The health benefits of exercise for older people

The importance of exercise for older people is great. Exercise delays the onset of a variety of diseases, increases performance and quality of life, reduces dependency and prolongs life. There is a dose–response relationship between the amount of exercise taken and the benefits which accrue. Unfortunately, although a higher level of exercise produces greater benefits it is less likely to be maintained. Also, the later in life exercise is adopted the more likely it is to be dropped. Regular vigorous exercise should be encouraged in all older people and the sooner they adopt the exercise habit, the more they gain from it.

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An important (and obvious) health goal is to live a long disease-free life. This goal becomes more important as we age, and maintaining quality of life, activity levels and independence becomes another important goal. Regular exercise is a vital tool in achieving these aims. This article reviews the health benefits of exercise, particularly for older patients.

The philosopher Easton championed the benefits of exercise in the 18th century, saying that “an idler never attains a remarkable old age”, but it was not until the 20th century that these benefits were proven. Paffenbarger et al, in a study of nearly 17,000 Harvard graduates aged 35–74, found that taking exercise was inversely related to mortality. Sui et al supported this finding by showing that mortality was fourfold greater in the least fit quintile compared with the top quintile.

Age-related mortality is also reduced by regular exercise. In one study of retired men, the mortality rate was nearly twice as high in those who walked less than 1 mile/week compared with those who walked more than 2 miles/week. Another study, of treadmill testing in elderly patients, found that low exercise capacity was a better predictor of future mortality than the development of angina or ECG changes.

Cardiovascular disease

Most of the data for the health benefits of exercise relates to coronary heart disease (CHD). Morris’ studies of bus drivers and Whitehall civil servants showed that those who took vigorous work or leisure time exercise had a 40% lower rate of CHD compared with those who did not take vigorous work or leisure time exercise.

In his studies, Morris made several discoveries: that intermittent heavy exercise (eg, cycling or swimming) is more effective than lower level activity, even with equivalent totals of exercise; that there is a threshold for the protective effect; and that there is a dose–response relationship above this level.

Numerous later studies have confirmed the association between regular exercise, physical fitness and protection from CHD. The Cooper Institute found the hazard ratios for developing cardiovascular disease to be 1·0 for the least fit, 0·82 for the middle tertile and 0·61 in the fittest tertile.

Exercise can also help patients with established heart disease. A course of graduated physical exercise is usually the centrepiece of the rehabilitation programme following a heart attack or coronary revascularisation. The mortality rate following exercise based rehabilitation is reduced by 20% over the following three years, and the cardiac mortality by 26%.

Obesity

Obesity is an increasing problem in England. About 66% of men in England and 57% of women are overweight (a body-mass index [BMI] of 25–29 kg/m²), and an
additional 24% of men and 25% of women are obese (a BMI of 30 or more). BMI increases with age: more than 30% of men aged 16–24 years and more than 30% of women aged 16–24 years are overweight or obese, but this increases to more than 80% in men aged 65–74 and to more than 70% in women aged 65–7.\(^9\)

Obesity increases the risk of several age-related conditions, such as lower limb osteoarthritis, type-2 diabetes, hypertension and vascular disease.\(^10\) More importantly, mortality increases by 30% for every increment of 5 above a BMI of 25.\(^11\)

It is well documented that regular exercise is an important element in achieving and maintaining a healthy weight. It may also aid weight loss in the absence of dieting.\(^12\) Another advantage of including exercise in a weight-control strategy is that physical fitness ameliorates some ill effects of obesity, even in the absence of weight loss. A study of patients aged 60 years or older showed that both BMI and fitness were strong independent predictors of all-cause mortality. However, the fit obese patients had a lower mortality rate than the unfit of normal weight.\(^13\)

**Hypertension**

Regular exercise reduces hypertension\(^14\)—an effect that is seen without weight loss but is enhanced if weight is lost. It can also prevent and delay the onset of hypertension.\(^15\) In addition, regular physical activity protects hypertensive individuals from left ventricular hypertrophy.\(^16\) But, a blood pressure reading of greater than 180/110 mmHg is generally regarded as a contraindication to vigorous exercise. Therefore, such patients should not start exercise until their blood pressure has been controlled.\(^17\)

**Diabetes**

The rise in the incidence of type-2 diabetes in the UK parallels that of obesity. Currently there are an estimated 2.3 million (diagnosed) patients with type-2 diabetes in the UK.\(^18\)

Similar to its effects on blood pressure, regular exercise (with or without weight loss) helps to prevent the development of type-2 diabetes. This is probably by increasing the number of “slow twitch” muscle fibres (efficient at using exercise oxygen for prolonged exercise), which are more insulin sensitive than “fast twitch” fibres (used for short bursts of vigorous exertion).\(^19\) Exercise is also beneficial for managing type-2 diabetes. The best results for reducing blood glucose are seen when aerobic exercise is combined with strength training.\(^10\)

**Physical functioning**

Due to advances in healthcare and social care, people are living longer and able to live independently for longer. However, because of the world’s ageing population, the number of people who are dependent is increasing.\(^20\)

The English National Fitness Survey\(^21\) showed that 80% of women and 35% of men aged 70–74 years were physically incapable of walking at 3 mph. Physical capacity becomes increasingly important as age increases. For a 50-year-old, not being as fit as they should be for that age will not make a substantial difference to their daily living (unless they are very unfit). But for a 80 or 90 year old, poor fitness levels (relative to those for that age group) may mean that the individual is unable to maintain an independent life. For example, they may require help getting out of a chair or travelling on public transport. Old people are particularly liable
to become dependent if they develop an age-related disease (eg, osteoporosis).

Several studies have shown that regular exercise reduces dependency in older people. A survey of 2,833 Missouri residents aged older than 60 years showed that regular physical activity in the elderly was associated with lower level of activities of daily living dependency (ADL) and a raised BMI was associated with higher ADL-dependency. Also the rate of decline of physical capacity is reduced in regular exercisers.

For elderly patients who already have some functional limitations, further decline in physical functioning can be slowed by maintaining even a low level of physical activity. Exercise must be done on a regular basis if its benefits are to be long term. A trial that investigated weight-training in nursing home residents, aged 90 years or older, showed weight training to be clearly beneficial in terms of strength and self-care scores. But the scores soon fell back to their pre-trial levels after the study ended.

Quantity of exercise

The effectiveness of exercise is proportional to its intensity and total dose.

A study reviewed 500 runners, who were aged 50–59 at the beginning of the study, and compared them with age-matched and sex-matched controls. After 19 years, 15% of the runners had died but 34% of controls had died. Additionally, the average time until the onset of measurable disability was 16 years later for the runners compared with the controls. The health gap between the groups increased through the period of study, and was still widening when the runners were well into their 90s.

The last government’s recommendation for exercise level follows that of the American College of Sports Medicine and American Heart Association: moderate–intensity aerobic physical activity (ie, brisk walking) for a minimum of 30 minutes on five days each week or vigorous-intensity aerobic activity (ie running) for a minimum of 20 minutes on three days each week.

This level of exercise has considerable benefits, including increased fitness and reduced all-cause mortality, although these gains are greatly outstripped by those of more vigorous programmes. A balance must be struck between the benefit of very intense exercise and the likelihood of this level being taken up and sustained, and this is recognised in the current recommendations. The best evidence supports home-based, walking exercise as the modality most likely to be beneficial to the majority of older people.

Encouraging exercise

The level of exercise taking in the population is lamentably low—overall, only 39% of men and 29% of women meet the current recommended physical activity target. These figures decline rapidly with age. Half of all men aged 16–34 years meet the current recommended physical activity levels but this drops to 9% for those aged 75 or older. With women, the figures are 33–36% for the 16–34 age group and 4% for the 75 plus age group.

Encouraging people to take more exercise is a difficult task and may be more likely to be accomplished through the political arena than the consultation room, as advice given during consultations is ineffective. The Coalition Government has yet to discuss the benefits of exercise and did not mention exercise in its White Paper Equity and excellence: Liberating the NHS. But, its announcement that it will no longer fund free swimming for people over the age of 60 is not encouraging. However, the Chief Medical Officer’s 2009 Annual Report devotes a whole chapter to the importance of “nature’s cure” (ie, exercise), stating: “Inactivity affects 60–70% of the adult population: that is more people than obesity, alcohol misuse and smoking combined.”

There are many schemes for prescribing exercise—most local authorities have schemes for “exercise on prescription” at their local sports centres. The rate of referral to such schemes is, however, extremely low and the level of uptake and completion even lower or totally ineffective. Furthermore, such referral systems do not increase exercise habits in the longer term.

Exercise schemes can be effective but only if combined with much input to encourage the individual and nurture the changes in attitudes and behaviour that are required. A New Zealand study enrolled 1089 women aged...
40–74 into a controlled trial of exercise referral and achieved a modest increase in exercising rate in the treated groups at two years. The intervention included initial motivational interviewing, regular follow-up telephone calls (a total of 75 minutes per patient) and a home visit at six months. The increased exercise was not associated with improved clinical outcomes but an increased risk of falls and injuries.

**Conclusion**

Regular exercise is the most effective "treatment" available to prevent and treat a wide range of diseases, and maintain physical fitness, muscular strength and activity in old age (especially quality of life). Indeed a dose response between amount of exercise taken and quality of life has been demonstrated. However, although the greater the "dose" of exercise the greater its effect, the less likely the majority of older people are to maintain it. Taking up exercise later in life becomes as effective as long-term exercise if it is maintained for a decade. But, taking up exercise once disability has set in is much less likely to be beneficial.

Despite the known facts of the benefits of physical activity, more than 90% of older people fail to take enough regular exercise to improve their health. We need political action to achieve public awareness of these facts and encourage older people to increase their exercising habits. Perhaps the best target group would be the recently retired—those young enough to be able to start exercising and with the time to do it. The gains will be great. Not only will people remain well, live longer and enjoy life more but the period of ill health at the end of life will be reduced with huge financial benefits for the whole population.

**References**

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