Importance of Assessing Cardiorespiratory Fitness in Clinical Practice: A Case for Fitness as a Clinical Vital Sign

A Scientific Statement From the American Heart Association

ABSTRACT: Mounting evidence has firmly established that low levels of cardiorespiratory fitness (CRF) are associated with a high risk of cardiovascular disease, all-cause mortality, and mortality rates attributable to various cancers. A growing body of epidemiological and clinical evidence demonstrates not only that CRF is a potentially stronger predictor of mortality than established risk factors such as smoking, hypertension, high cholesterol, and type 2 diabetes mellitus, but that the addition of CRF to traditional risk factors significantly improves the reclassification of risk for adverse outcomes. The purpose of this statement is to review current knowledge related to the association between CRF and health outcomes, increase awareness of the added value of CRF to improve risk prediction, and suggest future directions in research. Although the statement is not intended to be a comprehensive review, critical references that address important advances in the field are highlighted. The underlying premise of this statement is that the addition of CRF for risk classification presents health professionals with unique opportunities to improve patient management and to encourage lifestyle-based strategies designed to reduce cardiovascular risk. These opportunities must be realized to optimize the prevention and treatment of cardiovascular disease and hence meet the American Heart Association's 2020 goals.

Mounting evidence over the past 3 decades has firmly established that low levels of cardiorespiratory fitness (CRF) are associated with a high risk of cardiovascular disease (CVD) and all-cause mortality, as well as mortality rates attributable to various cancers, especially of the breast and colon/digestive tract.1–4 Importantly, improvements in CRF are associated with reduced mortality risk.5 Although CRF is now recognized as an important marker of cardiovascular health, it is currently the only major risk factor not routinely assessed in clinical practice.

In 2013, the American Heart Association and the American College of Cardiology jointly released new guidelines for the prevention and treatment of coronary artery disease.6 Although CRF is the fourth-leading risk factor for CVD and has long been established as a significant prognostic marker,7 it was excluded from the risk calculator. The authors of the guidelines noted that the evidence that CRF would enhance risk classification was inconclusive, and thus, the added contribution of CRF to determine CVD risk was uncertain. There is, however, a large body of epidemiological and clinical evidence demonstrating not only that CRF is a potentially stronger predictor of mortality than established risk factors such as smoking, hypertension, high cholesterol, and type 2 diabetes mellitus (T2DM), but that the addition of CRF to traditional risk factors significantly improves the reclassification of risk for adverse outcomes.

Key Words: AHA Scientific Statements ■ cardiovascular disease ■ physical fitness ■ risk factors

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Indeed, numerous epidemiological studies have now demonstrated that more than half the reduction in all-cause and CVD mortality generally occurs when moving from the least fit group to the next least fit group. For many people, this can be achieved by routine, moderate-intensity exercise consistent with consensus guidelines; lower levels of physical activity may be all that is needed to derive a clinically significant benefit in habitually sedentary individuals. This has implications for physical activity counselling, given that considerable benefits are likely to occur by encouraging the most sedentary or low-fit individuals to engage in modest amounts of physical activity accumulated throughout the day. Although gaps in knowledge remain, and refinement of CRF targets for risk reduction across age and sex need further investigation, the evidence reviewed suggests that the measurement of CRF improves patient management and that its omission from routine clinical practice for the vast majority of patients is unacceptable. Accordingly, the inclusion of CRF measurement or estimation in routine practice affords clinicians with a vitally important opportunity to improve patient management and, more importantly, patient health.

**FOOTNOTES**

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This statement was approved by the American Heart Association Science Advisory and Coordinating Committee on June 28, 2016, and the American Heart Association Executive Committee on July 20, 2016. A copy of the document is available at http://professional.heart.org/statements by using either “Search for Guidelines & Statements” or the “Browse by Topic” area. To purchase additional reprints, call 843-216-2533 or e-mail kelle.ramsay@wolterskluwer.com.


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