

## Top Ten Things to Know Importance of Assessing Cardiorespiratory Fitness in Clinical Practice: A Case for Fitness as a Clinical Vital Sign

1. Cardiorespiratory fitness (CRF) is a reflection of overall physiological health and function, especially the cardiovascular system. Many factors can contribute to CRF including gender, age, race or ethnicity, and genetics. Regular physical activity is a behavior that can contribute to improved CRF.<sup>1</sup>
2. CRF is an independent marker of risk for cardiovascular (CV) and all-cause mortality. It is a stronger predictor of mortality than established risk factors such as cigarette smoking, hypertension, high cholesterol, and type 2 diabetes.
3. CRF can be expressed in several ways, including metabolic equivalents (METs). Lower CRF in adults (<5 METs) is associated with higher risk for CV mortality; whereas CRF levels >8 to 10 METs are associated with increased survival. More than half of the reduction in all-cause mortality occurs between the least fit group (CRF <5 METs) and the next least fit (CRF 5-7 METs), suggesting that individuals don't have to become elite athletes to benefit from increased CRF. Small increases in CRF are associated with considerably (10-30%) lower adverse CV event rates.
4. This Scientific Statement reviews the currently available data linking cardiorespiratory fitness to cardiovascular and overall health and establishes the foundation to incorporate cardiorespiratory fitness measurements in standard clinical practice.
5. In addition to the improved cardiovascular outcomes, higher levels of CRF are associated with improved outcomes for certain forms of cancer, surgical risk, dementia and Alzheimer's disease, depression, type 2 diabetes, and metabolic syndrome.
6. The potential mechanisms for the independent inverse association are not yet fully understood, however the benefits of improving CRF are greatest for those at the lowest CRF suggesting that some physical activity is better than none – especially for habitually sedentary individuals.
7. Increasing CRF by even 1 MET is associated with a 10% - 20% decrease in mortality rates. To decrease CV risk, physical activity regimens should be implemented with an initial target of increasing CRF ≥10%.
8. While both high intensity interval training (HIT) and moderate intensity continuous training (MICT) can be effective for increasing CRF, results across studies are inconsistent when comparing the effects of HIT and MICT on increasing CRF. Although HIT may be as safe as MICT for patients with CVD, more data are needed.
9. Cardiopulmonary exercise testing (CPX) is considered the gold standard for assessing exercise capacity, however other methods are available to estimate CRF including submaximal exercise test protocols, the 6-minute walking test (6MWT), and non-exercise prediction equations. These alternative methods have less precision than CPX testing, but may be more readily-available in certain clinical situations. Care should always be taken to select a protocol that matches an individual's exercise and functional capacity.
10. Adding CRF metrics to 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 will help optimize the prevention and treatment of CVD and hence, meet the AHA 2020 goals.

Ross R, Blair SN, Arena R, Church TS, Despres J-P, Franklin BA, Haskell WL, Kaminsky LA, Levine BD, Lavie CJ, Myers J, Niebauer J, Sallis R, Sawada SS, Sui X, Wisloff U; on behalf of the American Heart Association Physical Activity Committee of the Council on Lifestyle and Cardiometabolic Health; Council on Clinical Cardiology; Council on Epidemiology and Prevention; Council on Cardiovascular and Stroke Nursing; Council on Functional Genomics and Translational Biology; and Stroke Council. [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](#) [published online ahead of print November 21, 2016]. *Circulation*. doi: 10.1161/CIR.0000000000000461.

<sup>1</sup> Kaminsky (2013) The importance of cardiorespiratory fitness in the United States: the need for a national registry: a policy statement from the American Heart Association. *Circulation*. 2013 Feb 5;127(5):652-62. doi: 10.1161/CIR.0b013e31827ee100.