

A New Standard for Exercise: It is Time to Move it to Make it a High-Level Priority

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Article Text

The American Heart Association (AHA) established 2020 Impact Goals for improved ideal cardiovascular health, defined by a combination of practicing 4 health behaviors and achieving 3 health factors.¹ One of these behaviors, regular physical activity/exercise, also favorably impacts the health behavior of maintaining an ideal body mass index (BMI) and the health factors of maintaining normal levels of cholesterol, blood pressure, and blood glucose. **Thus, a case can be made that physical activity/exercise may be the most efficient tool for improving cardiovascular health,** making the recently released AHA update Statement on Exercise Standards for Testing and Training very timely.

Exercise Testing

Historically, exercise testing has been widely used as a tool to aid in the diagnosis of coronary artery disease with changes in ST-segments as the primary marker.² Although other diagnostic measures to provoke ischemia associated with stress can be utilized, **the cost-effectiveness of exercise testing suggests that it should still be selected as the first option in many cases.** This was recommended in a recent AHA Statement overviewing appropriate management of low-risk patients presenting to the emergency department with chest pain.³ The new AHA Statement on Exercise Standards for Testing and Training provides a thorough overview of expected ECG findings in normal subjects during exercise testing and ECG abnormalities that would be indicative of disease, including measures “beyond the ST-segment.” Evidence has accumulated documenting that there are a multitude of other valuable indicators that can be obtained from exercise testing. One of the most potent measures is the individuals’ cardiorespiratory fitness (CRF). Myers and colleagues⁴

demonstrated the least fit male veterans had > 4 times the risk of all-cause mortality compared to those with the highest level of CRF, and, interestingly, CRF was a stronger predictor of mortality than smoking, hypertension, high cholesterol, and type 2 diabetes. Similar findings have been observed in women, with one report showing a reduction in Framingham Risk Score--adjusted mortality risk of 17% for every 1 metabolic equivalent (MET) increase in CRF.⁵ The magnitude of the predictive value of CRF was emphasized in a recent meta-analysis using the results of 33 studies and >100,000 subjects, which demonstrated that a 1 MET increase in CRF was associated with a 15% reduction in mortality due to coronary or cardiovascular diseases.⁶ Given the established importance of CRF, the AHA recently issued a Policy Statement calling for the development of a national registry for CRF measures.⁷ Another valuable use of exercise testing, supported by a growing evidence base, is to aid in determining the prognosis of patients with a variety of different diseases and conditions. A recent Joint Statement by the European Association for Cardiovascular Prevention and Rehabilitation and the AHA provided a summary of how exercise testing responses could be used for diagnosis, prognosis, and/or therapeutic efficacy in patients with heart failure, hypertrophic cardiomyopathy, pulmonary arterial hypertension, unexplained dyspnea, and lung disease.⁸ This expanded value of an exercise test is derived from using cardiopulmonary gas exchange measurements including the ventilatory threshold, minute ventilation to carbon dioxide production (V_E/V_{CO_2}) slope, exercise oscillatory ventilation, oxygen pulse, and partial pressure of end-tidal carbon dioxide ($P_{ET}CO_2$). The increased recognition of the usefulness of cardiopulmonary gas exchange measurements led the AHA to provide a guide for developing clinical exercise testing laboratories and a guide for clinician's making and interpreting gas exchange measurements.^{9, 10} The appreciation for the importance of exercise testing has developed to the point that Arena and colleagues have proposed that the exercise test may be considered the ultimate vital sign.¹¹

Exercise Training

Although exercise has long been associated with good health, it was only 20 years ago that lack of sufficient physical activity/exercise was considered a major risk factor of equal importance as high cholesterol, high blood pressure, and smoking.¹² The accumulated evidence led to the first public health statement in 1995 and the 1996 Surgeon General's report on physical activity and health.^{13, 14} As the evidence base for the health benefits continued to expand, updated recommendations were issued by the American College of Sports Medicine and AHA in 2007 and the first ever federal guidelines on physical activity in 2008.¹⁵⁻¹⁷ Likewise, there are clear recommendations of the importance of exercise for secondary prevention of coronary and cardiovascular diseases.¹⁸ These reports document that sufficient amounts of physical activity/exercise are beneficial in the prevention and/or treatment of many chronic diseases. Despite the well accepted benefits, surveillance data from 2005 showed a majority of U.S. adults (53.3% of women and 50.3% of men) do not obtain sufficient physical activity for health-enhancement (defined as > 30 minutes at a moderate-intensity on most

days of the week).¹⁹ Similar low rates of patient referral and participation in cardiac rehabilitation programs have been reported and led to calls for action.²⁰ ²¹ The physical activity guidelines for Americans suggests a socio-ecologic approach that includes action at all levels (personal, interpersonal, organizational, community, and public policy) of society.¹⁷ One approach to encourage individuals to be physically active regularly is to have physicians routinely discuss this with their patients. This approach has been shown to be effective in Sweden, which developed a program called Physical Activity on Prescription.²² The American College of Sports Medicine has also initiated a campaign called Exercise is Medicine, with a major recommendation of assessing exercise habits as a vital sign.²³

2013 Exercise Standards

The working group for this new AHA statement, chaired by Dr. Gerald Fletcher, took on a tremendous challenge to synthesize the wealth of recent research available on this topic. The vastness of this task is noted by the increase in the number of references cited from 293 in the 2001 report to more than 600 in the 2013 statement. Although there have been numerous scientific reviews and guideline statements issued related to exercise, the value of the new AHA statement is in consolidating all of this information into one up-to-date document. This new Statement provides a concise summary of the purposes, procedures, and interpretation of exercise testing. Additionally, the new AHA statement provides an overview of the medical benefits of exercise training and states *“exercise can be viewed as a preventative medical treatment, ‘like a pill’ that should be taken on an almost daily basis.”* A recent commentary in the Lancet advocated that the *“prescription of physical activity should be placed on a par with drug prescription.”*²⁴ The new AHA statement outlines clear standards to follow related to pre-exercise participation screening and for providing specific recommendations to guide a safe and effective progression of exercise training. So the time is now for increased use of both exercise testing and exercise training. The new Statement lists the following as common uses of exercise testing:

- Detection of coronary artery disease (CAD) in patients with chest pain [chest discomfort] syndromes or potential symptom equivalents,
- Evaluation of the anatomical and functional severity of CAD,
- Prediction of cardiovascular events and all-cause mortality,
- Evaluation of physical capacity and effort tolerance,
- Evaluation of exercise-related symptoms,
- Assessment of chronotropic competence, arrhythmias, and response to implanted device therapy, and
- Assessment of the response to medical interventions.

Given the financial challenges present in healthcare today, the cost-effectiveness of exercise tests, which have a wide spectrum of use, makes it a procedure that should receive high priority. Likewise, exercise training may provide the most bang for the healthcare buck. So from both a medical and financial perspective, exercise testing and training are of key importance for improved cardiovascular

health. We can all benefit by reviewing this updated AHA statement and applying the information in our work.

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