Physical Activity for Health—Every Minute Counts

Public health guidelines for physical activity provide evidence-based recommendations for the amount, intensity, and types of physical activity that should be undertaken to obtain and maintain health benefits. The Physical Activity Guidelines for Americans, 2nd Edition, recommend participation in moderate- and vigorous-intensity aerobic activity and muscle-strengthening activities throughout the week. These recommendations are especially important for the estimated 76% of US residents who are not currently meeting the physical activity guidelines for aerobic and muscle-strengthening activity.

One important component of the current guidelines for adults is that for substantial health benefits, engagement in 150 to 300 minutes a week of moderate-intensity aerobic physical activity, or 75 to 150 minutes a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity is recommended. However, these ranges are couched within other recommendations that indicate that additional health benefits can be gained by engaging in physical activity beyond the equivalent of 300 minutes of moderate-intensity physical activity a week. More importantly, the first bullet for adults in the Physical Activity Guidelines for Americans, 2nd Edition, indicates that adults should move more and sit less throughout the day, and that some activity is better than none because adults who sit less and do any amount of moderate to vigorous physical activity (MVPA) gain some health benefits. Thus, an important takeaway from the guidelines is that a range of health benefits can be obtained across the entire continuum of physical activity. And while attaining between 150 and 300 minutes per week (21 to 43 minutes per day) of moderate activity is the sweet spot that balances engagement in optimizing health benefits, health benefits can be obtained at lower levels of activity. This is especially important for older adults and adults with chronic conditions or disabilities. While the key guidelines apply across the spectrum of adulthood, older adults and those with chronic conditions or disabilities also realize numerous health benefits and should be as physically active as their abilities and conditions allow, and they should avoid inactivity.

These concepts are derived from the 2018 Physical Activity Guidelines Advisory Committee Scientific Report, which is emphatic that the health benefits associated with physical activity begin to accrue at levels below the public health target range. For example, the report indicates that small increases in moderate-intensity physical activity provide health benefits among individuals whose activity levels are below the current public health target range. Further, there is no threshold that must be exceeded before benefits begin to occur, and for individuals below the target range, substantial reductions in risk can occur with small increases in physical activity.

Several studies have provided support that small increases in physical activity among physically inactive people are beneficial for health. For example, a meta-analysis of 6 studies (661 137 participants) observed that participants achieving less than 7.5 metabolic equivalent hours per week (approximate lower range of the guidelines) had a 20% lower mortality risk compared with those who did not undertake any physical activity. Another meta-analysis of 8 studies (36 383 participants) that used device-based measures of physical activity demonstrated an approximate 60% risk reduction for all-cause mortality among those achieving 20 to 30 minutes of daily moderate to vigorous activity. However, there was a steep dose-response association at lower levels of activity, with a risk reduction of 45% to 50% among participants achieving 10 to 15 minutes per day of moderate to vigorous activity. More recently, Garcia et al analyzed data from 94 cohorts with more than 30 million participants and reported that 75 minutes per week of moderate-intensity activity (about 11 minutes per day) was associated with a significantly lower risk of mortality, cardiovascular disease, and cancers. Further, based on wrist-worn accelerometer measurements from approximately 72 000 adults in the UK Biobank, just 15 to 20 minutes per week of vigorous-intensity physical activity was associated with a 16% to 40% lower risk of mortality. Step counters, accelerometer-based, and other wearable devices allow individuals to track their physical activity. A recent meta-analysis of 15 studies (47 471 participants) demonstrated significantly lower mortality across successively higher levels of daily step counts up to 8000 to 10 000 steps per day in younger adults (<60 years) and 6000 to 8000 steps per day in older adults (>60 years). These results highlight the importance of promoting physical activity at all levels among inactive adults.

The concept that health benefits can be accrued with physical activity that is less than 150 minutes per week of moderate-intensity, or less than 75 minutes of vigorous-intensity activity, is supported by recent evidence on the dose-response relationship for physical activity and mortality. For example, a meta-analysis of 15 studies (47 471 participants) demonstrated that the risk of all-cause mortality decreased in a dose-response manner with increasing levels of physical activity. In this study, the risk of all-cause mortality was significantly lower among those achieving 75 to 150 minutes per week of moderate-intensity physical activity, or 150 to 300 minutes per week of moderate-intensity, or 75 to 150 minutes per week of vigorous-intensity physical activity, or 150 to 300 minutes per week of vigorous-intensity physical activity, or 75 to 150 minutes per week of vigorous-intensity physical activity, or 150 to 300 minutes per week of vigorous-intensity physical activity.

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vigorous-intensity, physical activity is often overlooked within clinical and community-based approaches, interventions, and recommendations. Moreover, this concept is important for considering how an individual can progress across the spectrum of physical activity while moving toward the range of 150 to 300 minutes per week of moderate-intensity physical activity. This may facilitate engagement as individuals learn how to undertake physical activity within a complex and sometimes busy lifestyle, and to allow individuals at lower levels of fitness and function to physically build toward higher levels of physical activity. In this regard, it may also be important to consider the pattern of physical activity accumulation over the course of a week in addition to the overall duration of physical activity. For example, there is some evidence that a "weekend warrior" pattern, where large amounts of physical activity are accumulated over 1 or 2 sessions per week rather than being evenly distributed over the week, may have health benefits.9,10 O’Donovan et al10 conducted a pooled analysis of 11 cohorts of respondents to the Health Survey for England and Scottish Health Survey and reported similar risk reductions for all-cause, cardiovascular disease, and cancer mortality among people who accumulated 150 minutes or more of moderate-intensity physical activity or 75 minutes or more of vigorous-intensity physical activity in 1 to 2 sessions per week compared with 3 sessions or more per week.

In this issue of JAMA, Khurshid et al9 examined the association between an accelerometer-derived “weekend warrior” pattern in which 150 minutes or more of MVPA with 50% or more of total MVPA was achieved in 1 to 2 days per week vs 150 minutes or more of MVPA but not meeting the weekend warrior definition, with risk of incident atrial fibrillation, myocardial infarction, heart failure, and stroke among 89,573 participants in the UK Biobank. Compared with inactive adults, those with either pattern of physical activity accumulation showed similar, significantly reduced risk of all cardiovascular disease outcomes.9 These results highlight the flexibility with which physical activity can be accumulated to achieve health benefits, which should further enhance opportunities for engagement for large segments of the population.

It is also important to recognize that there is variability in response to physical activity. Some individuals may accrue substantial health benefits at lower levels of physical activity, whereas others may require a higher amount of physical activity to accrue these benefits. Thus, these factors need to be considered and initial intervention targets should focus on encouraging movement as a gateway to higher levels of physical activity, rather than focusing on promoting the range of 150 to 300 minutes per week of physical activity to optimize health. This public health message has been promoted for 2 to 3 decades with minimal to modest impact on population levels of physical activity, which may suggest a different approach to promoting physical activity engagement may be needed.

Translating scientific evidence into public health guidelines is a difficult endeavor for most risk factors, and physical inactivity is no exception. Given that the dose-response association between physical activity and most health outcomes shows no lower threshold for benefit and often shows no evidence of increased risk at the upper end, defining optimal thresholds is somewhat arbitrary. There are clearly benefits to achieving more than 150 minutes of moderate-intensity physical activity per week, but the public health message should also clearly convey that every minute counts, especially among the three-quarters of US adults who do not achieve that goal. Clinicians should become familiar with the full range of recommendations outlined in the Physical Activity Guidelines for Americans, 2nd Edition,1 and personalize prescriptions by setting achievable physical activity goals based on their patients’ age, physical abilities, and current level of physical activity. This allows the prescription to be initiated at lower levels of physical activity and to progress as appropriate based on individual need and ability. Moreover, given that time is often cited as a barrier to physical activity, clinicians can use this information to encourage engagement in physical activity, even at a low level, to enhance the health of their patients.