

Invited Commentary

Home Modifications to Reduce Disability in Older Adults With Functional Disability

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Functional disability, as marked by the inability to perform tasks needed to live independently, becomes increasingly common with advancing age and is strongly linked to multiple adverse health outcomes, such as depression, social isolation,

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hospitalization, nursing home placement, and death.¹ The prevalence of older people needing help in 1 or more activities of daily living (ADLs) or instrumental activities of daily living (IADLs) is approximately 30% among individuals in their 70s and more than 40% among those aged 80 years or older.² Disability and its associated adverse outcomes are even more prevalent among low-income older adults because they have more comorbidities and less access to health care and social services.³ Low-income older people are particularly vulnerable and a crucial target population for prevention and amelioration of disabilities in ADLs. In this issue of *JAMA Internal Medicine*, Szanton and colleagues⁴ address these issues. These authors report on CAPABLE, a home-based multifactorial intervention they developed that combines planned home visits by an occupational therapist and a registered nurse with environmental interventions in the home by a home modifier.

Most interventions for disability in older people have focused on physical ability (either restoring capacity or preventing decline), but the CAPABLE intervention has added a substantial innovation: making home modifications to restore physical function.⁴ This innovative strategy is necessary because declines in physical capacity are often not reversible. On the other hand, considering that disability represents a mismatch between the environment and physical capacity, we can still restore physical function by reducing environmental demands (for example, a lift chair for a person who has trouble transferring, or grab bars for a person who has difficulty showering).⁵ Such home improvements can meet the real needs of individuals with a disability and support them in living at home safely for an extended period despite a reduced physical capacity.

Szanton and colleagues⁴ showed that by offering not only a physical rehabilitation intervention but also psychological and environmental improvements, the CAPABLE program successfully reduced by 30% the ADL disabilities in 5 months (just after the conclusion of the program) among participants, compared with controls who received attention visits at home. This result was based on participants' scores on a scale (ranging from 0 to 16 points) that assessed 8 ADLs (walking across the room, bathing, upper- and lower-body dressing, eating, using the toilet, transferring in and out of bed, and grooming), with a 1-point change considered as clinically meaningful. The controls reduced the score in this scale from 3.99 (baseline) to 2.83 (5 months), but the score of the intervention group decreased

from 4.00 at baseline to 2.22 at 5 months. Despite a trend in favor of the intervention for improving IADL functioning at 5 months, the difference was not statistically significant. The CAPABLE program was also associated with other advantages, including self-reports from participants that the program made their life easier, helped them take care of themselves, and supported their living at home.

That the CAPABLE intervention was conducted in the actual environments in which the participants lived is noteworthy.⁴ Assessing older adults in their own home permits an understanding of older people's lived experience and the main barriers to their independence. Simple home modifications, such as filling in holes in floors, stabilizing shaky banisters, lowering microwaves to reachable heights, installing tailored bathroom safety equipment, and raising toilet seats, improve older persons' daily life by reducing the obstacles and physical demands of their environment, and consequently, enhancing their safety and well-being.

Many older patients with disability struggle through a siloed and uncoordinated health care system that fails to meet their complex needs and ignores their values and goals.⁶ For most of these patients, maintaining the ability to live independently at home is often the primary goal. However, the typical disease-focused model of care leads clinicians to pay insufficient attention to that goal and sometimes even to make therapeutic decisions that directly hinder that goal.⁷ Especially in frail patients with multiple chronic conditions, falls, polypharmacy, cognitive challenges, limited health literacy, and urinary incontinence are frequently the key threats to independence and well-being yet are not considered in disease-focused approaches to care.⁷ These geriatric conditions require strategies that incorporate not only the conditions' management but also low risk of iatrogeny, a minimum burden of care, and the patient's preferences.⁸ Meticulous attention to the disease list rather than the daily concerns of older patients may cause clinicians to forget asking these patients the crucial questions, such as (1) Do you have any trouble getting out of a chair or out of bed?, (2) Is getting dressed difficult for you?, and (3) Do you need help taking a bath or shower? Szanton and colleagues⁴ have incorporated such crucial elements in the CAPABLE intervention, proposing a promising model of care that may be implemented in clinical practice to help older patients with a disability live at home independently for a longer period.

Although the home modifications promoted by the CAPABLE program provide substantial patient value, they have been generally difficult to obtain because Medicare generally does not pay for services deemed nonmedical. However, the recent changes included in the CHRONIC Care Act,⁶ which give Medicare Advantage plans and accountable care organizations greater flexibility

to cover nonmedical services for identified high-need and high-risk members such as bathroom grab bars and wheelchair ramps, may make the components of the CAPABLE intervention more accessible to patients in Medicare Advantage plans and accountable care organizations.⁶ This novel initiative aims to support aging in place and seeks to reduce the increasing costs of caring for older adults with a disability.⁹ Considering the low cost of the CAPABLE intervention (US\$ 2825 per person for 5 months) compared with the costs of caring for an older person with a disability, the program requires minimal effect to be cost-effective.¹⁰ For example, delaying nursing home placement by 1 month (which would cost more than US\$ 5000) would more than make up the cost of the CAPABLE intervention.

The CAPABLE program is an excellent approach to promoting older adults' functioning and well-being in their own home, and future refinements to the intervention and evaluations should focus on several issues. First, because this randomized clinical trial showed that the benefits of CAPABLE seemed to lessen over 12 months, efforts to better sustain the gains over time are needed. In frail older patients, disability progresses over time, and environmental needs change. Periodic reassessments and refinements of the home environment will probably be required to sustain the

advantages in the long run. Second, studies that also consider cognitively impaired older adults are needed. Despite cognitive impairment being a primary cause of disability in older people, the actual format of the CAPABLE program prioritizes reducing physical demands. We also need interventions to help older patients cope with cognitive challenges and environmental modifications that can reduce cognitive demands. Finally, future research should examine other clinically meaningful outcomes (eg, caregiver burden, costs of care, hospital admissions, institutionalization, and mortality) that could confer robust results in favor of home-based multicomponent interventions.

In conclusion, Szanton and colleagues⁴ offer an innovative program to reduce disabilities in low-income older adults living in the community. The CAPABLE intervention addresses both health and environmental factors, including home repairs, related to older adults' functioning and well-being. The trial's results show that the program improved the ability of participants to live independently at home. The recent legislation that allows Medicare Advantage plans to provide extra services to older people with chronic conditions should encourage clinicians to implement interventions like CAPABLE in their clinical practice.

ARTICLE INFORMATION

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REFERENCES

1. Gill TM. Disentangling the disabling process: insights from the precipitating events project. *Gerontologist*. 2014;54(4):533-549. doi:10.1093/geront/gnu067

2. Chatterji S, Byles J, Cutler D, Seeman T, Verdes E. Health, functioning, and disability in older adults—present status and future implications. *Lancet*. 2015;385(9967):563-575.

3. Hunter EG, Kearney PJ. Occupational therapy interventions to improve performance of instrumental activities of daily living for community-dwelling older adults: a systematic review. *Am J Occup Ther*. 2018;72(4):p1, p9.

4. Szanton SL, Xue Q-L, Leff B, et al. Effect of a biobehavioral environmental approach on disability among low-income older adults: a randomized clinical trial [published online January 7, 2019]. *JAMA Intern Med*. doi:10.1001/jamainternmed.2018.6026

5. Szanton SL, Roth J, Nkimbeng M, Savage J, Klimmek R. Improving unsafe environments to support aging independence with limited resources. *Nurs Clin North Am*. 2014;49(2):133-145. doi:10.1016/j.cnur.2014.02.002

6. Tumlinson A, Burke M, Alkema G. The CHRONIC Care Act of 2018: Advancing care for adults with complex needs. The Scan Foundation. <https://www.thescanfoundation.org/sites/default/>

[files/chronic_care_act_brief_030718_final.pdf](https://www.thescanfoundation.org/sites/default/files/chronic_care_act_brief_030718_final.pdf). Accessed July 27, 2018.

7. Cassel CK. Policy for an aging society: a review of systems. *JAMA*. 2009;302(24):2701-2702. doi:10.1001/jama.2009.1901

8. Kogan AC, Wilber K, Mosqueda L. Person-centered care for older adults with chronic conditions and functional impairment: a systematic literature review. *J Am Geriatr Soc*. 2016;64(1):e1-e7. doi:10.1111/jgs.13873

9. Feinberg L, Reinhard SC, Houser A, Choula R. *Valuing the Invaluable: 2011 Update, The Growing Contributions and Costs of Family Caregiving*. Washington, DC: AARP Public Policy Institute; 2011: 32.

10. Graybill EM, McMeekin P, Wildman J. Can aging in place be cost effective? A systematic review. *PLoS One*. 2014;9(7):e102705. doi:10.1371/journal.pone.0102705