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DO THE TENETS OF LATE-LIFE DISABILITY APPLY TO MIDDLE AGE?

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The correlates, consequences and causes of disability are of fundamental concern to a U.S. population whose age structure is shifting dramatically. In 2030, the number of persons aged 65 or older is projected to be twice as high as in 2000, growing from 35 million to 74 million and representing nearly 21% of the U.S. population.(1) Regardless of the type of activity assessed, the prevalence of disability increases with advancing age and is consistently higher among women than men. Highlighting its importance, disability has been identified as a universal outcome, and older persons consistently indicate that maintaining independent function is their top priority.(2)

Although disability in older persons is often thought to be progressive or permanent, research during the past decade has shown that it is a dynamic process, with individuals moving in and out of disability over time.(3) Whether these findings apply to middle-aged persons is uncertain, but is the focus of the study by Brown and colleagues.(4) Using longitudinal data from a large, nationally representative sample of nondisabled persons aged 50 to 56 who were interviewed every two years for up to 20 years, the authors demonstrate relatively high cumulative rates of disability, with more than one out of every five persons reporting new difficulty in one or more self-care activities by the age of 64 and only a slightly lower rate for instrumental activities. Within two years of developing disability, more than a third of participants had recovered, while 10% declined further and 4% died. The rates of further decline and death were considerably higher over a 10-year period.

These findings suggest that the disabling process may be as complex in middle age as it is in late life. The rates of disability, recovery, and further decline in middle age are likely much higher than those reported in the current study for at least two reasons. First, walking and housework, two of the most commonly disabled activities, were not assessed. Second, prior research has shown that rates of disability and recovery in older persons are increasingly underestimated for assessment intervals greater than six months.(3) This occurs because most episodes of disability are relatively brief, lasting two months or less. Hence, changes in function between widely-spaced assessments will often be missed, especially when persons are asked about how they are functioning at the present time. Because attrition is usually differential, long assessment intervals for ascertaining disability are also problematic when mortality or losses to follow-up for other reasons are high, which was not the case in the current study.

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Brown et al. also identified several factors that were independently associated with new disability, most notably low income, stroke, arthritis, and obesity. Identifying risk factors from different domains suggests that disability in midlife is a multifactorial condition, similar to that in late life. These results must be interpreted carefully, however, for several reasons. First, the pool of potential risk factors did not include any objective tests of physical capacity, such as gait speed, which has consistently been shown to have the strongest association with disability. Second, the prevalence of cognitive impairment, another important risk factor for late-life disability, was very low, which could be due to the exclusion of participants with prevalent disability and the unusually low cut-point used for the Telephone Interview for Cognitive Status.⁽⁵⁾ Third, the effect of intervening illnesses or injuries was not evaluated. Increasing evidence indicates that disability in older persons arises from a combination of predisposing factors, which make one vulnerable, and intervening illnesses or injuries, which act as precipitants; and that the relative and absolute effects of the precipitants, especially hospitalizations, on disability is considerably greater than those of the predisposing factors, even when they are considered collectively.^(3, 6) Although not yet tested empirically, this model of disability likely applies as well to middle-aged persons.

Given the established hierarchy of function in older persons,⁽⁷⁾ the comparable rates of cumulative disability in self-care and instrumental activities is a bit puzzling, but could be explained, at least in part, by the absence of housework as an instrumental activity. Rates of disability are also highly sensitive to the specific wording of questions,⁽⁸⁾ offering a possible explanation for the relatively low rate of disability in bathing relative to dressing and transferring. Also, the authors operationalized disability (called functional limitations in their study) as difficulty rather than dependence. Prior research has shown that difficulty represents an intermediate level of disability between independence and dependence, defined as the need for personal assistance.⁽⁹⁾ Although it may be more susceptible to measurement error than dependence, difficulty is a useful metric for operationalizing disability, especially in younger persons, because of its higher incidence and strong associations with subsequent dependence.

Among community-living older persons, the evidence for interventions that reduce the burden of disability is strongest for physical activity.⁽¹⁰⁾ To inform the development of preventive and restorative interventions in middle-aged persons, additional research is needed to more completely elucidate the epidemiology of disability. Future studies would benefit from collection of a more comprehensive array of potential risk factors, including slow gait speed (as the best single indicator of physical frailty), shorter assessment intervals and/or improved strategies for ascertaining the occurrence of disability between widely-spaced assessments, and consideration of intervening illnesses and injuries, many of which may be amenable to prevention or improved management. Despite the absence of any direct comparisons, the similarities highlighted in the current study suggest that many of the tenets of late-life disability should be applicable to middle age.

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References

1. Federal Interagency Forum on Aging-Related Statistics. Older Americans 2016: Key Indicators of Well-Being. Washington, DC: US Government Printing Office; Aug. 2016
2. Fried TR, Tinetti ME, Iannone L, O'Leary JR, Towle V, Van Ness PH. Health outcome prioritization as a tool for decision making among older persons with multiple chronic conditions. *Arch Intern Med.* 2011; 171:1854–6. [PubMed: 21949032]
3. Gill TM. Disentangling the disabling process: insights from the Precipitating Events Project. *Gerontologist.* 2014; 54:533–49. [PubMed: 25035454]
4. Brown RT, Diaz-Ramirez LG, Boscardin WJ, Lee SJ, Steinman MA. Functional impairment and decline in middle age: a cohort study. *Ann Intern Med.* 2017 (in press).
5. Fong TG, Fearing MA, Jones RN, Shi P, Marcantonio ER, Rudolph JL, et al. Telephone interview for cognitive status: Creating a crosswalk with the Mini-Mental State Examination. *Alzheimers Dement.* 2009; 5:492–7. [PubMed: 19647495]
6. Gill TM, Gahbauer EA, Murphy TE, Han L, Allore HG. Risk factors and precipitants of long-term disability in community mobility: a cohort study of older persons. *Ann Intern Med.* 2012; 156:131–40. [PubMed: 22250144]
7. Spector WD, Fleishman JA. Combining activities of daily living with instrumental activities of daily living to measure functional disability. *J Gerontol Soc Sci.* 1998; 53B:S46–S57.
8. Wiener JM, Hanley RJ, Clark R, Van Nostrand JF. Measuring the activities of daily living: comparisons across national surveys. *J Gerontol.* 1990; 45:S229–S37. [PubMed: 2146312]
9. Gill TM, Robison JT, Tinetti ME. Difficulty and dependence: two components of the disability continuum among community-living older persons. *Ann Intern Med.* 1998; 128:96–101. [PubMed: 9441588]
10. Gill TM, Guralnik JM, Pahor M, Church T, Fielding RA, King AC, et al. Effect of structured physical activity on overall burden and transitions between states of major mobility disability in older persons: Secondary analysis of a randomized trial. *Ann Intern Med.* 2016; 165:833–40. [PubMed: 27669457]