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EDITORIALS

Every step you take

Walk more and sit less: even light exercise is linked to a lower risk of death

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In the 1950s the London busman's study found that bus drivers developed a higher rate of coronary heart disease than their bus conductor counterparts.[1] Since then, observational studies have repeatedly suggested that sedentary behaviour is bad and physical activity is good for health and longevity. Guidelines recommend at least 150 minutes of moderate intensity or 75 minutes of vigorous intensity aerobic physical activity each week.[2 3]

Guideline evidence is mostly based on self report of the amount, intensity, and frequency of activity. Self report is, however, open to recall and reporting bias, potentially resulting in underestimation of low intensity activity and overestimation of overall activity.[4] Self reports are also imprecise. Exactly how much activity (and at what intensity) is needed to protect health remains unclear. In addition, sedentary behaviour is emerging as a potentially independent risk factor for adverse health outcomes[5] despite inconsistency in ascertainment of sedentary time.[6]

The introduction of body-worn sensors in the past decade has enabled more objective and precise data on the amount and intensity of physical activity and considerably advanced the specialty. But inconsistency and uncertainty remain, especially about the magnitude of any effects and the contribution to health of low levels of physical activity.

The systematic review and meta-analysis by Ekelund and colleagues (doi:10.1136/bmj.l4570) combines high quality studies analysing the effect of sensor measured physical activity and sedentary behaviour on mortality.[7] By harmonising the methods and considering more than 36 000 people, 240 000 person years of follow-up, and more than 2100 events, the authors were able to differentiate between different levels of intensity—including low intensity physical activity—with sufficient statistical power.

The results show non-linear dose-response relations between all activity measures, including sedentary time, and all cause mortality in adults. More than 9.5 hours of daily sedentary behaviour, excluding sleeping time, was associated with a statistically significant increased risk of death. In contrast, mortality fell steeply as total volume of physical activity increased up to a plateau at 300 accelerometer counts per minute of wear time. A similarly steep decrease in mortality occurred with increasing duration of light physical activity up to a plateau of about 300 minutes per day.

The new meta-analysis clarifies previous findings and confirms that even light activity, such as walking, is beneficial. The observed effect sizes for physical activity and mortality were substantially larger than those reported previously, potentially because of the improved precision of measurement and reduction of variance.

Questions remain, particularly over whether the effect of physical activity continues above a certain threshold. Previous studies using step detection to quantify activity have also reported a plateau after an initially steep decrease in mortality.[8 9] Furthermore, it is unclear whether the effect of activity simply adds up or whether the distribution and complexity of activity across the day or week is relevant. We do not know if sedentary behaviour and physical activity are independent factors or if they represent two sides of the same coin. New statistical approaches such as compositional analyses are required to explore these interdependencies.[10]

The current analysis assumes that physical activity levels remain constant over time, which does not reflect reality. Changes in the duration and intensity of physical activity occur over the whole life span. Longitudinal data and novel methods examining activity trajectories are needed. This is also important to eliminate the risk of reverse causation whereby disease causes reduced activity, not the other way around.

Every step counts

Besides these details, the clinical message for general practitioners, public health professionals, policy makers, and the public seems straightforward: every step counts and even light activity is beneficial. Developing ways to limit sedentary time and increase activity at any level could considerably improve health and reduce mortality.

Effective interventions include prescriptions for activity from primary care practitioners, particularly with community follow-up.[11] Health coaches also show promise.[12] Activity

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prescribing is cheaper than many pharmaceutical interventions for cardiovascular disease and more effective at improving quality adjusted life years.[13]

Increasing activity at the population level is challenging, and sustained behaviour change is the holy grail of primary care and public health.[14] Walking is one promising target for intervention.[15] It is simple, affordable (free), achievable even for older adults, and rarely contraindicated.

In conclusion, Ekelund and colleagues' findings are important and easy to interpret: we should all move more and sit less and should encourage others to do the same.

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