

ANALYSIS

Recommendations for physical activity in older adults

Older adults find it difficult to meet moderate and vigorous exercise targets. Given that a dose-response exists for physical activity and health benefits, **Phillip B Sparling and colleagues** argue that a change in message to reduce sedentary time and increase light activities may prove more realistic and pave the way to more intense exercise

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Over the past decade, research has increased our understanding of the effects of physical activity at opposite ends of the spectrum. Sedentary behaviour—too much sitting—has been shown to increase risk of chronic disease, particularly diabetes and cardiovascular disease.^{1,2} There is now a clear need to reduce prolonged sitting. Secondly, evidence on the potential of high intensity interval training in managing the same chronic diseases, as well as reducing indices of cardiometabolic risk in healthy adults, has emerged.^{3,4} This vigorous training typically comprises multiple 3-4 minute bouts of high intensity exercise interspersed with several minutes of low intensity recovery, three times a week.

Between these two extremes of the activity spectrum is the mainstream public health recommendation for aerobic exercise, which is similar in many developed countries.⁵⁻⁹ The suggested target for older adults (≥ 65) is the same as for other adults (18-64): 150 minutes a week of moderate intensity activity in bouts of 10 minutes or more. It is often expressed as 30 minutes of brisk walking or equivalent activity five days a week, although 75 minutes of vigorous intensity activity spread across the week, or a combination of moderate and vigorous activity are sometimes suggested. Physical activity to improve strength should also be done at least two days a week. The 150 minute target is widely disseminated to health professionals and the public. However, many people, especially in older age groups, find it hard to achieve this level of activity. We argue that when advising patients on exercise doctors should encourage people to increase their level of activity by small amounts rather than focus on the recommended levels.

The 150 minute target, although warranted, may overshadow other less concrete elements of guidelines. These include finding ways to do more lower intensity lifestyle activity. As people get older, activity may become more relevant for sustaining the strength, flexibility, and balance required for independent

living⁶⁻⁹ in addition to the strong associations with hypertension, coronary heart disease, stroke, diabetes, breast cancer, and colon cancer. Observational data have confirmed associations between increased physical activity and reduction in musculoskeletal conditions such as arthritis, osteoporosis, and sarcopenia, and better cognitive acuity and mental health.⁸⁻¹¹ Although these links may be modest and some lack evidence of causality, they may provide sufficient incentives for many people to be more active.

Research into physical activity

Until recently, we have not been able to measure physical activity accurately, which has limited the quality of evidence. Measurement used to rely solely on interviews and questionnaires, which are prone to error because of factors such as poor recall and tendency to answer questions in a manner that will be viewed favourably. Accelerometers have made more objective measurement of physical activity possible. They are particularly helpful for recording light activity, which may be ubiquitous, interspersed throughout the day, and thus more difficult to recall accurately than vigorous or formal activity or sports.

The US National Health and Nutrition Examination Survey (NHANES; 2003 and 2006) contains accelerometer count data for around 7000 adults aged 20 to 79.¹² Building on previous analyses,^{13,14} we calculated average daily time accumulated (not single sessions) in sedentary behaviour and physical activity of differing intensities (table 1).

Physical activity, sedentary behaviour, and age

The figure 1 shows daily time spent sedentary and in moderate and vigorous physical activity by age. It highlights the low levels

of moderate and vigorous physical activity across all ages and the decline in higher intensity activities with increasing age. Only in the youngest adult age group is the average level above 30 minutes a day. The proportions of time spent sedentary rises with age: from 55% (7.7 hours) at 20-29 years, to 67% (9.6 hours) in those aged 70-79 years. As so little time is spent in moderate and vigorous activities, the higher sedentary time in older adults reflects less time spent in light activity.

Similar results were reported in a large study of older adults in the UK.¹⁶ Collectively, these accelerometer findings from the US and UK indicate that, even when exercise intensity is adjusted for age related decline in physical capacity, only some 10-15% of free living, older adults are meeting the minimum standard for “sufficient activity” (>150 min/week of moderate intensity activity).^{16 17}

Changing emphasis on physical activity in older adults

Although advocates of brief vigorous exercise training promote its time efficiency, real world considerations may prevent many people from doing it. For example, inexperience with intense physical effort, associated fatigue and soreness, risk of injury and medical complications, limited availability of facilities and specialised equipment, and costs of classes and coaching can all act as barriers.¹⁹ The mainstream moderate intensity prescription seems more achievable, but a 150 minute target may still be too high for many older adults.

Focusing on the 150 minute recommendation may mean that the benefits of lesser amounts of exercise are overlooked. The report on physical activity for health from the UK’s chief medical officers⁸ states “the majority of UK older adults have low levels of activity so it is important to emphasise that they can achieve some health benefits from increasing their activity even if it is below the recommendation.” Similarly, advice on prescribing exercise from the American College of Sports Medicine notes, “Adults who are unable or unwilling to meet exercise targets can still benefit from engaging in amounts of exercise less than recommended.”⁹

A recent meta-analysis suggests that risk of death increases significantly when adults sit for more than seven hours a day.¹⁸ However, the authors state that until more conclusive evidence is available, recommendations should continue to be broad—that is, advise adults to sit less and to break up sitting time throughout the day, in addition to adhering to the mainstream physical activity guidelines.¹⁸

Lowering the goal post is not simply a response to the low proportion of adults engaging in “sufficient exercise.” Rather, it is based on the dose-response relation between physical activity and health.⁸⁻¹⁰ A review in the *Annual Review of Public Health* concluded that health benefits begin with any increase above the very lowest levels of activity; the greatest health and functional benefits are found for increments in activity within the lower end of the overall spectrum, where adults are not achieving the mainstream moderate intensity prescription.¹⁰

Recent experimental studies support this finding. For example, postprandial glucose and insulin responses were attenuated when sitting was interrupted with periods of standing and light walking.^{20 21} In addition, a recently published analysis from the English Longitudinal Study of Ageing indicates that physical activity of a lower intensity or smaller amount than the 150 minutes a week recommendation may provide worthwhile health benefits for physically inactive adults.²²

Certainly, much more research is needed, particularly experimental and longitudinal studies using accelerometry to answer questions about benefits provided and characteristics of dose required at the low end of the spectrum.²³ Nonetheless, official documents advise, and recent evidence supports a day long approach to increasing activity and reducing sedentary behaviour. For older adults this can be the starting point on which to build.

Changing conversations with patients

Recommendations could focus on reducing sedentary behaviour by introducing light activity throughout the day. This focus would contain two messages: to sit less and move more. Healthcare practitioners could negotiate how this might happen—for example, increase time in light activities by 30 minutes a day and reduce prolonged sitting by standing or strolling for 1-2 minutes at least once an hour. This approach may be especially relevant for patients who are retired, as employment seems to be an important driver for physical activity in middle aged and older people.²⁴

Advice on how to accumulate time spent in light activity could include getting up from the chair and moving during television commercial breaks, pacing when on the phone, adding gentle five minute walks throughout the day (eg, mid-morning, mid-day, mid-afternoon), and walking rather than driving for short trips. Brief interventions using goal setting and self monitoring have been shown to produce modest decreases in sedentary time.^{25 26}

Adopting such small, incremental changes may better position sedentary patients to add or transition to brief bouts of moderate intensity activity as well as muscle strengthening and balance activities. This approach is not limited by income, education, or time available for leisure.

Would this approach work?

Research into the effect of promoting reduced sedentary behaviour and increasing light activities is lacking. We need to know more about whether adopting light intensity exercise improves health or function, is easier to achieve than higher intensity activity, or leads to more intense activity.

Evidence on the effectiveness of promoting more intense physical activity in primary care is also inconclusive.²⁷⁻²⁹ However, a recent assessment of research literature and existing data found that brief counselling can be an efficient and cost effective means to increase physical activity and realise clinical benefits for various patient groups.²⁹ Most studies are limited by reliance on self report and by the definition of success as having achieved the consensus recommendation. So, participation in more modest levels of activity, along with their benefits, may not be recognised.

In developed countries, adults at age 60 can expect to live another 20-25 years and will have several consultations with their general practitioners every year. Health practitioners could assess physical activity or exercise at every visit, discuss realistic options, set specific goals, and provide support and follow-up; each of these has been found to increase the likelihood of compliance.²⁹⁻³¹ Changes in risk factors, functional capabilities, and general wellbeing can then be tracked.

We are not proposing that the 150 minute a week standard be abandoned. Rather, our purpose is to remind colleagues that a broad perspective to counselling is already embedded in the guidelines and that a whole day approach for older sedentary

patients may help them move towards the recommended activity levels.

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Key messages

Health and functional benefits begin with any increase above the lowest levels of activity; some activity is better than none

New guidelines now advise interspersing prolonged sitting with short bouts of standing and light activity

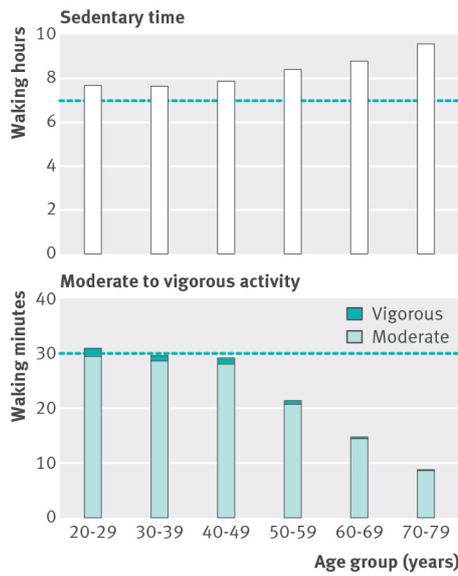
Small increases in activity may enable some older patients to incorporate more moderate activity and thus get closer to the recommended 150 minutes a week

Table**Table 1 | Definitions of sedentary behaviour and differing intensities of physical activity**

Intensity	Examples	Energy expenditure (METs)	Accelerometer threshold (counts/min)[15]
Sedentary time	Sitting, lying down	1.0-1.5	<100
Light intensity	Standing, self care, household activities	1.6-2.9	100-1951
Moderate intensity	Brisk walking and equivalent	3.0-5.9	1952-5724
Vigorous intensity	Jogging, hard physical labour	≥ 6	≥5725

METs=metabolic equivalents (multiples of resting energy expenditure).

Figure



Waking time spent each day sedentary (top) and in moderate or vigorous activity (bottom) among some 7000 US adults aged 20-79. The dotted lines shows the recommended amount of daily exercise (30 minutes) and the level at which sedentary behaviour is estimated to be harmful (7 hours) ¹²