than baseline (mean 59.9, 95% CI = 58.9–60.9). HRQL mean scores for all participants across all waves of the 30-month study were significantly lower than baseline (mean 59.9, 95% CI = 58.9–60.9).

Table 1. Patient Characteristics at Baseline

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Intervention</th>
<th>Comparison 1</th>
<th>Comparison 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients beginning study, n</td>
<td>437</td>
<td>755</td>
<td>517</td>
</tr>
<tr>
<td>Patients completing study, n</td>
<td>318</td>
<td>598</td>
<td>391</td>
</tr>
<tr>
<td>Study completion, %</td>
<td>72.8</td>
<td>79.2</td>
<td>75.6</td>
</tr>
<tr>
<td>Age, mean</td>
<td>76.1</td>
<td>75.6</td>
<td>74.6</td>
</tr>
<tr>
<td>Aged ≥80, %</td>
<td>26.4</td>
<td>21.6</td>
<td>14.8</td>
</tr>
<tr>
<td>Male, %</td>
<td>28.0</td>
<td>37.0</td>
<td>44.0</td>
</tr>
<tr>
<td>Female, %</td>
<td>72.0</td>
<td>63.0</td>
<td>56.0</td>
</tr>
<tr>
<td>Education, % completing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade school</td>
<td>3.8</td>
<td>3.6</td>
<td>2.0</td>
</tr>
<tr>
<td>High school</td>
<td>40.0</td>
<td>26.8</td>
<td>28.6</td>
</tr>
<tr>
<td>More than high school</td>
<td>56.2</td>
<td>71.2</td>
<td>67.8</td>
</tr>
<tr>
<td>Mean Short Portable Mental Status Questionnaire score&lt;sup&gt;29&lt;/sup&gt;</td>
<td>0.95&lt;sup&gt;3&lt;/sup&gt;</td>
<td>0.60</td>
<td>0.62</td>
</tr>
<tr>
<td>Self-rated health, %</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>5.7&lt;sup&gt;1&lt;/sup&gt;</td>
<td>9.9&lt;sup&gt;1&lt;/sup&gt;</td>
<td>8.7</td>
</tr>
<tr>
<td>Very good</td>
<td>25.5</td>
<td>29.6</td>
<td>29.9</td>
</tr>
<tr>
<td>Good</td>
<td>39.9</td>
<td>42.1</td>
<td>39.9</td>
</tr>
<tr>
<td>Fair</td>
<td>22.6&lt;sup&gt;8&lt;/sup&gt;</td>
<td>15.1</td>
<td>16.4</td>
</tr>
<tr>
<td>Poor</td>
<td>6.3&lt;sup&gt;1&lt;/sup&gt;</td>
<td>3.3&lt;sup&gt;1&lt;/sup&gt;</td>
<td>5.1</td>
</tr>
<tr>
<td>Caregiver in previous 12 months, %</td>
<td>20.3</td>
<td>17.5</td>
<td>16.3</td>
</tr>
<tr>
<td>Number of chronic conditions, mean&lt;sup&gt;6&lt;/sup&gt;</td>
<td>2.8&lt;sup&gt;8&lt;/sup&gt;</td>
<td>2.3</td>
<td>2.2</td>
</tr>
<tr>
<td>Perceived health competence, mean&lt;sup&gt;4&lt;/sup&gt;</td>
<td>59.9&lt;sup&gt;**&lt;/sup&gt;</td>
<td>65.2&lt;sup&gt;**&lt;/sup&gt;</td>
<td>62.5&lt;sup&gt;**&lt;/sup&gt;</td>
</tr>
<tr>
<td>Physical function, mean&lt;sup&gt;7&lt;/sup&gt;</td>
<td>56.9&lt;sup&gt;5&lt;/sup&gt;</td>
<td>62.5</td>
<td>60.3</td>
</tr>
<tr>
<td>Depression, mean&lt;sup&gt;4&lt;/sup&gt;</td>
<td>33.3&lt;sup&gt;8&lt;/sup&gt;</td>
<td>28.1</td>
<td>28.8</td>
</tr>
<tr>
<td>Health-related quality of life, mean&lt;sup&gt;4&lt;/sup&gt;</td>
<td>56.7&lt;sup&gt;5&lt;/sup&gt;</td>
<td>60.9</td>
<td>59.4</td>
</tr>
<tr>
<td>Number of activities of daily living dependencies, mean&lt;sup&gt;4&lt;/sup&gt;</td>
<td>0.65&lt;sup&gt;5&lt;/sup&gt;</td>
<td>0.38</td>
<td>0.34</td>
</tr>
<tr>
<td>Influenza vaccine in previous 12 months, %</td>
<td>72.2</td>
<td>76.6</td>
<td>79.5</td>
</tr>
<tr>
<td>Pneumonia vaccine in previous 12 months, %</td>
<td>87.3</td>
<td>82.9</td>
<td>82.8</td>
</tr>
<tr>
<td>Limit going outside for fear of falling, %</td>
<td>14.4&lt;sup&gt;8&lt;/sup&gt;</td>
<td>8.2</td>
<td>8.0</td>
</tr>
</tbody>
</table>

<sup>1</sup>Patients cared for by primary care physicians supported by care managers.
<sup>2</sup>Patients cared for by primary care physicians without care management support.
<sup>3</sup>Comparison 2 group significantly differed from intervention and comparison 1 groups. Significance determined with 95% confidence intervals (CIs) for means and P < .05 (one-sided Fisher exact test) for percentages.
<sup>4</sup>Intervention group significantly differed from comparison 1 and comparison 2 groups. Significance determined with 95% CIs for means and P < .05 (one-sided Fisher exact test) for percentages.
<sup>5</sup>Intervention and comparison 1 groups differed significantly (P < .05, one-sided Fisher exact test) from each other.
<sup>6</sup>Rasch survey scale 0 to 100, with 0 the lowest possible score and 100 the highest possible score.
<sup>7</sup>Intervention group and comparison 1 and comparison 2 groups differed significantly (95% CIs) from each other.
Significantly lower at 30 months (mean 55.9; 95% CI 55.2–56.7) than at baseline (mean 59.0; 95% CI 58.3–59.7). At each of the four data collection waves, physical function correlated with HRQL (correlation coefficient 0.74–0.79).

Physical Function—HRQL Known Groups Latent Class Growth Model Analysis

Three different latent growth class models, differing only in the number of growth classes, were evaluated for their fit with the data. The best-fitting model was one with two latent growth classes (entropy = 0.979). A three-class model (entropy = 0.938) and a four-class model (entropy = 0.895) had poorer fit. This best-fitting two-class model states that there are two physical-function–HRQL growth classes, that the physical-function and HRQL change trajectories of these two classes differ, and that the two classes are a function of study group. The study group configuration of these two growth classes is that 97% of intervention group patients are in latent growth class 1 and that 99% of comparison group 1 and comparison group 2 patients are in latent growth class 2.

The physical function and HRQL change trajectories of growth class 1 (intervention group patients) and growth class 2 (comparison groups 1 and 2) are shown in Figure 2. The physical function and HRQL change trajectories of growth class 1 (intervention group patients) and growth class 2 (comparison groups 1 and 2) are shown in Figure 2. The physical function and HRQL change trajectories of growth class 1 (intervention group patients) and growth class 2 (comparison groups 1 and 2) patients combined,

![Figure 2. Mean physical function and health-related quality of life (HRQL) growth trajectories of (A) latent growth class 1 (intervention) and (B) latent growth class 2 (comparison groups 1 and 2).](image)

![Table 2. Physical Function and Health-Related Quality of Life (HRQL) Means and 95% Confidence Intervals (CIs)](table)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical function</td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>56.3 (54.2–58.3)</td>
</tr>
<tr>
<td>6 months</td>
<td>55.0 (53.0–57.0)</td>
</tr>
<tr>
<td>18 months</td>
<td>54.4 (52.4–56.4)</td>
</tr>
<tr>
<td>30 months</td>
<td>51.8 (49.8–53.8)</td>
</tr>
<tr>
<td>HRQL</td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>56.0 (54.6–57.3)</td>
</tr>
<tr>
<td>6 months</td>
<td>54.9 (53.1–55.9)</td>
</tr>
<tr>
<td>18 months</td>
<td>55.2 (53.8–56.7)</td>
</tr>
<tr>
<td>30 months</td>
<td>53.6 (52.1–55.1)</td>
</tr>
</tbody>
</table>

*Absolute number of participants according to study group whose data conform to growth class 1 or growth class 2.

1Physical function change was significant (95% CI) from baseline to 30 months.

1HRQL change was significant (95% CI) from baseline to 30 months.
regressing total HRQL change on baseline HRQL. For all patients in both classes, baseline HRQL was related significantly to the amount of change from baseline to 30 months ($F = 71.73$, degrees of freedom ($df$) = 1/1,283, $P < .001$, adjusted coefficient of determination ($R^2$) = 0.052), although the relationship is negative ($\beta = -0.177$), meaning that the higher the baseline HRQL, the less the change from baseline to 30 months. The same analysis was conducted for intervention group (class 1) patients only. Baseline HRQL had no significant relationship to the amount of change from baseline to 30 months ($F = 3.23$, $df = 1/306$, $P = .07$, adjusted $R^2 = 0.007$). These regression analysis results suggest that HRQL in the intervention group patients did not decline significantly, whereas HRQL in the comparison group patients declined significantly from baseline to 30 months, so HRQL decline was not simply a function of intervention group patients having had a lower baseline HRQL.

**DISCUSSION**

Physical function and HRQL change were evaluated across time in community-dwelling older adults. The results indicate that there were two groups of patients with different change trajectories, or paths of decline, across the 30 months of the study. One path was to have physical function decline yet be able to maintain HRQL. The second path was for physical function and HRQL both to decline from baseline to 30 months. Virtually all of the intervention group patients (97%) being cared for in the SHC care model were in the former path, whereas virtually all of the comparison group participants (99%) followed the second path.

Why did the SHC participants maintain their quality of life status despite physical function decline? One reason may have been the focus that geriatricians and this care model placed on maintaining or improving the function of older adults rather than curing their chronic conditions or focusing only on acute health issues. Helping patients and their caregivers understand the patients’ chronic conditions through examining ways in which patients can optimize their function may assist in maintaining the patients’ perceived HRQL despite the natural history of decline in physical function. Addressing pain, engaging family members and caregivers in care conversations, leveraging care team resources such as physical therapists, using social work interventions, optimizing medication management through pharmacist interventions, and connecting patients to community support services are all influences in an interdisciplinary team model that may have affected the outcome of this analysis.

The findings of this longitudinal study support the hypothesis that a SHC modeled after the CCM, with an interdisciplinary, interdependent team approach, delivers better health status outcomes. Older adults receive only half of the recommended care that they need for chronic conditions. Solutions to this problem thus far have focused mainly on the management of specific diseases, such as diabetes mellitus, heart failure, and depression. The CCM is effective in helping to develop services to improve the delivery of care for those diseases, as are a number of other disease-management strategies, but most older adults have more than one chronic condition, and little is known about how to provide optimal care to those older, more vulnerable adults with multiple chronic conditions, many of which interact with each other. Perhaps this notion that a more-comprehensive, broader approach to care focusing on patient involvement; an effective, interdisciplinary, interdependent care team; community and health system service integration; and focused disease-management protocols will contribute to the collective knowledge about how best to deliver safe, effective, and efficient care to older adults.

The Mplus latent class growth models provide valuable information about physical function and HRQL change across time. The ability to identify relatively homogeneous classes of patients with different physical function and HRQL growth trajectories across 30 months sets the foundation for a far more-useful investigation of the pathway of this aspect of health status than does simply considering mean physical function and HRQL scores across time for the sample as a whole. Attempting to understand precisely, in perhaps a structural equation model framework, which other factors besides care model distinguish these two growth classes and account for individual variability in physical function and HRQL change across time is a next step in the analysis but is beyond this report.

This study had several limitations. Demographically, this elderly population was predominantly white and resided in moderate-sized urban and semirural communities in one region of the United States. Another limitation was that the sample of participants followed in the study was 25% of the total eligible population. Whether the study participants recruited are representative of the total community sample is not completely known. Although this observational study occurred across 30 months, it is still unknown what may have occurred before the study that may have influenced the outcomes and the subsequent trajectory of the two latent growth classes in the months after the study. Replication of these findings in other care settings with a more-diverse population and over a longer time could be valuable to validate this finding as supportive of a care model change on a broader national scale. It was not the aim of this study to evaluate the business model for providing this type of care, but further analysis of cost implications is an important aspect to consider in future analyses of this model. Finally, although a number of interventions seem to have affected the improved health status of the intervention group, the degree to which different interventions influenced the effect is still unknown. It is also unknown whether there are special populations (e.g., vulnerable elderly population) within the intervention group that would respond to these interventions more than others, although it is clear from baseline demographic and health status findings that the intervention group was more likely to be vulnerable, implying that this population would benefit more from this model of care.

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Author Contributions: Drs. Stock and Mahoney had full access to all of the data in the study and take full responsibility for the integrity of the data and the accuracy of the data analysis. Statistical expertise: Mahoney. Obtaining funding: Stock, Reece, Cesario. Administrative, technical, or material support: Stock, Reece, Cesario. Study concept and design: Stock, Mahoney, Reece, Cesario. Analysis and interpretation of data: Stock, Mahoney. Drafting of the manuscript: Stock, Mahoney. Critical revision of the manuscript for important intellectual content: Stock, Mahoney.

Sponsor’s Role: The funding organizations had no role in the design or conduct of the study; collection, management, analysis, or interpretation of the data; or preparation, review, or approval of the manuscript.

REFERENCES

29. Stock ET AL. JULY 2008–VOL. 56, NO. 7 JAGS 1348