An estimated 8 to 12 million Americans carry the diagnosis of peripheral arterial disease (PAD) (1,2). Their prognosis is extremely poor and is similar to that associated with many malignancies. Within 10 years of diagnosis, more than 50% of afflicted patients will have succumbed to this disorder and nearly 20% will have had a limb amputated (3,4). Importantly, the presence of PAD is frequently indicative of cerebral and coronary artery disease. Indeed, the majority of patients with PAD die from coronary heart disease (3). Lack of physical fitness, a powerful predictor of cardiovascular and all-cause mortality, may explain why individuals with PAD have such poor outcomes (5–7). In a series of important reports, McDermott et al. (5,6,8) have shown greater functional decline to be associated with patients with PAD than those without PAD. Furthermore, individuals with PAD who are typically considered “asymptomatic” are less fit than those with classic intermittent claudication, as measured by the 6-min walk test, and have less calf muscle mass and increased calf fat density (9).

In this issue of the *Journal*, McDermott et al. (10) showed that regardless of ankle brachial index, a sedentary lifestyle was associated with greater decline in functional capacity as measured by the 6-min walk test. Furthermore, slower walking speed outside the home was associated with decreased calf muscle density. The researchers build on the available data linking lack of physical activity and sedentary lifestyle with higher incidence of obesity, diabetes mellitus, morbidity, and mortality (11–14). Even more alarming is the presence of these findings among the PAD population, a group known to have poor functional capacity at baseline compared with those without PAD (15,16). Given the morbidity and mortality associated with PAD, can anything be done to improve physical fitness and prevent functional decline in these patients?

Supervised exercise programs have been shown to improve walking distance in patients with PAD. However, McDermott et al. (17) have importantly noted that most medical insurance programs do not cover this cost. Furthermore, these facilities typically operate during weekdays, when many working individuals are unable to attend. The need for transportation and the cost associated with parking are also obstacles to potential enrollment.

Home-based exercise programs represent an alternative and potentially more cost-effective means of improving physical fitness in patients with PAD (18,19). However, these programs have not been effective because of a number of individual and environmental factors. For one, presence of PAD is associated with lower socioeconomic status (SES) (20–22). Indeed, individuals with PAD from lower SES brackets are more likely to undergo amputation than those with higher SES (23). Unfortunately, individuals with lower SES reside in socioeconomically disadvantaged neighborhoods (24–26); such residences have been associated with poor physical fitness and increased cardiovascular and all-cause mortality (24,25). Socioeconomically disadvantaged neighborhoods generally lack recreational facilities, sidewalks, and parks and are less safe, factors that have been shown to influence self-sufficiency, physical activity, and body weight (27–30). Based on these limitations, simple recommendation of a home-based exercise program, without full consideration of the issues raised earlier, would be an ineffective means to improve physical fitness in patients with PAD.

Although not specifically conducted in individuals with PAD, randomized trials of behavioral modification have shown the beneficial effect of routine counseling in improving physical fitness and blood pressure (31–33). Current trends in childhood obesity and inactivity highlight an even greater need for behavioral modification at an early age (7,34,35). Despite the importance of such intervention, however, there seems to be limited experience, time, and use of this modality in routine clinical practice.

The current indication for a supervised exercise program and endovascular intervention for PAD is the presence of lifestyle-limiting claudication. However, individuals with asymptomatic PAD have significantly decreased quality of life, physical fitness, and 6-min walk distance compared with those with classic intermittent claudication (9,36). Assessment of function is an extremely important component of PAD management. The 6-min walk test, an easily measured but yet prognostically important tool, is notably underused in clinical practice.
Using it to identify individuals with PAD who are at risk of declining function may provide an opportunity to intervene early and potentially abrogate this process. The association between walking speed and calf muscle density as measured by computed tomography in this study supports the concept of a more comprehensive approach to patients with PAD. This may include endovascular therapy to alleviate symptoms and improve walking distance and speed. The MIMIC (Mild to Moderate Intermittent Claudication) trials have shown the additional benefit of balloon angioplasty to improve walking distance beyond what is achieved with supervised exercise programs alone (37). Clearly, endovascular therapy for claudication can only be viewed as a vehicle to enable a more rigorous supervised and home-based physical activity program and should never replace risk factor modification and exercise.

It is clear that improving physical fitness in patients with PAD will most likely result in lower morbidity and mortality. The current approach to intervene only upon lifestyle-limiting claudication may be inadequate in preventing functional decline. Functional testing, such as the 6-min walk test, may identify individuals who would benefit from a comprehensive, early treatment strategy. Furthermore, strategies that incorporate behavioral and environmental changes should enhance the benefit of exercise programs, risk factor modification, and revascularization. Reliance on ankle brachial index and symptomatic and asymptomatic PAD.

REFERENCES


**Key Words:** peripheral arterial disease • physical activity • physical functioning.