

No Pain, No Gain: Not True

Stofan JR, DiPietro L, Davis D, Kohl HW 3rd, Blair SN. Physical activity patterns associated with cardiorespiratory fitness and reduced mortality: the Aerobics Center Longitudinal Study. *Am J Public Health* 1998;88:1807-13.

Study Overview

Objective. To examine the physical activity patterns associated with low, moderate, and high levels of cardiorespiratory fitness.

Design. Population-based, cross-sectional study using data obtained from medical examination and patient questionnaires.

Setting and participants. 13,444 men and 3972 women between 20 and 87 years of age who had undergone at least 1 comprehensive medical examination between 1987 and 1993 at the Cooper Clinic, Dallas, TX. Patients with known chronic disease (determined by personal history of myocardial infarction, hypertension, stroke, or diabetes or abnormalities on either a resting or exercise electrocardiogram) were excluded.

Methods. Participants were categorized as inactive, regularly active, or irregularly active based on their self-reported activity patterns. Cardiorespiratory fitness was assessed by performance on a maximal exercise test. Participants were assigned to 1 of 5 fitness quintiles based on the sex- and age-specific distribution of maximal treadmill time in the study population. The quintiles were combined to form 3 fitness levels: low (quintile 1), moderate (quintiles 2 and 3), and high (quintiles 4 and 5).

Main measures. Estimated energy expenditure (kcalories per week) and volume of reported activities (minutes per week) among individuals at low, moderate, and high fitness levels.

Main results. Thirty-three percent of men and 28% of women were classified as regularly active, 34% of men and 37% of women were irregularly active, and 33% of men and 35% of women were inactive. Levels of fitness increased with prevalence of exercise activities (eg, walking, jogging, stationary cycling, treadmill exercise, and aerobic dance). Average weekly leisure-time energy expenditures of 525 to 1650 kcalories for men and 420 to 1260 kcalories for women were associated with moderate to high levels of cardiorespiratory fitness. Men in the moderate and high fitness categories walked between 130 and 138 minutes per week, and women in these categories walked between 148 and 167 minutes per

week. Body mass index was inversely associated with relative fitness for both men and women ($P < 0.05$).

Conclusion

Moderate to high levels of fitness can be achieved with relatively modest levels of physical activity, such as walking briskly for approximately 30 minutes on most days of the week.

Commentary

A large body of medical literature documents the relationship between higher levels of cardiorespiratory fitness and lower levels of chronic disease morbidity and mortality [1-3]. In addition, studies have shown that improvements in fitness are associated with reductions in morbidity and mortality [4,5]. The authors' findings suggest that most individuals should be able to achieve a moderate level of fitness and, as a result, substantially reduce their mortality risk.

Applications for Clinical Practice

The American College of Sports Medicine, the U.S. Centers for Disease Control and Prevention [6], and others recommend that all adults engage in moderate physical activity on most, if not all, days for 30 minutes or more. This study suggests that somewhat lower levels of physical activity can improve one's fitness level sufficiently to produce substantial health benefits. Physicians, managed care decision makers, and other health providers who encourage their patients and members to exercise should be confident in the beneficial effects of their efforts.

References

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"Outcomes Research in Review" is edited by Chris L. Pashos, PhD, Executive Director of Pharmacoeconomics and Outcomes Research, Abt Associates Clinical Trials, Cambridge, MA, and Associate Editor, Health Policy, Journal of Clinical Outcomes Management. Dr. Pashos selects, summarizes, and provides the commentary on the studies that appear in this section.

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