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## Physical Fitness

Despite advances in medical research and practice, life expectancy in the United States is not changing much. Benefits of improved practice are being counterbalanced by effects of deleterious living patterns. Heart disease, the number one killer, is increasing. Contributing heavily are such controllable factors as sedentary living, obesity, and excessive cigarette smoking. The Framingham [Massachusetts] Study has identified many factors contributing to heart disease. In one of its contributions (1) it examined the role of physical activity. The most sedentary individuals had a mortality from coronary heart disease five times that of individuals who were active. Frank and his colleagues (2) in New York have studied coronary heart disease occurring in a defined population of 110,000 men and women. They have noted that the incidence of rapidly fatal myocardial infarction among sedentary individuals who are smokers is nine times the incidence among physically active non-smokers of similar age.

Physicians have long recommended physical fitness, including weight control, but the admonitions usually were not accompanied by realistic prescriptions. A physiological way to reduce weight is to eat a balanced diet representing a modest caloric deficit with respect to ordinary needs and to attain a substantial caloric deficit through exercise. By this means weight losses of 1 to 2 pounds a week can be achieved comfortably. Two recently issued paperback books (3, 4) give simple, effective programs of exercise for improving physical fitness. These books emphasize the great importance of conditioning the cardiovascular system. The value of isometrics is questioned, and calisthenics are assigned a secondary role.

The cost, in time and effort, of achieving fitness is small. Not more than an hour or two a week of effort is required, split among three or more occasions. In 16 weeks or less, sedentary individuals can note profound changes in their physical condition. For example, the resting pulse rate may be lowered from 85 to 65 beats per minute, and the time required to go a mile may be cut from 12 minutes to about 8.

Two cautionary bits of advice seem indicated. It is well to have a physical checkup before expanding one's activity. In the conditioning process one should "train, not strain." The programs begin with easy tasks—for example, 1 mile of walking—and then progress to more exacting efforts as fitness improves. The recommended means for maintaining fitness is jogging or running. However, other activities, such as cycling or swimming, also are effective. The relative benefits of the various forms of exercise are discussed by Cooper (4).

As one result of the conditioning process, the heart becomes much more efficient. Åstrand (5) has remarked that, by expending a "total of some 2,000 extra heart beats during a day's training, you save 10 to 30,000 beats over the remainder of the day."

An important potential benefit from physical fitness is an improvement in mental attitude. The typical middle-aged sedentary individual is in effect crawling submissively toward the grave. By investing an hour or two a week, he may add years to his useful life. He can become a better athlete than many who are 20 to 30 years younger. Buoyed by pride and a sense of well-being, he can compete more confidently in intellectual areas.—PHILIP H. ABELSON

1. W. B. Kannel, in *Proc. Int. Symp. Physical Activity and Cardiovascular Health, Toronto, 1966* (1967) [available from the Ontario Heart Foundation, 247 Davenport Rd., Toronto 5, Canada. \$3].
2. C. W. Frank, *J. Amer. Med. Ass.* **198**, 1241 (1966).
3. W. J. Bowerman and W. E. Harris, *Jogging* (Grosset & Dunlap, New York, 1967).
4. K. H. Cooper, *Aerobics* (Grosset & Dunlap, New York, 1968).
5. P. O. Åstrand, in *Proc. Int. Symp. Physical Activity and Cardiovascular Health, Toronto, 1966* (1967).