

Prediction of cardiovascular health by non-exercise estimated cardiorespiratory fitness

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Objective: To estimate the incidence of major biological cardiovascular disease (CVD) risk factors in adults using non-exercise estimated cardiorespiratory fitness (eCRF). **Methods:** 200 039 healthy people (99 957 women), aged ≥ 18 years (38.5 ± 12.1 years) from the Taiwan MJ Cohort. eCRF was estimated with validated algorithms. Biological CVD risk factors, including hypertension (HTN), hypercholesterolemia, atherogenic dyslipidaemia, type 2 diabetes mellitus (T2DM) and systemic inflammation, were assessed by standardised physical examinations and laboratory tests. **Results:** In a basic model, baseline eCRF was inversely associated with the incidence of each CVD risk factor in both men and women (HR per 1 metabolic equivalent (MET) increase in eCRF ranged from 0.53 for T2DM in women to 0.96 for hypercholesterolemia in women). In full adjusted models, the associations were attenuated but remained statistically significant, with the exception of hypercholesterolemia in women. In a subcohort of 116 313 individuals with two repeated exposure measurements, an increase in eCRF was associated in both sexes with a subsequent lower incidence of CVD risk factors (HR per 1-MET increase ranged from 0.58 to 0.91 in models adjusted for age, year of examination and baseline eCRF). Comparisons of predictive performance showed that the addition of eCRF to values of traditional CVD risk factors had relevant improvements in risk

discrimination (C-index increased from 0.1% to 3.2%), mainly for HTN and T2DM risk prediction.

Conclusions: eCRF and its changes predict the incidence of biological CVD risk factors, especially HTN and T2DM. Routine assessment of eCRF in clinical settings is technically feasible and might be useful for CVD prevention. © 2020 Author(s) (or their employer(s)). No commercial re-use. See rights and permissions. Published by BMJ.

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