

The Health Benefits of Physical Activity

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HIGHLIGHT

“It is clear that moderate levels of fitness offer considerable health benefits. The key is moving from the unfit category—some 30 to 40 million people in this country—to the moderately fit category. By beginning programs of moderate, regular exercise—half an hour each day, three times a week—anyone can join this group, and markedly lower their death rates from all-cause mortality, cancer, and cardiovascular disease.”

Dr. Steven Blair, The Cooper Institute for Aerobics Research

In 1990, *Healthy People 2000* was released by Dr. Louis Sullivan, Secretary, Department of Health and Human Services. The document elaborated national health promotion and disease prevention goals for the year 2000. A central goal of the document is to increase the span of healthy life for Americans. While improved treatment of disease to prevent premature death is an important concern, *Healthy People 2000* emphasizes the importance of prevention of illness/disease, especially lifestyle or chronic illnesses that have become the leading sources of death in our society. But perhaps most important of all, the goals focus on efforts to promote a quality of life and a sense of well-being associated with good health. Dr. Michael McGinnis, Director of the Office of Disease Prevention and Health Promotion, made the following statement.

...it is not through happenstance that the physical activity category is the first priority area of the *Healthy People 2000* effort. Physical activity is related to the health of all Americans. It has the ability to reduce directly the risk of several major chronic diseases as well as to catalyze positive changes with respect to other risk factors of these diseases. Dr. William Foege, former Director of the Centers for Disease Control, suggests that physical activity may provide the shortcut we in public health have been seeking for the control of chronic diseases, much like immunization has facilitated progress against infectious diseases (McGinnis, 1992, p. S196).

The inclusion of physical activity as an important lifestyle for promoting good health is now clear. But for those interested in the health benefits of physical activity, it is not easy to find a single source that summarizes these benefits. For this reason, we have attempted to provide a simple summary of the benefits in three sections: disease prevention and treatment; health promotion; and physical fitness development. Six principal sources are used for this summary. Readers are encouraged to consult these references and their sources for more complete details.

DISEASE PREVENTION AND TREATMENT

Prior to 1940, the leading killers in the United States were infectious diseases. Improvement in public health practices, implementation of personal and public health education, and vaccines have greatly reduced the incidence of these diseases. As indicated in the early statement by Dr. Foege, “chronic diseases” are now our major health concerns. These chronic diseases are often referred to as “lifestyle diseases” because changes in lifestyle, including increased activity and fitness, can reduce the threat of early death and the incidence of disease. Figure 6.1 lists several of the diseases for which regular physical activity can reduce risk, either of getting the disease or of dying from it. Also illustrated in Figure 6.1 are some of the possible reasons why exercise reduces risk of these diseases.

FIGURE 6.1

Physical activity and major lifestyle diseases.

Disease	Physical Activity Benefit
Heart Disease	<p>Healthy heart muscle</p> <ul style="list-style-type: none"> ■ lower resting heart rate ■ more blood pumped with each beat ■ reduced blood pressure in submaximal work <p>Healthy arteries</p> <ul style="list-style-type: none"> ■ less atherosclerosis (deposits in arteries) ■ higher HDL (“good” cholesterol) ■ better blood fat profile (fewer “bad” fats) ■ decreased platelet and less fibrin (related to atherosclerosis) ■ better blood flow <p>Better working capacity</p> <ul style="list-style-type: none"> ■ fewer demands during work ■ greater ability to meet work demands
Stroke	<p>Healthy arteries (see above)</p> <ul style="list-style-type: none"> ■ lower blood pressure
Peripheral Vascular Disease	<p>Improved working capacity</p> <p>Higher HDL</p> <p>Better blood fat profile</p>
High Blood Pressure	<p>Reduction in blood pressure among those with high levels</p> <p>Reduction in body fatness (associated with high blood pressure)</p>

Diabetes	Reduced body fatness (may relieve (non-insulin) symptoms of adult onset diabetes) Better carbohydrate metabolism (improved insulin sensitivity)
Cancer	Less risk of colon cancer (better transit time of food?)
Obesity	Increases lean body mass Decreases body fat percentage Less central fat distribution
Depression	Relief from some symptoms
Back Pain	Increased muscle strength and endurance Improved flexibility Improved posture
Osteoporosis	Greater bone density as a result of stressing long bones

In spite of the fact that deaths from heart disease have decreased in recent years, it is still the leading cause of death. Studies by Paffenbarger and colleagues (1989) as well as others have clearly shown that those who do regular physical activity are at less risk of dying from this major killer. Physically inactive people have almost twice the risk of developing heart disease as active people (Powell et al., 1987). In fact, the American Heart Association (Fletcher et al., 1992) has recently classified inactivity (sedentary living) as a primary risk factor for heart disease comparable to high blood pressure, high blood cholesterol, and cigarette smoking. Both stroke (lack of blood flow and oxygen to the brain) and peripheral vascular disease (lack of blood flow and oxygen to the limbs) have been shown (Haskell et al., 1992) to be associated with sedentary living for many of the same reasons why inactivity is related to heart disease (see Figure 6.1). High blood pressure or hypertension is a condition that predisposes people to other health risks such as heart disease and diabetes. Regular exercise has been shown to reduce blood pressure among those who have high levels though, by itself, exercise cannot normalize high blood pressure for most people (Haskell et al., 1992).

In the introduction of the Physical Activity and Fitness section of *Healthy People 2000* (Public Health Service, p. 94), it is noted that physical activity can help to prevent and manage non-insulin-dependent diabetes and osteoporosis. Recent evidence also has shown that inactive people have a higher incidence of colon and breast cancer than active people. While the evidence is less than complete, one researcher reached the following conclusion based on a review of recent research.

Given the consistency in the direction and magnitude of the findings regarding colon cancer...the evidence supports the conclusion that activity is protective against colon cancer. Although that protective effect may be small, the attributable risk of colon cancer associated with inactivity may be quite high given the prevalence of inactivity in Western societies. (Sternfeld, 1992, p. 1195)

It is generally conceded that regular muscle fitness and flexibility exercise can aid in improving posture. Together, exercise and good posture can have a positive effect on back problems as evidenced by less risk of back pain. In a recent review, Plowman (1992) noted that while we do not yet know the exact amounts of muscle strength, muscle endurance, and flexibility necessary to reduce the risk of back pain, there is support for the notion that poor scores on these fitness measures are predictive of low back pain.

The potential benefits of regular physical activity in reducing obesity are well documented. Regular exercise expends calories that can result in reduced fat storage in the body's fat cells. At the same time, exercise designed to build muscle fitness increases lean body tissue (muscle), which can result in a lesser relative percentage of fat in the body and a higher resting metabolism. Getting obese Americans to adopt regular exercise that would help them achieve normal levels of body fatness is not as successful as we might hope. Nevertheless, physical activity has great potential for reducing the incidence of obesity in our society (Epstein et al., 1990).

Depression is a major medical problem that causes much pain and suffering. The number of bed days and disabilities associated with depression is greater than that for the eight major chronic health conditions (Public Health Service, 1990). A recent position statement of the International Society of Sport Psychology (1992) states that studies on depressed patients reveal that aerobic exercises are as effective as different forms of psychotherapy. In addition, the Society summarizes by saying: "Exercise can have beneficial emotional effects across all ages and for both sexes."

HEALTH PROMOTION

The previous section dealt primarily with disease. Of course, disease treatment and prevention are critical to good health in our society. Nevertheless, it is widely acknowledged that optimal health is much more than freedom from disease. The challenge of *Healthy People 2000* (Public Health Service, 1990) illustrates this point.

The health of people is measured by more than death rates. Good health comes from reducing unnecessary suffering, illness, and disability. It comes as well from an improved quality of life. Health is thus best measured by citizens' sense of well-being. (p. 6)

Prevention of disease is a high priority and regular physical activity has been shown to help prevent the conditions discussed in the preceding sections. But what of high-quality living and a sense of well-being? Many of these are quite subjective. Corbin and Lindsey (1990) summarize some of the perceived benefits of exercise based on subjective feelings of people responding to national surveys. Some of the reported benefits are supported by scientific evidence, including a reduction in stress levels and in symptoms of depression (International Society of Sport Psychology, 1992), improved appearance, and increased working capacity. Other benefits such as improved sleep habits, greater ability to enjoy leisure, improved general sense of well-being, and improved self-esteem are less easy to document. Nevertheless, what people think is true influences their quality of life and the results of national opinion polls show that many Americans have positive feelings about the benefits they receive from regular exercise (Corbin and Lindsey, 1990). Among older adults, regular physical activity has been shown to increase independent functioning, increase the ability to drive a car, and improve social interactions (Corbin and Lindsey, 1990). There is similar evidence to show that physical activity can positively influence other health-related behaviors (Blair, 1985). One survey, for example, showed that regular exercisers were 50% more likely to quit smoking; 40% more likely to eat less red meat; 30% more likely to cut down on caffeine; 250% more likely to eat low calorie foods and drinks; 200% more likely to lose weight, and 25% more likely to cut down on salt and sugar than non-exercisers (Harris & Gurin, 1985).

Physical activity's contribution to quality of life and a personal sense of well-being is more difficult to document than its contribution to prevention and treatment of disease. In the long run, however, it may be equally important if the national goal of lengthening healthy life is to be achieved. It is doubtful that most Americans would favor an extended life if "quality of life" was lacking. The evidence suggests that humans were designed to be physically active and that physical activity has great potential for enhancing quality of life and sense of well-being. Additional research is necessary to determine the full extent of activity's contribution to these important variables.

PHYSICAL FITNESS

There is no doubt that regular physical activity builds physical fitness. What has become increasingly clear in recent years is that physical activity and physical fitness, as evidenced by performance on fitness tests, are independent but related phenomena. Likewise, physical fitness is associated with good health. For example, Blair et al. (1989) have shown that those with "good" levels of fitness have less heart disease risk than those with "low" levels of fitness. The previously cited review by Plowman (1992) suggests that muscle fitness is necessary to prevent back pain. Others have pointed out the importance of fitness to injury prevention (McGinnis, 1992). Body fatness, often considered a health-related component of physical fitness, is associated with medical problems of various kinds.

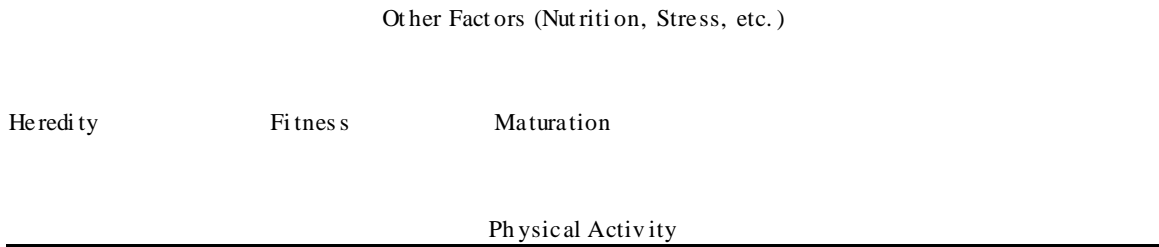
Fitness, as measured by fitness tests, is NOT solely related to regular physical activity. As noted in Figure 6.2, there are many other factors that contribute to physical fitness. Among children, fitness scores are influenced by chronological age and maturation (physiological age). In some cases, children and adolescents who are inactive have higher fitness scores than younger or more active peers (Pangrazi & Corbin, 1990; Pate, Dowda, & Ross, 1990). Bouchard and colleagues (1992) have demonstrated that heredity plays a significant role in a person's ability to improve fitness as a result of exercise. Some people respond to training more favorably than others, so it is possible that regular exercisers could sometimes have lower fitness performance levels than those who are sedentary. Of course, other factors such as nutrition, learned skills, and environment also play a role in fitness performances.

There is little doubt that good physical fitness is associated with reduced risk of disease. Further, it can be stated that good fitness helps people function effectively, look better, and have the ability to enjoy their free time. But evidence exists to support other important statements about physical fitness.

- Physical fitness, as measured by fitness tests, is not as meaningful to good health as physical fitness that results from regular physical activity as part of the normal lifestyle.
- Physical fitness, as measured by fitness tests, will ultimately improve as the result of regular exercise to the extent that hereditary predispositions allow. The amount and rate of change in fitness will take longer for some to achieve than for others.
- Physical fitness is associated with good health but is not the same as good health. Regular physical activity has positive benefits for both good health and adequate physical fitness.
- For good health benefits to result, it is important NOT to be in a low fit category. On the other hand, high levels of fitness test performance do NOT seem to be necessary for attaining health benefits. All people with regular physical activity have the potential to achieve adequate levels of fitness that are associated with good health.

FIGURE 6.2

Factors affecting physical fitness performances.



SUMMARY

In recent years, much has been learned about regular physical activity and physical fitness. Many of the health benefits of exercise and physical fitness are now well documented. Other potential benefits require much more research. In the meantime, the following quotes seem to best summarize our knowledge. From leading researchers Paffenbarger and Hyde (1980):

Evidence mounts that the relationship between exercise and good health is more than circumstantial. If some questions are not yet answered, they are far less important than those that have been.

From Edward Cooper during a news conference for the American Heart Association, July 1, 1992:

Now I'd like to say to those who are not engaged in "exercise training" that *any* physical activity is better than none. According to our panel, housework, gardening, shuffleboard—anything that causes us to move—is beneficial. Maybe you don't have time or ability to attain "cardiovascular fitness," that is, to enable your heart to function at its most efficient level...maybe you don't have the money to join a health club or buy a bicycle...still there are activities you can perform as a part of your daily life that will benefit your heart. I encourage you to make activity a part of your routine every day—just as much a part of your day as brushing your teeth or enjoying breakfast.

From John Dryden, spoken several hundred years ago, as cited by Paffenbarger and Hyde (1980):

Better to hunt in fields, for health unbought, than fee the doctor for nauseous draught; the wise, for cure, on exercise depend; God never made his work for man to mend.

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