



Discussion

A call for screening for physical dysfunction in clinical practice

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1. Characteristics of ideal conditions and tests screening

Screening for health conditions remains a key tool for improving the public's health. The ideal condition to be screened for is one that is 1) common, 2) leads to a significant amount of morbidity and mortality and 3) for which an effective treatment exists to reduce harm from the condition if detected early. The ideal screening test can detect a large percentage of the disease in its preclinical state, is safe for use, is relatively inexpensive to administer and is widely available. Overall, there is an extensive literature on the psychometric properties of a number of physical performance tests for predicting future disability. In this commentary, we argue that screening for lower extremity mobility dysfunction with a single question that measures self-reported walking difficulties is an ideal condition and test for consideration by the USPSTF, based on the results of the large-scale Lifestyle Interventions and Independence for Elders (LIFE) randomized trial (Pahor et al., 2014).

2. Physical function is critical to the health of older adults

A prime objective of health care for older adults is to maintain functional independence, which aligns with surveys demonstrating that older adults are often more worried about losing their independence than they are of dying. The first and most common functional limitations, which often progress to physical disabilities, are seen in the lower extremities, including difficulty with walking on a flat surface, walking up stairs and getting out of chairs. Difficulty with walking is so essential to the health of older adults that it is a standard measure included in virtually all epidemiological studies that enroll older adults, including the National Health Interview Survey (NHIS), the Behavioral Risk Factor Surveillance System, the National Health and Nutritional Examination Survey, the Health and Retirement Study and the National Health and Aging Trends Study.

3. Brief self-report instruments of function are valid and cost-effective.

To be adopted into wide-scale clinical use, a screening must be valid and reliable and use as few resources (i.e., time, money) as possible in clinical settings. Overall, there is an extensive literature on the psychometric properties of a number of physical performance tests for predicting future disability. While the Short Physical Performance Battery (SPPB) has become the gold standard measure of physical performance, Guralnik and colleagues observed that gait speed was as useful a screening test as the entire SPPB for predicting future activities of daily living (ADL) disability (Guralnik et al., 2000).

The key weakness of these measures, however, is the amount of time they require. Though this is less of a concern if, for example, a single measure such as gait speed were used instead of the entire SPPB, a lack of time is the most frequently cited barrier to integrating health promotion and preventive services into usual care. Primary care visits average around 20 min, during which more than 5 separate concerns (e.g., depression, back pain, rash) are typically covered, leaving little time for additional topics. This time burden is compounded by financial incentives that reward a greater number of visits per provider per hour.

Concerns over a lack of time suggest that a single self-reported item that has good psychometric properties and is focused on an outcome that is responsive to treatment would be far easier to implement. A single question would take less than 30 s to ask and require no training or change to the clinic workflow, which already includes capturing patient responses to questions, such as medication reconciliation, into an electronic health record. Importantly, research repeatedly shows that innovations disseminate faster after they are simplified and their costs are reduced. For example, pressure ulcer management guidelines were successfully disseminated only after two high-impact tactics (e.g., turning patients every two hours) were selected for implementation out of a much longer list (Berwick, 2003).

Given these time concerns, we propose screening for lower extremity mobility dysfunction using self-reported walking difficulty. The NHIS,

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for example, asks “By yourself, and without using any special equipment, how difficult is it for you to walk a quarter of a mile - about 3 city blocks?”. Responses include “Not at all difficult”, “Only a little difficult”, “Somewhat difficult”, “Very difficult”, “Can’t do at all” and “Do not do this activity” (Schoenborn and Heyman, 2009).

Hardy and colleagues observed, using the NHIS measure, that 28% of older adults reported difficulty with walking three blocks and 17% reported that they were unable to do it at all (Hardy et al., 2011). After adjusting for covariates, those who reported any difficulty with walking were 1.6 times as likely to die and those reporting that they were unable to do it were 2.7 times as likely to die during follow-up (Hardy et al., 2011). Chen and colleagues, analyzing data from the LIFE Study, examined how strongly self-reported walking difficulties predict future inability to walk 400 m. The single item had a relatively low sensitivity (45%) but high specificity (95%) (Chen et al., 2018). These results were similar to those of Sayers and colleagues, who observed that self-reported difficulty in walking a quarter of a mile had a 46% sensitivity and 97% specificity for detecting concurrent inability to walk 400 m (Sayers et al., 2004). Additional research should be performed to determine the psychometric performance of self-report among broader populations than those included in these two studies

4. Walking difficulty is responsive to treatment

For a screening test to be useful, the condition that it is testing for must also be responsive to treatment. The LIFE Study observed, among 1635 adults with poor performance on the SPPB, that an exercise intervention reduced the likelihood that participants would be unable to walk 400 m at the end of the study (average 2.6 years) by 18% (30.1% in the physical activity group versus 35.5% in the control group) (Pahor et al., 2014). While systematic reviews of cohort studies have observed a strong relationship between the amount of physical activity performed and the reduced risk of future disability, the LIFE Study is the first large-scale randomized trial to demonstrate this effect.

5. Next steps

Now that strong evidence exists that physical disability can be prevented by physical activity, we believe that the time is right to consider how these results can be used to inform clinical care. While the LIFE Study used the SPPB to screen for enrollment, the time and training burdens of the SPPB coupled with the predictive validity of self-reported walking difficulties suggest that screening with self-reported walking and recommending the LIFE Study intervention for positive tests should be considered for use in clinical settings by the USPSTF. While there is often a bias against using self-report when directly observed measures exist, the high specificity of this one question suggests that when people report a problem with walking, that it is to be believed. And as positive

screening tests lead to clinical interventions, one could argue that higher specificity – from the perspective of using health care resources efficiently – may be more important than higher sensitivity.

In summary, we believe that the positive results of the large-scale LIFE Study and the strong predictive validity of a simple question measuring self-reported walking ability should be considered for use in routine clinical care by the USPSTF. Despite the challenges of implementing changes to clinical care workflow, the simplicity of this single screening question would make that final step far more likely to be successful.

6. Ethical compliance

The corresponding author warrants that if the manuscript describes research on human subjects the necessary ethical approval (or exemption) has been obtained and is on file with the authors’ institutions. For empirical research papers, add a statement of ethical compliance or exemption to the Methods section.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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