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## Using Physical Activity to Gain the Most Public Health Bang for the Buck

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**The overall health benefits** of physical activity have been known for several decades. It is clear that consistent participation in physical activity leads to large physiologic adaptations that are closely connected to improved cardiorespiratory, vascular, musculoskeletal, mental, and metabolic health. These effects are pervasive across the lifespan. In fact, there is no single medication treatment that can influence as many organ systems in a positive manner as can physical activity. These findings have led several health organizations to publish guidelines for the conduct of a recommended amount and intensity of physical activity (eg, American Heart Association, The Obesity Society). These various recommendations culminated in 2008 when the US Department of Health and Human Services published the first Physical Activity Guidelines for Americans (<http://www.health.gov/paguidelines/guidelines/>). The guidelines state that “...some physical activity is better than none, and adults who participate in any amount of physical activity gain some health benefits”<sup>1</sup>(p7) and that “For substantial health benefits, adults should do at least 150 minutes (2 hours and 30 minutes) a week of moderate-intensity, or 75 minutes (1 hour and 15 minutes) a week of vigorous-intensity aerobic physical activity....”<sup>1</sup>(p7) Adults should perform aerobic activity in bouts of at least 10 minutes spread throughout the week. The recommendations state that although there have been a few reports of heart complications due to very high levels of activity, additional health benefits can be gained with higher doses of physical activity beyond the recommended amount.

Although there is substantial evidence to support the recommendations that are extensively outlined by the Physical Activity Guidelines Steering Committee, there was not a direct comparison of the dose-response relationship between physical activity and health outcomes. Arem and colleagues<sup>2</sup> are among the first to provide such a direct comparison by examining mortality outcomes over 14.2 years in a population-based sample of 661 137 men and women. Questions about physical activity focused on those performed during leisure including walking, jogging or running, swimming, tennis or racquetball, bicycling, aerobics, dance, and other strenuous activities. The questions were harmonized across the 6 large cohorts by calculating metabolic equivalent hours per week: a convenient approach to capture both the intensity and duration of activity. Consistent with the plethora of existing evidence, the results clearly demonstrate that leisure time physical activity is associated with reduced mortality risk with similar effects seen in cancer- and cardiovascular disease-related

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mortality. There is some important new knowledge. First, the mortality risk reduction tapers strikingly after reaching 3 times the minimum leisure time physical activity. Second, individuals performing moderate-intensity activity at 2 times the minimum amount had the same benefit as those performing 10 times the recommended level. Vigorous activity also provided a benefit, but it was similar to activity done at a moderate intensity and the effect of vigorous activity waned after achieving a 20% mortality rate reduction in individuals meeting the minimum requirement. Lastly, individuals performing very high levels of activity—more than 10 times the recommended minimum—did not have an elevated risk of mortality. These findings varied little across different demographic and health-related factors (ie, age, sex, race, obesity, smoking, and history of heart disease or cancer). The results of the study are not applicable to the US population as a whole because the cohorts were largely white (approximately 95%). The results are also not applicable to the many other noted health benefits of physical activity, such as mental health, metabolic conditions, and maintaining an appropriate energy balance.

The findings of the present study<sup>2</sup> generally support the 2008 Physical Activity Guidelines' minimum requirement of moderate-intensity physical activity to reach reductions in mortality. However, what is critical about this analysis is not the mortality reduction in individuals who had met some level of the physical activity recommendation; rather, it is the reference group. This group of 52 848 individuals, comprising only 8% of the total sample, drove most of the associations, meaning that a lot of the mortality reductions were seen in people only one step away from doing no leisure time physical activity. Compared with more active groups, members of the reference group were more likely to be younger than 60 years, have a higher rate of smoking and obesity, and have less than a college education. Practitioners have a unique opportunity to influence this reference group since they are the most likely to receive benefit even with a small amount of physical activity. However, adherence to a specific level of physical activity is a complicated phenomenon that is influenced by a variety of personal and social factors that partly consist of environmental barriers and exercise self-efficacy.<sup>3,4</sup> Essentially, the major barriers continue to be motivation, time, access to facilities or equipment, energy, having a workout partner, and exercise self-efficacy. Unfortunately, a practitioner is unable to remove all these barriers. Despite the complexity associated with adherence to physical activity, evidence<sup>5</sup> suggests that physicians in particular can influence patient behavior through counseling. In addition, almost 90% of primary care physicians believe they are competent to counsel their patients, yet only approximately half of physicians felt they could motivate patients to change their behavior.<sup>6</sup> The fact that only approximately one-third of adults received counseling from a physician or other health professional is disappointing, although this rate has improved by 40% from 2000 to 2010.<sup>7</sup> A goal for Healthy People 2020 is to increase the rate of physician counseling or education related to physical activity. Physicians who seek out the segment of the population that performs no leisure time physical activity could receive the most payback in their patient's health.

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