



Physical activity

Focus
AUSTRALIAN INSTITUTE OF HEALTH AND WELFARE

Introduction

The theme of the National Heart Foundation of Australia's Heart Week 2001 is the major cardiovascular disease risk factor, physical inactivity. As part of this important initiative, a special focus section on physical activity has been included in this report. The section is written by three leading experts in the field of physical activity in Australia. Professor Adrian Bauman of the University of New South Wales comments on the emerging evidence² that physical activity reduces the risk of cardiovascular disease. Dr Tim Armstrong of the Australian Institute of Health and Welfare writes on the current patterns of physical activity among Australian adults. Mr Trevor Shilton, on behalf of the National Heart Foundation of Australia's National Physical Activity Program Committee, outlines that organisation's community approach to improve the participation of all Australians in physical activity.

Physical activity's relationship to cardiovascular disease

Physical inactivity as a risk factor

The acceptance of physical inactivity as a major risk factor for cardiovascular disease has, until fairly recently, lagged behind that for the other 'established' risk factors (i.e. smoking, high blood cholesterol, high blood pressure). Interest in the effects of physical activity upon health has rapidly increased since the publication in the United States in 1996 of *Physical Activity and Health: a Report of the Surgeon General*. Now, some physiologists even describe the 'epidemic of inactivity' as a key component of the increase in chronic disease in developed countries. Given the high prevalence of inactivity, the effect on the Australian population of physical inactivity appears substantial—at least as important as a reduction of high cholesterol or high blood pressure.

Although this section focuses on physical activity and its relationship to cardiovascular disease, it should be noted that there are other benefits to being physically active. These include helping to prevent conditions and diseases such as diabetes, injury and some forms of cancer, as well as positively influencing mental and social health and wellbeing.

Quality of evidence

Much of the evidence and data appearing on these pages refer to population studies relating to the primary prevention of heart disease, stroke and vascular disease.

The quality of evidence showing physical inactivity as a risk factor for cardiovascular disease is comparable to that showing the risks of active and passive smoking. Active and passive smoking are recognised as having a causal role in heart disease and stroke. Similarly, physical inactivity is now recognised as having a causal role in heart disease and stroke.

The strength of evidence for the influence of physical activity upon cardiovascular disease is enhanced by consistency across studies. Despite small differences in study design, the association between inactivity and various cardiovascular problems (coronary heart disease, fatal heart attack, ischaemic stroke) remains remarkably consistent. Recent studies demonstrate that the effects of physical inactivity are independent of, and often more important than, other risk factors such as high blood cholesterol levels, high blood pressure or obesity. Well-designed studies tend to show stronger associations between physical activity and reduced incidence and death from cardiovascular disease. These studies, together with increasing attention to possible biological mechanisms, provide strong evidence for a highly protective relationship between physical activity and heart disease.

Effects of physical activity on preventing heart disease

Several early studies of physical activity in the population have compared people with greatly different energy expenditures at work. After socioeconomic disadvantage was taken into account, it appeared that physical activity was related to the risk of developing coronary heart disease. This led to two decades of intermittent research showing that increased physical activity at work was associated with a reduction in coronary heart disease and death.

In the 1970s, large population (epidemiological) studies appeared, focusing on the health effects of leisure-time physical activity. By the mid-1980s, these studies had showed that those in the population who did no physical activity had around twice the rate of cardiovascular disease compared with those who were physically active. More recent studies have continued to strengthen the evidence for the protective role of physical activity.

The accumulated dose and required intensity of activity required for a health benefit is well accepted for cardiovascular disease protection. In terms of intensity, current evidence suggests 'moderate' activity is sufficient. Generally, moderate intensity is defined as activities performed with an intensity of at least three times the basal or resting metabolic rate (e.g. a brisk walk).

In terms of frequency, the cardio-protective benefit of 'accumulating' this energy expenditure from short bouts throughout the day, compared with a single longer session, remains the subject of further research. However, the total daily 'dose' of energy expenditure required for a health benefit appears to equate to at least half an hour of moderate activity, such as brisk walking, on most days of the week.

There are biologically plausible mechanisms for the observed reductions in cardiovascular disease from participation in physical activity, and other potential benefits may occur through changes in other risk factor profiles induced by increased physical activity.

Physical activity and people with heart disease

It is generally accepted that physical activity has benefits for those with established coronary heart disease. Studies on people with heart disease who became active have shown increased fitness, improved oxygen consumption and decreases in ischaemic responses. The current physical activity recommendations, emphasising activities of moderate-intensity, place patients at lower risk of heart attack, and allow the adoption of exercise regimens with greater safety. There are risks of acute cardiac events, especially among those who have been inactive and suddenly resume vigorous activity, but overall the benefits outweigh the risks.

Physical activity has a range of benefits for cardiac patients, not only those with coronary artery disease but also for many with left ventricular dysfunction and heart failure. Exercise advice should generally be medically supervised in these higher risk groups.

Physical activity and stroke

The relationship between physical activity and the prevention of stroke is made more difficult by the different biological causes of stroke. Recent studies have produced some encouraging results, showing that physical activity can reduce the risk of ischaemic stroke. Physical activity may have this effect through reducing blood pressure levels, or through reducing clot formation.

Effects of physical activity on other cardiovascular risk factors

One way physical activity reduces the risk of cardiovascular disease is through its beneficial effects on other risk factors. Epidemiological studies show the independent effects of physical activity, which persist even after the effects of other cardiovascular risk factors have been taken into account. However, physical activity also appears to have a direct role in improving several cardiovascular disease risk factors, including blood pressure, overweight, and cholesterol levels, as well as in reducing the incidence of diabetes.

Specifically, in terms of high blood pressure, vigorous physical activity decreases systolic and diastolic blood pressure by approximately 6–7 mmHg. Physical activity also improves the lipid profiles of those with raised blood cholesterol levels. The effects of prolonged physical activity suggest that it will reduce total cholesterol by about 6%, reduce low-density lipoprotein by 10% and increase high-density lipoprotein by 5%.

Physical activity has a role in weight loss as well as weight maintenance. Those who are active show lower body mass indexes and more favourable waist-to-hip ratios. In long-term trials, physical activity alone can produce a weight loss of 2–3 kg, lasting to 12-month follow-up (long-term studies are lacking at present). It should be noted here that prolonged physical activity, perhaps as much as 60–80 minutes of moderate physical activity per day, is generally required for weight loss. This represents more physical activity than is required for overall cardiovascular disease benefit or blood pressure control.

There is also some evidence that physical activity by young people and adolescents can also improve their blood lipid profiles, and may further have a favourable impact upon blood pressure levels.



Australian Facts

Current patterns of physical activity in Australia

Data from the 1999 National Physical Activity Survey indicate that most Australian adults (around 90%) were well aware that participation in moderate-intensity physical activity would improve their health. Further, between surveys in 1997 and 1999, there was an increase in overall knowledge of the health benefits of physical activity and in the awareness of public health messages about physical activity. However, despite this knowledge, the proportion of people undertaking physical activity at levels sufficient to improve their health actually declined during that period. People did physical activity on fewer occasions each week in 1999 than in 1997. Further, on the occasions they did do physical activity, they spent, on average, less time doing it. The proportion of people doing no physical activity at all in the week prior to interview (i.e. being sedentary) actually increased between 1997 and 1999.

In 1999, just over half the Australian population were undertaking physical activity at the level recommended to achieve health benefits. Detailed data on participation in physical activity for a health benefit can be found in the **Physical inactivity** section of this report.

Certain groups in the population were less likely to participate in physical activity in 1999. These included obese people, older people, women and people with at least one child at home.

Perhaps one heartening result from the 1999 National Physical Activity Survey was that one-third of adults surveyed said that they intended to become more physically active in the next month.

Promoting physical activity

Physical activity—a public health priority and a community concern

The scientific evidence for the benefits of physical activity, and the worrying trends of decreasing physical activity and increasing overweight, has given rise to a need for greater focus on physical activity as a public health issue.

Making people aware of the health benefits of physical activity is a major challenge for public health policy makers, health care providers and communities. Effective interventions are required to fulfil the overall population-health aim

to increase total physical activity in the community. One process in Australia has been the development of National Physical Activity Guidelines, which serve to bring public attention to the minimum amount of physical activity required to achieve health benefits.

The guidelines are as follows:

- Think of movement as an opportunity, not as an inconvenience.
- Be active every day in as many ways as you can.
- Put together at least 30 minutes of moderate activity on most, preferably all, days.
- If you can, also enjoy some regular vigorous exercise for added health and fitness.

These guidelines operate within a broader physical activity initiative in Australia, namely the Active Australia campaign. This campaign brings together the major stakeholders from government and other government sectors to provide the structures for effective promotion of, and opportunities to participate in, physical activity in Australia. In addition to the public health benefits that may accrue from a physically active community, physical activity has the potential to deliver major social, economic, environmental and community benefits.

An approach to increase physical activity in communities has been recommended by the National Heart Foundation of Australia. These recommendations are derived from the public health principles outlined in the Ottawa Charter.

Recommendations from the National Heart Foundation of Australia³

The recommendations that follow outline ten broad strategies for increasing physical activity in communities. There is growing recognition that, while some strategies may prove independently effective in raising community levels of physical activity, a combination of strategies is best for increasing population levels of physical activity.

1. *Provide a supportive physical and social environment through settings where Australians live and work.*

Physical activity choices can be made convenient, easier, safer and more enjoyable through modifications in the physical and social environment. Efforts should be made

to ensure that environments are designed to enable people to be active as part of their everyday tasks, e.g. walking to the shop to buy the newspaper.

Settings such as schools, workplaces and neighbourhoods offer practical opportunities for carrying out comprehensive strategies to increase physical activity. The environments with high priority are parks, green spaces, streetscapes, beaches and recreation facilities, as these are the most frequently used environments for physical activity.

2. Build 'active' public policy.

Across all sectors and at all levels in the community, policy decisions can influence the choices individuals make about physical activity. Policy can be responsible for creating or removing barriers to participation in physical activity.

3. Provide education and publicity about the benefits of physical activity, and access to information and life skills to enable participation.

Education, information and mass media campaigns are useful to promote awareness of the benefits of being active. They may also motivate people to take part, and publicise options for participation. Education programs and mass media, when used in combination with environment change and policy strategies may also affect behaviour.

4. Focus on the different levels of behaviour change and identify aspects of behaviour change that need addressing most and tailor programs accordingly.

The different approaches used to promote activity often focus on different stages of behavioural change. That is, some people are ready for action yet others have not even thought about it, and interventions must be adapted accordingly.

This stages of change approach is much more relevant when dealing with individuals. Applications of this approach have the most relevance in clinical and educational settings. Approaches that focus on stages of change have less relevance when targeting whole communities in which individuals will be at different stages, or in community-wide health promotion.

5. Provide program options to suit varying social and cultural circumstances and motivations throughout the life cycle.

Within communities, particular groups of people have been identified as being less likely to achieve adequate levels of physical activity. For example, inactive people are more likely to be older, less well-educated, and on lower incomes.

Physical activity for health and wellbeing should be a lifelong pursuit. Physical activity planners need to be aware that the circumstances, interests and capacity of individuals change throughout life. Activities likely to appeal to children, youth, seniors, ethnic groups, people with disabilities, people in the full-time workforce and women with dependent children may vary considerably.

6. Provide accurate advice on physical activity to key professionals within government, non-government, community and private sectors that influence physical activity participation.

The physical activity workforce is potentially very broad. Health professionals, local government planners, sport and recreation professionals, general practitioners, allied health professionals and volunteers could all have an influence on population levels of physical activity.

7. Establish partnerships to ensure cross-community and intersectoral approaches.

Partnership programs in physical activity have been recommended as the most prudent in achieving broad change in communities. Achieving sustainable increases in levels of community physical activity, and changes in the physical and social environment that will support physical activity choices, will require forging new partnerships and collaborations with sectors outside health.

Successful partnerships between sectors requires hard work and good will, as well as commitment to action, a considerable investment in building relationships, an agreed plan of action and planning to sustain outcomes.



Australian Facts

Partnerships across sectors may be complex and constrained by factors relating to the language and culture of the sectors concerned. It is important to work towards a shared understanding of physical activity and a clear understanding of the goals and activities of all collaborating partners.

8. Ensure quality physical education is provided to all children in all schools, and ensure physical activity options are available to children and youth in the broader community.

Children and youth are a special target group for physical activity programs. There is a strong rationale for commencing primary prevention of cardiovascular and other chronic diseases at an early age.

Schools provide an important and convenient setting for reaching the vast majority of Australian children (aged 6–17 years). The school's environment and its interaction with parents, and community sport and recreation provide opportunities to maximise physical activity for children. In addition it is important to ensure that non-school settings such as local government and community groups give adequate priority to providing physical activity opportunities for children and youth.

9. Ensure equitable access to physical activity opportunities.

There are important and significant inequalities in health status in the Australian community, as outlined in this report for cardiovascular disease. It is important that physical activity programs give due attention to equality of access, opportunity and benefit. In keeping with this it is important to ensure that interventions target the most disadvantaged groups in the Australian community, and the most inactive. Physical activity interventions should also consider the needs of people of different cultures, ages, and with disabilities. The implications of geography, climate and remoteness on participation in physical activity should also be considered when designing interventions.

10. Advocate for due priority to be given to physical activity.

While there have been promising investments in a coordinated approach to physical activity through initiatives from the National Health and Medical Research Council and Active Australia, these are modest beginnings. Thus advocacy remains the priority strategy. Based on principles outlined in the nine recommendations above, government, non-government and commercial organisations promoting physical activity have a responsibility to advocate an increased focus on physical activity programs.

In conclusion, physical activity has been described as 'today's best buy in public health', and physical inactivity is recognised as a leading cardiovascular risk factor. Efforts to increase the levels of physical activity in the general community, as well as among those with heart disease are warranted as important strategies to reduce the burden of disease and costs associated with cardiovascular disease in Australia.

Further reading

- Armstrong T, Bauman A & Davies J 2000. Physical activity patterns of Australian adults. Results of the 1999 National Physical Activity Survey. Canberra: Australian Institute of Health and Welfare.
- Armstrong TP 1998. Monitoring trends in prevalence of physical activity in Australia (1989/90–1995). *Medicine and Science in Sports and Exercise* 30:5202.
- Bauman A & Egger 2000. The dawning of a new era for physical inactivity as a health risk factor. *Australian and New Zealand Journal of Medicine* 30(1):65–7.
- Bauman A & Owen N 1999. Physical activity of adult Australians: epidemiological evidence and potential strategies for health gain. *Journal of Science, Medicine and Sport* 2(1):30–41.
- Berlin J & Colditz GA 1990. A meta-analysis of physical activity in the prevention of coronary heart disease. *American Journal of Epidemiology* 132:612–28.
- Blair SN, Kohl HW, Paffenbarger RS, Clark DG, Cooper KH & Gibbons LW 1989. Physical fitness and all-cause mortality—a prospective study of healthy men and women. *The Journal of the American Medical Association* 262(17):2395–401.
- Booth M, Bauman A, Oldenburg B, Owen N & Magnus P 1992. Effects of a national mass media campaign on physical activity participation. *Health Promotion International* 7:241–7.
- Commonwealth Department of Health and Aged Care 1999. National physical activity guidelines for Australians (Poster). Canberra: DHAC.
- Craythorn E 1993. Inactivity and the environment report. Dubbo: Dubbo, Orana and Far West Region Health Promotion Unit.
- Donovan RJ & Owen N 1994. Social marketing and population interventions. In *Advances in exercise adherence* (RK Dishman, ed.). Champaign IL: Human Kinetics, 249–90.
- Dunn AL, Marcus BH, Kampert JB, Garcia ME, Kohl HW & Blair SN 1999. Comparison of lifestyle and structured interventions to increase physical activity and cardiorespiratory fitness: a randomised trial. *The Journal of the American Medical Association* 281(4):327–34.
- Fletcher GF, Balady G & Froelicher VF 1995. Exercise standards: a statement for healthcare professionals from the American Heart Association writing group. Office of Scientific Affairs, American Heart Association. *Circulation* 91(2):580–615.
- Holman CDJ 1996. Creating partnerships, building systems: improving interactions between research and practice. *Health Promotion Journal of Australia* 6(2):21–5.
- King A 1991. Community interventions for promotion of physical activity and fitness. *Exercise and Sports Sciences Reviews* 19:211–59.
- Marcus BH & Owen N 1992. Motivational readiness, self-efficacy and decision-making for exercise. *Journal of Applied Social Psychology* 22(1):3–16.
- Sallis JF, Haskell WL, Fortmann FP, Vranizan KM, Taylor CB & Soloman DS 1986. Predictors of adoption and maintenance of physical activity in a community sample. *Preventive Medicine* 15:331–41.
- Sallis JF & Owen N 1999. *Physical activity & behavioral medicine*. Thousand Oaks, CA: Sage Publications.
- Stephens T, Jacobs DR & White CC 1985. A descriptive epidemiology of leisure-time physical activity. *Public Health Reports* 100:147–58.
- Stone EJ, Mckenzie TL, Welk GJ & Booth ML 1998. Effects of physical activity interventions in youth: review and synthesis. *American Journal of Preventive Medicine* 15(4):298–315.
- United States Department of Health and Human Services 1996. *Physical activity and health: a report of the Surgeon General*. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion.
- World Health Organization 1986. *The Ottawa Charter for Health Promotion*. Geneva: WHO.
- Wright C, Atkinson R, Cox R, Dunn S & Ferguson K 1999. *Supportive environments for physical activity: guidelines for local government*. Adelaide: National Heart Foundation.
- Wright C, Atkinson R, MacDougall C & Booth B 1996. *Exercise in daily life: supportive environments*. Adelaide: National Heart Foundation.