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QUANTIFYING THE ASSOCIATION BETWEEN PHYSICAL ACTIVITY AND CARDIOVASCULAR DISEASE: A META-ANALYSIS

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Background and objective: The relationships between physical activity (PA) and cardiovascular disease (CVD) have predominantly been estimated using categorical measures of PA. In this systematic review and meta-analysis we derive a single continuous physical activity metric to directly compare the association between activity and CVD, both before and after adjustment for a measure of body weight.

Data sources: A systematic review was conducted through searching electronic databases such as MEDLINE and EMBASE for studies published between 1981 and 2014.

Study eligibility criteria and participants: Prospective cohort studies were included that measured PA levels where at least two of the following domains were measured: leisure, active travel and occupational activity. The relative risk needed to have been reported in healthy individuals and been adjusted for a measure of body weight. The PA exposure in each study was converted to MET hours per day. Various transformations were explored to parametrically describe the dose-response relationships, as well as a non-parametric categorical approach.

Results: A total of thirty-six studies were included in the analysis. An increase from inactive to achievement of recommended PA levels 150 minutes of moderate-intensity aerobic activity reduced the risk of CVD mortality by 23% and CVD incidence by 17% (RR 0.77 (0.71-0.84) and (RR 0.83 (0.77-0.89) respectively, after adjustment for body weight. Overall, there were a total of 3,439,874 participants, with 179,393 events occurring during an average follow up period of 12.3 years.

Conclusions: and implications: A single continuous metric for PA levels allowed us to directly compare the effect of physical activity on CVD incidence and mortality including myocardial infarct (MI), coronary heart disease (CHD) and heart failure. Effect sizes suggested that the greatest gain in health is associated with moving from inactive to small amounts of physical activity.