CARDIORESPIRATORY FITNESS (CRF) A VITAL SIGN FOR HEALTH

CRF refers to the ability of the circulatory and respiratory systems to supply oxygen during sustained physical activity

CRF has been shown to be a strong and independent risk factor for cardiovascular disease (CVD) and all-cause mortality, for the healthy and individuals with disease, independent of existing cardiovascular disease or the presence of chronic disease and/or other CVD risk factors¹.

Improvements in CRF are associated with reduced all-cause mortality risk, regardless of changes in BMI and body fat².





CARDIOVASCULAR HEALTH OUTCOMES

- CRF is a stronger predictor of mortality than established risk factors¹.
- individuals with CVD had the same relative risk of death as those without CVD when their CRF level was >10.7 MET^{*3}.
- Women with a CRF level of < 35 ml O₂.kg⁻¹.min⁻¹ and men with a level of < 44.2ml.kg⁻¹.min⁻¹ were 5 & 8 x more likely to have a cluster of cardiovascular risk factors, respectively¹



BRAIN AND IMMUNITY

DIABETES AND HYPERTENSION

- 44% decrease in all-cause mortality among people with diabetes when increasing CRF by 22% ¹
- Increasing CRF lowers the mortality risk in people with diabetes irrespective of age⁴
- An inverse association has been found between CRF and the risk of developing metabolic syndrome and type 2 diabetes²
- CRF has been shown to be the strongest factor associated with survival in patients with hypertension⁵



THE NUMBERS

- **59%** reduction in death rate in healthy men and women when improving CRF level from low to
- Higher levels of CRF are associated with a reduced risk of developing both dementia and Alzheimer's disease²
- Higher levels of CRF are associated with lower measures of anxiety and symptoms of depression²
- CRF has the potential to be used as a clinically relevant triage tool during the COVID-19 outbreak⁶

moderate⁷

- 63.6% reduction in death risk among diabetes when CRF improved from < 8.8 MET to 8.8– 10.1 MET^{*8}
- 70-80% higher risk of individual with low CRF for all-cause mortalitycompared to CRF fit individuals^{5,9}
 - **4x** increased risk of all cause mortality with the least fit (<6 METS), healthy and individuals with CVD³



THE NUMBERS PER MET*

- 8 14 % survival benefit in post myocardial infarction men, PER 1 MET increase in CRF¹⁰
 - **10 25%** improvement in survival rate per 1 MET increase in CRF²
 - 21-30 % decrease in risk of

OPTIMAL LEVELS FOR CRF (IN METS)⁵

Age (years)	METS
Women	
18-19	11.1-12.9
20-29	10-11.4
30-39	9.4-10.8
40-49	9.0-10.3
50-59	8.1-9.9
60-69	7.0-8.4
70-79	6.0-6.9
>80	5.5-6.2
<u>Men</u>	
18-19	13.0-13.9
20-29	12.0-13.6
30-39	11.2-12.9
40-49	11.0-12.4
50-59	10.0-11.3
60-69	8.5-9.9
70-79	7.0-8.4
>80	6.3-7.2

premature CVD and all-cause mortality PER 1 MET increase in CRF^{5,11}

 2 -5 X higher CVD & all-cause death rate with a 2 – 3 MET decrease in CRF¹

Increase your physical activity level to achieve the optimal CRF. CRF is responsive to therapy and thus serial measures of this variable are valuable. An improvement in CRF will be associated with a decreased risk of adverse health outcomes.

<u>References:</u>

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*The Metabolic Equivalent of Task [MET] is a physiological measure expressing the energy cost of various physical activities by the amount of oxygen uptake, circulation and utilization needed at the muscle level to perform work at a certain level of physical activity, compared to the energy expended by an individual while seated at rest (1 MET ~ 3.5 ml O2.kg-1.min-1). Dr G. Torres

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