

Better cardiorespiratory fitness related to lower risk of death, cardiovascular disease

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Persons with higher levels of cardiorespiratory fitness have a lower risk of all-cause death and coronary heart disease and cardiovascular disease compared to persons with lower levels of cardiorespiratory fitness, according to an analysis of previous studies appearing in the May 20 issue of *JAMA*.

Physical fitness is typically expressed as cardiorespiratory fitness (CRF) and is assessed by exercise tolerance testing; however, it is rare for clinicians to consider CRF when evaluating future risk of [coronary heart disease](#) (CHD). "A major reason for lack of consideration of CRF as a marker of CHD risk may be that the quantitative association of CRF for cardiovascular risk is not well established. The degree of risk reduction associated with each incremental higher level of CRF, the criteria for low CRF, and the magnitude of risk associated with low CRF have been inconsistent among studies," the authors write.

Satoru Kodama, M.D., Ph.D., of the University of Tsukuba Institute of Clinical Medicine, Ibaraki, Japan, and colleagues conducted a meta-analysis to systematically review the quantitative relationship between CRF and all-cause mortality and CHD or cardiovascular disease (CVD) events in healthy individuals. The researchers identified 33 studies for inclusion in the analysis, which included: all-cause mortality, 102,980 participants and 6,910 cases; CHD/CVD, 84,323 participants and 4,485 cases.

CRF was estimated as maximal aerobic capacity (MAC) expressed in

metabolic equivalent (MET; measured via [oxygen consumption](#)) units. Participants were categorized as low CRF (less than 7.9 METs), intermediate CRF (7.9 - 10.8 METs), or high CRF (10.9 METs or greater).

Compared with participants with high CRF, those with low CRF had a 70 percent higher risk for all-cause death and a 56 percent higher risk for CHD/CVD events. Compared with participants with intermediate CRF, those with low CRF had a 40 percent higher risk for all-cause death and a 47 percent increased risk for CHD/CVD events.

"These analyses suggest that a minimal CRF of 7.9 METs may be important for significant prevention of all-cause mortality and CHD/CVD," the researchers write. They add that expressed in terms of walking speed, men around 50 years of age must be capable of continuous walking at a speed of 4 m.p.h. and women, 3 m.p.h.

"It is possible that consideration of low CRF as a major coronary risk factor could be put into practical use in the clinical setting through identification of low exercise tolerance by exercise stress testing or in daily life by the speed at which a person can walk before experiencing exhaustion," the researchers write.

The analysis also indicated that a 1-MET higher level of MAC (corresponding to 0.6 mile/hour higher running/jogging speed) was associated with a decrease of 13 percent in risk of all-cause mortality, and a 15 percent decrease in risk of CHD/CVD.

"Based on the findings of our meta-analysis, we suggest for future research (1) further development of a CHD prediction algorithm (e.g., Framingham Scores) that would consider both CRF and the classical coronary risk factors to allow physicians to use CRF as a major risk factor in clinical settings; (2) cost-effectiveness of exercise testing for

assessing CRF from the viewpoint of primary prevention of all-cause mortality and CHD; and (3) a clinical trial to determine whether an intervention that improves CRF by exercise reduces the risk of all-cause mortality and CHD," the authors write.

More information: *JAMA*. 2009;301[19]:2024-2035.

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