Passive Smoking and the 6-Minute Walk Test in Heart Failure

To the Editor:

Cahalin and colleagues (August 1996) have described the utility of the 6-min walk test (6'WT) in the evaluation of functional capacity and survival in severe (New York Heart Association class 3.3±0.6) heart failure (HF). The 6'WT predicted peak VO₂ (r=0.64) and 6-month survival, not long-term outcome. These and previous authors suggest that the 6'WT may have a role in the serial evaluation of patient status, response to therapeutic interventions, prognosis, selection of advanced treatment options, and quality of life. However, before the 6'WT is used widely for these purposes, sources of unexplained variability in this test must be determined in prospective studies.

Potential causes of variation in distance walked during the 6'WT include deconditioning, respiratory and/or cardiocirculatory disease, pain, physical immobility, and lack of motivation and/or coaching. Limited data are available regarding sources of variation and reproducibility of the 6'WT in the serial evaluation of HF patients. Remarkably, despite the prevalence and known cardiovascular effects of passive smoke (PS) and exposure to nontobacco sources of carbon monoxide (CO), none of the published studies of the 6'WT in HF have controlled for exposure to these environmental toxins.

Using the Third National Health and Nutrition Examination Survey (NHANES III) data, it is estimated that approximately 4.1 out of 4.7 million persons (57%) with HF in the United States are exposed to PS. Passive smoking may impair cardiac function and exercise capacity; adversely affect lipoproteins and endothelial cell and platelet function; promote atherogenesis; induce vascular oxidant injury and ischemic myocardial damage; and precipitate angina and arrhythmias. It has been known for more than 30 years that PS and exposure to nontobacco sources of low-level environmental CO impair exercise performance in normal smokers and nonsmokers and promote angina and cardiac arrhythmias in persons with coronary artery disease. Passive smoking is the leading cause of premature mortality in the United States, accounting for 30,000 to 60,000 cardiovascular deaths annually.

Future studies of the 6'WT or other exercise tests in HF must include objective data regarding PS and CO. Clinicians should aggressively attempt to eliminate or decrease exposure of HF patients to environmental tobacco smoke and to nontobacco sources of CO.

Stephen J. Jay, MD, FCCP
Department of Medicine
Indiana University School of Medicine
Indianapolis

References

To the Editor:

We would like to respond to the letter by Dr. Jay. The 6-min walk test (6'WT) has been employed in several recent studies of heart failure (HF) patients. The potential causes of variation in distance ambulated during the 6'WT that were mentioned by Dr. Jay are worthy of consideration. The specific effect of the level of deconditioning, respiratory or cardiocirculatory disease, and pain upon reliability of the 6'WT has never been investigated. All of these variables undoubtedly contribute to the overall performance during the 6'WT, and only recently have they been related to measures of exercise performance. Our results suggest that (1) the degree of conditioning and cardiocirculatory disease does influence the distance ambulated during the 6'WT since measures of cardiac and pulmonary performance were identified as univariate predictors of peak oxygen consumption and contributed to the prediction of peak oxygen consumption; and (2) the reliability of the 6'WT in one half of the study subjects was good (ICC=0.96). We have recently observed body pain to be a significant multivariate predictor of 6'WT distance ambulated in patients with emphysema. Jette and Downing have observed a significant inverse relationship between body pain and psychological distress in patients with cardiac disease. Although the relationship between body pain and exercise performance was not evaluated in this study, psychological factors appear to play an important role in submaximal and maximal exercise performance.

The effect of motivation upon 6'WT performance has been evaluated in patients with heart failure and lung disease and has