

**BHF National Centre for Physical Activity and
Health**

Physical activity and health fact sheet

November 2009

Introduction

Evidence clearly demonstrates that an inactive lifestyle has a substantial negative effect on both individual and public health.¹ Many of the leading causes of disease and disability in our society are associated with physical inactivity, such as Coronary Heart Disease (CHD), strokes, obesity, type II diabetes, hypertension, colo-rectal cancer, stress, anxiety, osteo-arthritis, osteoporosis and low back pain.²

Estimates have shown that 37% of CHD deaths can be attributed to physical inactivity, 19% to smoking and 13% to high blood pressure.³

Strong evidence confirms that there are many potential health benefits associated with being regularly active.⁵⁻¹¹ The Chief Medical Officer recommends that adults participate in at least 30 minutes of physical activity on at least five days of the

week. This activity can be accumulated in bouts of 10 minutes or more.¹ Evidence suggests that physical activity:

Reduces the risk of premature mortality

In the year 2007, approximately 117,370 men and 79,062 women died prematurely^γ from all-causes in the United Kingdom.⁴

Achieving the recommended levels of moderate intensity physical activity can reduce premature mortality by between 20-30%.¹

A large-scale population-based prospective study of over 80,000 Japanese men and women found a significant inverse association between daily total physical activity level and all-cause mortality. A significantly decreased risk was observed for death from cancer and heart disease in both

^γ Premature death is defined as death before the age of 75 years.

sexes, and from cerebrovascular disease in women.⁵

Reduces the risk of Cardiovascular Disease (CVD)

Cardiovascular Disease (CVD) is one of the main causes of premature death in the UK. In 2007, CVD caused over 51,095 premature deaths in the United Kingdom.⁴ This represents 26% of premature deaths from all-causes.

A prospective study of 27,055 apparently healthy adult women has shown that physical activity energy expenditure of 200 – 599kcal/wk, 600-1499kcal/wk and ≥1500kcal/wk is associated with CVD relative risk reductions of 27%, 32% and 41% respectively.⁶

A meta – analysis of prospective studies that examined the association between walking, CVD risk and all-cause mortality, found that the pooled hazard

ratio of CVD in the highest walking category compared with the lowest was 0.69, and 0.68 for all-cause mortality. Walking pace was a stronger independent predictor of overall risk compared with walking volume (48% versus 26% risk reductions, respectively).⁷

The benefits of physical activity and fitness extend to patients with established cardiovascular disease. In patients with chronic ischaemic heart disease, exercise (as part of a cardiac rehabilitation programme) has been shown to reduce mortality and may have a role in patients with stable angina.⁸

Reduces the risk of developing some cancers

Colo-rectal cancer accounts for 4% of premature deaths in men and women in the UK. In 2007, over 6000 women died prematurely from breast

cancer in the UK, accounting for 8% of premature deaths among women.⁴

The World Cancer Research Fund (WCRF) and American Institute for Cancer Research (AICR) found convincing evidence that physical activity protects against colon cancer. Possible mechanisms include reduced gut transit time and the beneficial effects of physical activity on body fatness.⁹

A recent meta-analysis reported an inverse association between physical activity and colon cancer with an overall relative risk of 0.76.¹⁰

The CMO report 'At least five a week' presents the evidence that the most active individuals have on average a 40-50% lower risk of developing colon cancer than the least active individuals.¹

Physical activity is associated with a reduced risk of breast cancer in post-

menopausal women. Evidence from two cohort studies analysed in the WCRF report demonstrated decreased risk of postmenopausal breast cancer for the highest activity group when compared to the lowest. Effect estimates were RR 0.43 and RR 0.20, comparing highly active with inactive women.⁹

Physical activity has also been shown to have a small protective effect on endometrial cancer.¹¹ Possible mechanisms include the beneficial effect of physical activity on body fatness and effects on endogenous steroid hormone metabolism. Also, high levels of physical activity are associated with lower levels of circulating oestrogens and androgens in postmenopausal women.¹¹

Reduces the risk of developing type II diabetes

According to Diabetes UK there are around 2.5

million people in the UK diagnosed with diabetes.¹² This may be a conservative estimate as it is suggested that a further 500,000 people in the UK suffer from diabetes but have not been diagnosed. It is estimated that 1 in 20 people in England has diabetes (diagnosed and undiagnosed) and that 90% of these cases are type II diabetes.

A physically active lifestyle plays a vital role in both management of type I diabetes and prevention and management of type II diabetes. Clinical trials have shown that lifestyle interventions that include physical activity can decrease progression of pre-diabetes to type II diabetes by between 31% to 63% in adults with impaired glucose tolerance at baseline.¹³

Helps prevent or reduce hypertension

According to the Health Survey for England (HSE), 39% of men and 29% of

women have hypertension.^{14v} For adults aged 40-69 years, each 20mmHg increase in usual systolic blood pressure or 10mmHg increase in usual diastolic blood pressure, doubles the risk of death from CHD.¹⁵ Epidemiological studies indicate that uncontrolled elevated blood pressure can also lead to stroke, congestive heart failure and end-stage renal disease.¹⁶

Regular physical activity helps to reduce both systolic and diastolic blood pressure in individuals with elevated blood pressure by approximately 3.8mmHg and 2.6mmHg respectively.¹⁶

Blood pressure reductions associated with aerobic exercise have been found to exceed that of the effects of sodium

^v hypertension is defined here as systolic blood pressure of 140mmHg or over, or a diastolic blood pressure of 90mmHg or over.

reduction, potassium supplementation and alcohol reduction on systolic and diastolic blood pressure.¹⁶

With regards to appropriate exercise intensity to realise these benefits, evidence shows that low-to-moderate intensity exercise (approximately 60% to 85% of age-predicted maximum heart rate) is more effective in lowering blood pressure when compared to higher intensities.¹⁷

Helps to prevent or reduce osteoporosis

Almost 3 million people in the UK suffer from osteoporosis. One in two women and one in five men will suffer a fracture after the age of 50.¹⁸

Around 42% of over 75 year olds living in the community will fall each year. One in three of these falls will result in a fracture and UK based research has shown mortality of 18% at 3 months following a hip fracture. 80% of older

women report they would rather die than experience the reduced quality of life that follows a serious hip fracture.¹⁸

The Nurses Health Study (a 12 year cohort of 61, 200 registered Nurses within 11 US states) found that 'active women with at least 24 MET-h/wk had a 55% lower risk of hip fracture (relative risk [RR], 0.45) compared with sedentary women with less than 3 MET-h/wk. Even women with a lower risk of hip fracture due to higher body weight experienced a further reduction in risk with higher levels of activity. Among women who did no other exercise, walking for at least 4 h/wk was associated with a 41% lower risk of hip fracture (RR, 0.59; 95% CI, 0.37-0.94) compared with less than 1 h/wk'.¹⁹

Physical activity that stresses the bone can increase bone mineral density in young people, maintain it in young

adults and slow its decline in old age.¹ Physical activity interventions can help prevent falls among the elderly by up to 25%.¹

Helps to control weight and lower the risk of becoming obese

According to the Health Survey for England (2007)¹⁴ approximately 44% of men and 32% of women are overweight and an additional 13% of men and 18% of women are obese (including morbidly obese.)[€]

People with higher levels of physical activity generally report lower body weight, body mass index and skin-fold measures.²⁰

Using HSE data, prevalence of overweight and obesity among men with low levels of physical activity is 71.7%. This falls to 59.7% among men with high activity levels. A

[€] Overweight – Body Mass Index (BMI) of 25-30kg/m², Obese – BMI of more than 30kg/m²

similar pattern is seen among women; 63% of women with low activity levels are overweight and obese compared with 47% of women with high activity levels.²⁰

Promotes psychological well-being

According to the Office of National Statistics mixed anxiety and depression is experienced by 9.2% of adults in Britain. This is followed by general anxiety at 4.7 % and depression (without the symptoms of anxiety) at 2.8%.²¹

Physical activity may help people with generalised anxiety disorder, phobias, panic attacks and stress disorders and can have a positive effect on psychological well-being in people with schizophrenia.¹ Physically active people feel happier and more satisfied with life. Furthermore, being physically active has a positive effect on self-

esteem and self-perceptions such as body image.

Enhances and protects brain function

Dementia currently affects over 700,000 people in the UK, this represents 1 person in every 88 of the UK population. The number of people with dementia in the UK is forecast to increase by 38% over the next 15 years and by 154% over the next 45 years.²² Delaying the onset of dementia by 5 years with a combination of improvements in public health and specific preventive treatments, would halve the number of UK deaths directly attributable to dementia – saving nearly 30,000 lives annually.²²

Studies have shown a causal relationship between fitness training and improved cognition, more efficient brain function and spared brain volume in older adults.²³ Physical activity may have the potential

to prevent, delay, or slow the progression of dementia.²⁴

Review level evidence shows that older adults who exercise regularly are less likely to experience cognitive decline. Possible mechanisms proposed in the association between physical activity and cognitive decline include vascular disease, inflammation and neurogenesis.²⁵

Can help in the Management of Painful Conditions

Osteoarthritis is a common, chronic, musculoskeletal disorder. Symptomatic osteoarthritis, particularly of the knee and hip, is the most common cause of musculoskeletal disability in elderly people.²⁶

Therapeutic exercise is used as one modality to treat people with osteoarthritis. Both high intensity and low

intensity aerobic exercise appear to be equally effective in improving a patient's functional status, gait, pain and aerobic capacity in people with osteoarthritis of the knee.²⁷

Physical activity can help prevent osteoarthritis by enhancing the role of synovial fluid, strengthening the muscles that protect and stabilise joints and reducing obesity.¹

Some of the symptoms of fibromyalgia[‡] are improved by short-term aerobic fitness training. The most consistent improvements have been noted in pain threshold using pressure, global well-being and aerobic performance.²⁸

Exercise is an inexpensive, low risk option compared with other more invasive therapies for

[‡] A chronic disorder characterised by widespread musculoskeletal pain, fatigue and a range of other symptoms.

intermittent claudication and can provide significant benefit to patients with leg pain.²⁹

Physical activity is also used as a strategy to reduce disabling consequences from chronic health problems caused by HIV infection. A Cochrane review found that performing constant or interval aerobic exercise, or a combination of constant aerobic exercise and progressive resistive exercise, for at least 20 minutes three times a week, for at least four weeks, appears to be safe and may be able to improve cardiopulmonary fitness and especially psychological wellbeing for adults living with HIV/AIDS.³⁰

Health risks of physical activity

Although physical activity has numerous health benefits, there are potential adverse effects associated with being physically active, ranging from those that

cause minor inconvenience to those that are life threatening. However, the risks associated with taking part in physical activity among low risk individuals at levels that promote health are low. The health benefits of physical activity far outweigh the risks.

Most musculoskeletal injuries related to physical activity are likely to be preventable by gradually working up to a desired level of activity and by avoiding an excessive amount of activity.

Vigorous physical activity can acutely and transiently increase the risk of acute myocardial infarction and sudden cardiac death in susceptible individuals, although the overall benefit of regular physical activity is lower all-cause mortality.³¹

Summary

Allender et al's (2006) research report suggests that, in 2003–4, over 35 000 deaths could have been avoided if the population were physically active at the levels recommended by the UK government. They found that physical inactivity was responsible for 3.1% of morbidity and mortality in the UK.³² The World Health Report (2002) places physical inactivity as one of the top 10 leading causes of death and disability in the developed world.²

Given the prevalence of physical inactivity and the compelling evidence on the health benefits of regular moderate to vigorous physical activity, physical activity appears to be an excellent buy in public health.

Key facts

- ❖ Achieving the recommended levels of moderate intensity physical activity can reduce premature mortality by between 20-30%.¹
- ❖ A recent meta-analysis reported an inverse association between physical activity and colon cancer with an overall relative risk of 0.76.¹⁰
- ❖ Clinical trials have shown that lifestyle interventions that include physical activity can decrease progression of pre-diabetes to type II diabetes by between 31% to 63% in adults with impaired glucose tolerance at baseline.¹³
- ❖ Regular physical activity helps to reduce both systolic and diastolic blood pressure in individuals with elevated blood pressure by approximately 3.8mmHg and 2.6mmHg respectively.¹⁷

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- 10.1136/jech.2006.050807

Published by:

The British Heart Foundation National Centre for Physical Activity and Health
Loughborough University
www.bhfactive.org.uk

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