# Physical activity

## The cheapest polypill on the market

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**There is now strong evidence that regular physical activity reduces the risk of a range of health problems. Assessing patients for physical activity and encouraging regular participation should be part of routine care.**

Physical inactivity is a major modifiable cause of disease burden worldwide and the fourth leading risk factor for global mortality behind tobacco smoking, hypertension and elevated blood glucose, yet 60% of Australians do not meet the recommended guidelines for physical activity.[1,2] Traditionally, medical teaching has emphasised obesity as a risk factor for death and disease, with surrogate markers for obesity (BMI and waist circumference) easy to obtain in a physical examination. Weight loss via calorie restriction, exercise or a combination of both remains the cornerstone of therapy for overweight and obese individuals. However, emerging evidence suggests that a shift in focus to promoting increased cardiorespiratory fitness by encouraging regular participation in physical activity – rather than attempted weight loss – may actually decrease the burden of disease far more significantly.[1,2]

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### Fitness versus fatness

The association of cardiorespiratory fitness and weight status with mortality from all causes has been studied using meta-analytical methodology.[3] In this study, 92,986 participants were divided into three weight groups: normal weight (BMI 18 to 25 kg/m$^2$), overweight (BMI 25 to 30 kg/m$^2$) and obese (BMI >30 kg/m$^2$); these groups were then split into 'fit' and 'unfit' groups based on cardiorespiratory fitness during $VO_2$ testing, which measures maximum oxygen consumption and muscle efficiency. The fit group was defined as participants with the top 80% of fitness scores in each weight category and the unfit group was defined as those with the bottom 20% of fitness scores. The groups were followed over time and the risk of death in each group was compared to the normal-weight fit group. The overweight and obese fit groups had a small, insignificantly increased risk of death compared to the normal-weight fit group (1.13 and 1.21 more times likely to die, respectively). However, all three unfit groups had alarmingly increased risk. The unfit normal-weight group were 2.42 times more likely to die than their fit counterparts, and the increased risk was 2.14 times in the unfit overweight group and 2.46 times in the unfit obese group.

This study highlights the importance of physical activity, and shows that it is better to be fit and fat than to be normal weight and unfit.

### Benefits of regular exercise

Regular participation in physical activity increases cardiorespiratory fitness and is known to reduce the risk of health problems (Figure 1). These include cardiovascular disease and stroke, type 2 diabetes, cancer, depression, osteoarthritis and osteoporosis.

#### Exercise and cardiovascular disease

Exercising regularly decreases the risk of coronary disease, cardiac events, and cardiovascular death for both primary and secondary prevention. Physical inactivity is associated with almost double the risk of coronary heart disease and results in poorer prognosis in survivors of myocardial infarction compared with their more active counterparts.[4] Regular exercisers are 25% less likely to die

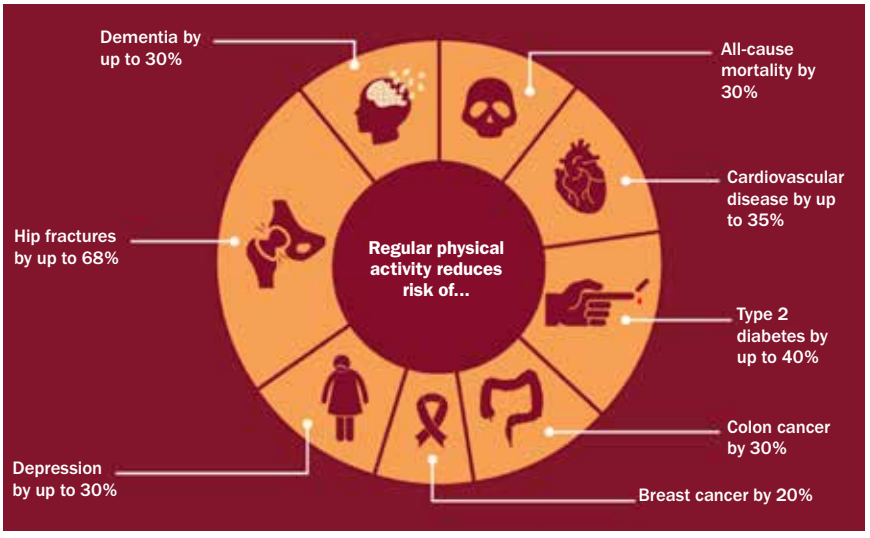


**Figure 1.** What are the health benefits of physical activity?

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**Figure 2.** Physical activity helps lift spirits and relieve stress.

after a myocardial infarction than sedentary people.[4] Exercise reduces cardiovascular risk partly by improving lipid profiles, predominantly by a reduction in serum triglycerides and an increase in serum high-density lipoprotein (HDL) cholesterol, along with a less well-defined reduction in low-density lipoprotein (LDL) cholesterol.[4] Regular exercise can also lower blood pressure by 5 to 15 mmHg within four weeks in people with primary hypertension.[4] Exercise improves functional capacity in people with existing heart disease and can reduce angina symptoms, lessen breathlessness associated with heart failure and reduce claudication associated with peripheral vascular disease.

### Exercise and type 2 diabetes

Exercise can improve glycaemic control in patients with type 2 diabetes. During exercise, muscle contractions stimulate the uptake of blood glucose into the working muscle independent of the action of insulin.[5] Therefore, blood glucose uptake into working muscle is normal during exercise, even when insulin-mediated uptake is impaired in the setting of type 2 diabetes. Muscular blood glucose uptake remains elevated post-exercise, with the contraction-mediated pathway persisting for several hours. Physical activity also enhances skeletal muscle response to insulin, increasing insulin sensitivity for hours to days after exercise, which helps to reverse or prevent the effects of type 2 diabetes.[5]

### Exercise and cancer

Exercise can provide some protection against breast, colorectal, prostate, endometrial and pancreatic cancer.[6] Exercise during treatment for cancer can help manage side effects, reduce negative effects of treatment (e.g. muscle loss, fatigue), delay progression of disease, lower recurrence rate and improve survival.[7] The link between survival of cancer and exercise is strongest in observational studies of survivors of breast, colorectal or prostate cancers.[6]

### Exercise and depression

Regular exercise reduces stress, anxiety and depression.[4] Physical activity helps lift spirits and relieve stress by releasing mood-elevating hormones. Exercise can be used as a monotherapy in mild depression and as an adjunct therapy in more severe forms. In a recent study of a healthy cohort of 33,908 people followed for 11 years, physical activity at any intensity for at least one hour per week provided protection against future depression but not anxiety.[8]

### Exercise and osteoarthritis

Exercise reduces joint pain and helps protect joints by building muscle strength to lighten the load on them. Exercise along with weight loss, when weight loss is indicated, are key components in the management of pain related to osteoarthritis. Clearly, the right type of exercise is important and depends on the joints involved.

### Exercise and osteoporosis

Weight bearing and impact exercises can prevent bone loss associated with ageing and improve bone mineral density in patients with low bone density.[4] Regular exercise also reduces the risk of falls and fractures.[4]

## Physical activity guidelines for health

The WHO recommends that adults undertake 150 minutes per week of moderate

**PRACTICAL TIPS FOR EXERCISE PRESCRIPTION***

- A two- to four-minute intervention in primary care effectively promotes physical activity.
- A conversation about physical activity can be started by asking two simple questions:
  - on average, how many days per week do you engage in physical activity at least equivalent to brisk walking?
  - on those days, for how many minutes do you engage in this activity?
- A written prescription is essential to signal that physical activity and exercise are valid treatment methods for disease – we suggest three lots of 10-minute exercise blocks per day for five days of the week as a guide.
- It can be helpful to suggest that patients commence exercise at an intensity that they are already comfortable with, such as slow walking at a pace they would walk at to do their shopping, and build up from there.
- Follow up is critical to reinforce the message and investigate barriers to participation.
- Regular participation in moderate intensity exercise confers minimal risk and can be self-administered, like an over-the-counter medication. It is defined as any activity performed with a moderate amount of effort (55 to 70% of maximum heart rate), where individuals have increased breathing and sweating but can still maintain a conversation.
- Compliance to ongoing participation is maximised if the individual chooses an activity they are comfortable with, such as brisk walking, cycling, swimming, water aerobics or any other activity performed in 10- to 30-minute bouts at a pace that they could sustain for up to an hour if needed.
- Medical clearance is not needed for patients with stable asymptomatic cardiovascular, metabolic or renal disease who are already active, but is recommended for those who are inactive.
- For exercise more vigorous than a brisk walk or exceeding demands of everyday living, previously sedentary and older people may benefit from being assessed for conditions that might be associated with higher cardiovascular risks.
- Referral to a sport and exercise physician may be indicated for patients with conditions classified as high risk of morbidity and mortality associated with physical inactivity, as well as those having difficulty engaging in regular exercise due to lack of motivation, injuries or safety concerns.

* Adapted from reference 9.

physical activity such as walking.[1] This equates to half an hour per day for five days a week, which can be split into three 10-minute bouts of activity.[1] Alternatively, the same benefits are derived from 75 minutes per week of vigorous activity (e.g. jogging or other aerobic exercise).[1] Additional health benefits are available when this amount is increased to 300 minutes of moderate activity (60 minutes each day for five days) or 150 minutes of vigorous activity.[1] The WHO guidelines also recommend additional participation in strength exercises for all the major muscle groups twice per week; older adults at risk for falls benefit from including balance exercises as well.[1]

## Final comments

Medical professionals should be comfortable prescribing physical activity as a key strategy to address widespread levels of inactivity. From a global health perspective, counselling to increase physical activity levels is more effective than counselling to quit smoking. The number needed to treat for one person to achieve the minimum recommended 150 minutes of moderate intensity exercise per week is 12.[2] This is much lower than the clinical input needed to achieve a similar health benefit by one person quitting smoking, where the number needed to treat is between 50 and 120.[2] In regard to physical activity levels, the biggest positive change in health risk is in changing from inactive to somewhat active (75 to 90 minutes of exercise per week), which results in a 15% reduction in risk of mortality.[2]

Regularly assessing patients for physical activity should be part of routine care. Some practical suggestions for exercise prescription are given in the Box.[9] MT

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