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AGING & HEALTH

Home-Based Care Program Reduces Disability And Promotes Aging In Place

Sarah L. Szanton (sszanto1@jhu.edu) is an associate professor of nursing and of health policy and management at Johns Hopkins University, in Baltimore, Maryland.

Bruce Leff is an associate professor of medicine and nursing at Johns Hopkins University.

Jennifer L. Wolff is an associate professor of health policy and management at Johns Hopkins University.

Laken Roberts is PhD student in nursing at Johns Hopkins University.

Laura N. Gitlin is a professor of nursing and medicine at Johns Hopkins University.

ABSTRACT The Community Aging in Place, Advancing Better Living for Elders (CAPABLE) program, funded by the Center for Medicare and Medicaid Innovation, aims to reduce the impact of disability among low-income older adults by addressing individual capacities and the home environment. The program, described in this innovation profile, uses an interprofessional team (an occupational therapist, a registered nurse, and a handyman) to help participants achieve goals they set. For example, it provides assistive devices and makes home repairs and modifications that enable participants to navigate their homes more easily and safely. In the period 2012–15, a demonstration project enrolled 281 adults ages sixty-five and older who were dually eligible for Medicare and Medicaid and who had difficulty performing activities of daily living (ADLs). After completing the five-month program, 75 percent of participants had improved their performance of ADLs. Participants had difficulty with an average of 3.9 out of 8.0 ADLs at baseline, compared to 2.0 after five months. Symptoms of depression and the ability to perform instrumental ADLs such as shopping and managing medications also improved. Health systems are testing CAPABLE on a larger scale. The program has the potential to improve older adults' ability to age in place.

The shift in the United States toward value-based care has elevated awareness that drivers of health largely fall outside of the bricks-and-mortar facilities of the health care system and can be found in the places where people live, work, and play.^{1–3} The importance of addressing such drivers, or determinants, of health is becoming increasingly clear. As a result, the Center for Medicare and Medicaid Innovation (CMMI) is funding innovative programs that seek to improve the quality of health care, reduce the cost of care, and improve the US population's health by addressing non-medical factors.^{4,5} The hypothesis driving these investments is that many high-cost users have problems that are unaddressed in traditional

health care models, which ultimately leads to avoidable health care utilization.⁶

Difficulty with everyday physical functioning—the ability to perform both basic (for example, dressing, bathing, and walking) and instrumental (such as going shopping or managing one's medications) activities of daily living—is a major cost driver that is typically overlooked and unaddressed in traditional medical care.⁷ However, people with functional limitations and chronic conditions are more than four times more likely than the general population to be among the 5 percent top of users of all health services.⁸ Moreover, an estimated \$219 billion is spent annually on long-term services and supports for people unable to function independently.⁹

Addressing older adults' functional goals and home environments may hold particular promise for promoting aging in place. This innovation profile reports results from a demonstration project in Baltimore funded by the CMMI⁴ to evaluate Community Aging in Place, Advancing Better Living for Elders (CAPABLE), a person-directed program for older adults with physical disabilities that addresses both modifiable individual limitations and the environment.

Previous publications have reported the CAPABLE program's origins,^{10,11} findings from an initial pilot study conducted in 2009 and 2010,¹² the program's protocol for home visits,¹³ and results from the first hundred people to complete participation in a CMMI-funded demonstration project begun in 2012.¹⁴ Here we report the final outcomes of that project, which was the first examination of CAPABLE since the pilot. We describe CAPABLE's impact on participants' abilities to perform activities and instrumental activities of daily living, their depressive symptoms, and their home hazards in multivariate models. Because declines in functioning after hospitalization are a clinical and public health problem, we also examine results among people who had been hospitalized in the previous year. Finally, we describe the current uptake of the approach across the United States.

Program Overview

The CAPABLE program targeted functional goals (for example, to get upstairs, take a shower, and walk out the front door) that each participant identified as most important to him or her and the barriers that interfered with achieving these goals. The program was made available to eligible residents of all but the wealthiest neighborhoods in Baltimore, Maryland.

CAPABLE was a five-month structured program delivered by an occupational therapist, who made six visits to each participant; a nurse, who made four visits; and a handyman, who contributed up to a full day's work—providing home repairs, installing assistive devices, and making home modifications. Participants worked with the therapist and nurse to identify three achievable goals per discipline and examined the barriers to achieving those goals. In the case of safe bathing, barriers could include a slippery tub, muscle weakness, and lack of hand rails to help the participant get safely into and out of the tub. The handyman then made structural improvements needed for participants to overcome the barriers.

OCCUPATIONAL THERAPIST In the first two visits, the occupational therapist conducted a semi-structured clinical interview¹⁵ that helped partic-

ipants identify and prioritize up to three functional goals. For each of the goals, the therapist observed the participant's performance of the relevant activity. For example, if the participant reported difficulty bathing because he or she feared getting into and out of the tub, the therapist observed how the participant attempted to accomplish this task. For example, the participant might grab the soap dish for balance because there was no handrail available.

In addition, the occupational therapist assessed the home for safety issues such as unsafe flooring, poorly lit entrances, and loose banisters. The participant and the therapist identified environmental repairs, modifications, and assistive devices that would help the participant achieve his or her goals. The therapist then created a work order for the handyman prioritized by the participant's goals and within the \$1,300 budget set for each participant's dwelling.¹²

In the remaining four visits, the occupational therapist used motivational interviewing and action planning techniques to discuss with the participant ways to achieve the functional goals that he or she had chosen. For example, these could involve trying new techniques, performing actions in a different order, or being trained in the use of new assistive devices. The therapist coordinated home repairs and modifications with the handyman. In the final visit, the therapist and participant reviewed the goals and discussed how the participant might apply strategies that he or she had found useful to address future challenges.¹²

REGISTERED NURSE In the registered nurse's first visit, he or she used a semistructured interview to help the participant identify and prioritize up to three goals related to pain, depression, strength and balance, medication management, or communication with primary care providers.¹⁶ With the participant's permission, the nurse communicated with the primary care provider and the participant's family members about identified medical issues—for example, the participant might be taking three blood thinners when only one was required.¹⁷

In the subsequent three visits, the nurse and participant brainstormed and planned incremental actions to address each of the participant's goals. Together they refined strategies based on incremental changes the participant was making between visits. For example, the nurse and participant might decide to try having the participant use the toilet at specified intervals and changing when the participant took a diuretic, so that he or she was less likely to have to rush to the bathroom at night and risk a fall.

In the final visit, the nurse reviewed what the participant had found effective and helped the

participant think about ways to use what he or she had learned to address future challenges.¹³ Finally, the nurse wrote a letter to the primary care provider that summarized the participant's goals and how he or she had achieved them.

HANDYMAN The handyman was given the work order that the occupational therapist crafted based on the participant's goals. The handyman then paid a preliminary visit to the participant's home to investigate the setting. Within three weeks the handyman performed up to a full day's work in the home. Tasks could include lowering kitchen shelves, repairing wobbly railings, and installing lighting or grab bars in the bathroom.

Spending on assistive devices and home repairs and modifications ranged from \$72 to \$1,398 per participant. If the occupational therapist or handyman identified repairs that significantly exceeded the budget of \$1,300, the handyman made the financially feasible fixes that were most relevant to the participant's functional goals. For more expensive items such as new boilers or roofing repairs, the therapist referred the participant to public benefits such as weatherization funds or Community Development Block Grants.

Study Data And Methods

SAMPLE Participants in the demonstration project of the CAPABLE program were recruited in the period 2012–15 using multiple methods, which included mailings from Maryland's Medicaid program, presentations at senior centers, and word of mouth. Those eligible for the program were adults ages sixty-five and older who were dually eligible for Medicare and Medicaid and who reported having at least some difficulty in performing an average of four of eight activities of daily living (ADLs). In addition, participants had to be living in a house and could not be cognitively impaired, be receiving skilled home health care services, or have been hospitalized four or more times in the previous year.

ACTIVITIES OF DAILY LIVING Participants were asked whether they had difficulty performing one or more of the following eight essential ADLs: walking across a small room, bathing, dressing the upper body, dressing the lower body, eating, using the toilet, transferring in and out of bed, and grooming.^{18,19} Each task was scored from 0 to 2 depending on whether the person did not have difficulty and did not need help (0), did not need help but had difficulty (1), or needed help regardless of difficulty (2).

A change in one point on the scale is considered clinically meaningful.²⁰ Going from 0 to 2 is associated with an increased risk of nursing home placement or death.²¹ At the five-month

It is promising that favorable results were observed uniformly across demographic and chronic disease groups.

follow-up, a trained research assistant reassessed each participant without knowing his or her previous score. Later, a data analyst categorized each participant as having improved, stayed the same, or gotten worse.

INSTRUMENTAL ACTIVITIES OF DAILY LIVING Participants were asked to characterize their ability to perform instrumental ADLs (using the telephone, shopping, preparing food, doing light housekeeping, doing laundry, traveling independently, taking medications, and managing finances). Performance on each task ranged from 0 to 2 on the scale described above.²² As with ADLs, at the five-month follow-up a research assistant reassessed each participant on instrumental IADLs, and a data analyst categorized each participant as having improved, stayed the same, or gotten worse.

DEPRESSION At both the baseline and five-month follow-up, participants were asked about nine symptoms of depression using the Patient Health Questionnaire-9, which has been validated for diagnosing depression and determining the severity of depression.²³ Each participant was categorized as having improved, stayed the same, or gotten worse over the five-month period.

ANALYSES Of the 281 participants, 38 did not complete a five-month follow-up, 8 relied on a proxy respondent, and 1 provided incomplete answers. This left us with an analytic sample of 234 participants. We examined changes in basic and instrumental ADL limitations and depression from baseline to follow-up using multivariate linear regression models that accounted for differences in race and baseline age and depression score. We used paired *t*-tests to compare outcomes for participants who had been hospitalized in the previous year and those who had not.

LIMITATION The Center for Medicare and Medicaid Innovation funded the demonstration project as a quality improvement project without a

control group. As a result, we cannot conclude from this analysis that the participants' improvements were due to the CAPABLE program. To mitigate this limitation, we contracted with the Hilltop Institute at the University of Maryland, Baltimore County, to develop a comparison group matched to the participants by ZIP code of residence, previous use of health care, age, race, sex, and chronic conditions. The new group provided matched comparisons on use of health care, and we are conducting cost analyses with these data.

Study Results

Of the 234 participants whose data we analyzed, 83 percent were women, and 80 percent were African American. As required by the eligibility criteria, all of them lived at home with or without family members. Forty-five percent lived alone.

On average, participants had difficulty with 3.9 (standard deviation: 3.04) of the 8.0 ADLs at baseline (data not shown). This difficulty was reduced among 75 percent of participants during the five-month CAPABLE program (Exhibit 1). The average reduction was from difficulty in 3.9 activities to difficulty in 2.0 activities (SD: 2.0), a 49 percent improvement in physical functioning.

Difficulties with instrumental ADLs decreased in 65 percent of participants (Exhibit 1). The average decrease in difficulty was from 4.1 activities (SD: 2.09) to 2.9 activities (SD: 2.22) (data not shown). In multivariate models, age, race, and symptoms of depression at baseline were not significant predictors of functional improvements.

Depressive symptoms improved in 53 percent

of the participants (Exhibit 1). Home hazards decreased from an average of 3.3 hazards (SD: 1.83) to 1.4 hazards (SD: 1.14) (data not shown).

Participants benefited equally from the CAPABLE program whether or not they had been hospitalized in the previous year ($p = 0.14$; data not shown).

The average cost of delivering the program was \$2,825 per participant. This included all ten clinician visits, mileage, care coordination, supervision, home repair and modification (including parts and labor), and assistive devices, as well as overhead paid to the handyman organization. This is lower than the costs previously reported¹⁴ because costs were reduced with experience.

Discussion

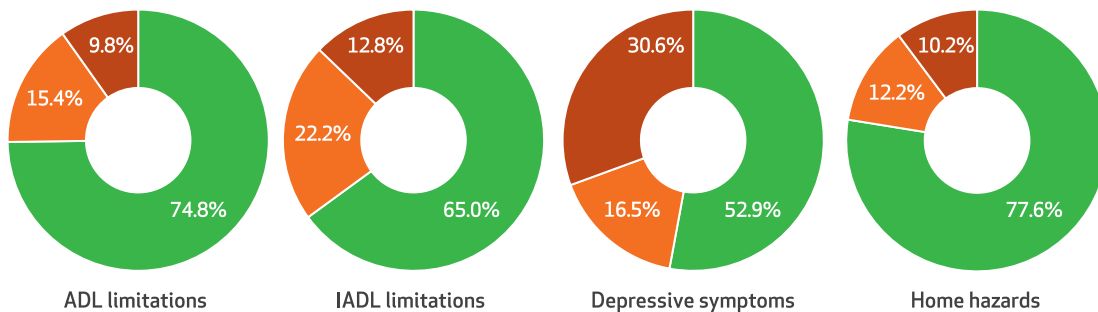
The CAPABLE program was associated with improved physical functioning in low-income older adults in one Maryland city who were dually eligible for Medicaid and Medicare. The practical effect of improving from four to two difficulties with ADLs can be life changing. For an older person who has difficulty getting out of bed, going to the toilet, getting dressed, and bathing, carrying out these functions with greater ease could enable him or her to continue living at home instead of having to move to an assisted living facility or nursing home.

It is promising that these favorable results were observed uniformly across demographic and chronic disease groups. None of the factors that often modify intervention success—such as age, race, sex, depression, and chronic illness—had an impact on these improvements. We are unable to determine the cause for the consistent findings we observed across groups with varying

EXHIBIT 1

Changes in limitations in activities of daily living (ADLs) and instrumental activities of daily living (IADLs), depressive symptoms, and home hazards among participants in the CAPABLE study

■ Improved ■ Stayed the same ■ Worsened



SOURCE Authors' analysis. **NOTES** The percentages show the shares of participants who improved, stayed the same, or did worse in any category from a baseline level to five-month follow-up. CAPABLE is Community Aging in Place, Advancing Better Living for Elders.

sociodemographic characteristics. However, we surmise that the person-directed orientation of the CAPABLE program, in which care is tailored to meet individual goals, may be partly responsible. Using CAPABLE could be one strategy to decrease health disparities.

We do not yet know whether health care costs will decrease for older adults participating in CAPABLE. However, because the odds of having high health care costs increase substantially with ADL difficulty,⁸ we expect that the decreased difficulties we observed will be cost-saving over time.

With different funding and a slightly different approach, a version of CAPABLE called MI-CAPABLE is being separately pilot-tested within the Michigan home and community-based services Medicaid waiver in Detroit, Flint, and Saginaw—a test funded by the Rita and Alex Hillman Foundation, with matching funds from the Michigan Medicaid program. The waiver pays for supportive services for Medicaid participants who have enough difficulty with ADLs to qualify for nursing homes but nonetheless want to live in the community. Michigan Medicaid has pledged to incorporate MI-CAPABLE into the package of waiver services for all eligible Medicaid beneficiaries in the state if the pilot test shows that it improves quality of life and delays nursing home entry.

It will be valuable to continue to examine efforts to implement CAPABLE in these and other contexts, in part to see if the improvement that we found in participants' performing ADLs and IADLs persists. Because CAPABLE's interventions are time-limited and participants continue to age, some may face the onset of new functional challenges after the program ends in its full form. We have not tested a longer time frame, but we believe that it might be useful to add monthly phone calls after five months that could trigger a home visit. For instance, in the Michigan pilot, telephone contact continues after the intervention period in the context of participants' ongoing receipt of waiver services.

The Bipartisan Policy Center highlighted CAPABLE as a program with promise to improve lives and save taxpayer money.²⁴ Various payers for health care (including a private Medicare Advantage plan, Priority Health; Medicare's Special Needs Plans for people dually eligible for Medicaid; and an accountable care organization in the Midwest) are adding CAPABLE—or considering doing so—to their member services. A

housing authority in Bath, Maine, is implementing the handyman component of CAPABLE along with one visit from an occupational therapist, while awaiting full integration of the program into a local health system. Health plans with capitated financing are well positioned to include CAPABLE, since they are able to reap the benefit from the investment.

If future analyses show that using CAPABLE delays or averts the use of nursing home care, Medicaid and the private long-term care insurance market might also consider covering CAPABLE for people who have difficulty with ADLs. The AARP Foundation is funding a systematic investigation of these and other payment possibilities such as Medicare Advantage plans, homeowner's insurance, and the self-pay market.

The National Institutes of Health (NIH) has funded a randomized controlled trial of the CAPABLE program that began in 2012 and will end in 2017, and thus was concurrent with the Innovation Center's demonstration. The intervention group receives the same CAPABLE program as described in this article. The control group participates in sedentary activities of their choice with a research assistant in the same number of home visits as the group that receives CAPABLE services. This is to control for the amount of social attention that the CAPABLE protocol provides. Results from this NIH-funded trial, including health care costs and utilization and twelve-month sustainability of results from the trial, will be available in 2018.

Conclusion

We found that use of the CAPABLE program is associated with a reduction in the disability of low-income older adults dually eligible for Medicare and Medicaid who are living in the community. This person-directed, time-limited program targets goals identified by each participant and clinicians to suit the participant's needs and environment. The program is flexible enough to be implemented in many types of systems, such as Medicaid home and community-based services waiver programs, accountable care organizations, and the self-pay market. CMS could consider making CAPABLE a benefit for dually eligible older adults. Results from a cost analysis using a matched comparison group (separate from the NIH-funded trial) will be available in 2017. ■

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