Editorial

Mobility Performance: A High-Tech Test for Geriatricians

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Geriatricians classically spend more time with a patient during a visit and receive a lower level of reimbursement than most physicians. It has been somewhat humorously suggested that geriatrics needs the development of a G-scope—a high technology test that would provide reimbursement similar to an echocardiogram. In this issue of the Journal, Newman and colleagues (1) suggest that "walking performance is a valid indicator of physiologic reserve in older adults." Previously, Jylha and colleagues (2) found that both walking difficulty and walking speed were independent determinants of self-rated health. Abnormal mobility examination is an independent predictor of a fall (3,4). Slow walking speed is also a predictor of frailty (5), function (6), incontinence (7,8), and mortality (9). Walking is 1 of 5 items that identified persons having problems with instrumental and daily activities of daily living (10). These findings suggest that a careful, in-depth examination of gait velocity and characteristics should be an essential component of a geriatric assessment.

It has been suggested that walking speed is most strongly associated with leg strength and power rather than aerobic performance (11), with power being more important than strength (12). Lower extremity performance measures decline more rapidly than upper extremity performance, suggesting it is an excellent measure to predict functional deterioration (13). Specific physiological measures are related to the inability to walk distances (14–16). Long-distance walking (400 m) has been demonstrated to be useful to distinguish between persons at the high end of functional capacity (16). This is important as many older persons are performing their activities of daily living near their maximal capabilities (17). Thus a test that can distinguish this group from those with a high reserve level would be useful.

The causes of mobility impairment are multiple. Obviously muscle mass and strength (with strength being more important) play a major role in mobility (18–21). Alterations in muscle mass and strength are related, in part, to the decline in testosterone, Vitamin D, and growth hormone that occur with age (22–30). Older persons rely more on bone than muscle systems when stepping down, leading to a stiffer lower extremity compared with younger persons (31). Poor vascular flow to the legs can lead to impaired mobility (32). Low high-density lipoprotein cholesterol and high triglycerides are associated with impaired mobility (33). Ghosh and Aronow (34) have suggested that lipid-lowering drugs may have a role to play in the treatment of older persons with symptomatic peripheral artery disease. Alteration in bone and joint function can also lead to decreased mobility (35). The central nervous system plays an important role in mobility and fall prevention (36–40). Low cognitive performance is associated with mobility impairment (41,42). Temporal lobe atrophy, a common change seen with aging, is associated with mobility impairment (43). Another study showed that white matter, periventricular, and brain-stem lesions on magnetic resonance imaging were related to impaired motor skills (44). Cognitive demand causes an increase in postural instability in older persons (45). Alterations in psychological status can also alter mobility performance (32,38,39,44,46–48). Mobility decline represents an excellent example of how difficult it is to make a clear aging-disease dichotomy (49,50).

As has been so well documented in the pages of the Journal, an important reason to detect mobility decline early is that it is often related to a decline in physical activity (51–53). Exercise, both of the endurance and resistance types, can reverse the mobility decline (54–60). Exercise also enhances executive function and reduces brain tissue loss (61) and decreases depression (62). Thomas and colleagues (63) found that neuromuscular strength and function can be improved in persons with dementia who receive resistance-exercise training. However, some authorities have questioned whether the benefits of exercise can be maintained long term (64).

While mobility impairment can be gauged relatively simply by performing a 400-meter or 6-minute walk or the up-and-go test together with careful observation of gait, such clinical skills are poorly reimbursed. My personal preference to determine gait, balance, and mobility in my own patients is to dance with them, a totally nonreimbursable procedure! While a careful clinical history and walking a patient up two flights of stairs has similar sensitivity to an exercise stress test, cardiologists have eschewed their clinical skills in favor of high-tech, highly reimbursable testing. Highly sophisticated computerized devices for gait testing have been developed (49,65). Utilization of tests such as these may well result in our ability to enhance early detection of functional deterioration in older persons and
initiate early intervention. While geriatrics will always remain a high-touch specialty, there is a need to add high-technology touches or Kane’s (66) prophecy of geriatricians becoming chronic care doctors may become a reality. Appropriate mobility assessment represents a futuristic view of modern geriatrics whose time has come.

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REFERENCES


