

Exercise: A Matter of Life or Death?

If a person died during exercise, he did not die from exercise.

—Ernst Jokl, sports medicine researcher

By JOEL GREENBERG



Wide World Photos

In the aftermath of the death of jogging enthusiast James Fixx while running, accumulating scientific evidence strongly suggests that exercise prolongs life

It was a fairly typical case history that might be heard at any sports medicine conference. A man began jogging in his late 30s and soon threw himself, body and soul, into the more serious world of the "runner." "This was not an 'elite' [world class] athlete," explains Noel Nequin, medical director of the Cardiac Rehabilitation and Health Enhancement Center at Swedish Covenant Hospital in Chicago. Nevertheless, the man, who ran a mile in 9 to 10 minutes, soon worked himself up to 40 to 60 miles per week and began entering marathons and "ultramarathons" (50- and 100-mile runs). By age 44, he had run in 25 marathons—running the 26-plus miles in an average of 3 hours and 35 minutes—several 50-mile runs and one 100-mile run (over 4 days).

In the summer of 1982, he began to have some chest discomfort during the first few minutes of running; the pain disappeared when he slowed to a walk and would not return after he restarted his run. But during subsequent runs, the pain returned and radiated to his jaw. No longer able to deny there was a problem, the man underwent a cardiologist's stress test, which revealed an abnormal electrocardiogram when the heart exceeded 150 beats per minute (while he was running on a treadmill). Follow-up examinations confirmed a 99 percent blockage in the man's right coronary artery.

The man underwent percutaneous coronary angioplasty—an alternative to a bypass operation—in which a balloon-tipped catheter is pushed into the artery; the balloon is then inflated several times to crush the plaque blocking the artery. In this case, the procedure decreased the blockage to 35 percent, leaving him with an "insignificant" blockage within the range experienced by many "healthy" people, according to Nequin.

Since the surgery, the runner has worked his way back up to 40 to 80 miles per week, without pain, and has resumed participation in marathons and ultramarathons, although his times are as slow as ever, Nequin jokes.

"I was the patient," Nequin revealed to a surprised audience of sports physicians in Eugene, Ore., at the recent Olympic Scientific Congress.

Nequin's presentation came just two days after running proponent James F. Fixx, 52, died of a heart attack while jogging in Vermont. The difference between Fixx and Nequin? "I'm one of the only one-third of people with heart disease who are blessed with symptoms," says Nequin. Fixx was not—or, if he was, he apparently didn't let anyone know about it; an autopsy revealed massive blockage in several of the arteries leading to his heart.

Fixx was mourned both on a personal level and as a symbol and guru for the "average" runner; for many, he provided inspiration to run not as a competitor but as a way to keep fit and live longer. For this reason, the ironic circumstances of his death cut deeply into those who are convinced that exercise is beneficial. "If it had to happen, why couldn't it have been while he was at a restaurant or sleeping?" one physician at the conference asked with a touch of black humor.

"Exercise can trigger, but not cause," a fatal heart attack, says Ernst Jokl, clinical professor of neurology and sports medicine at the University of Kentucky Medical Center in Lexington. Indeed, says Jokl, who has studied death among athletes for several decades, "A fatal collapse during exercise may represent the first manifestation of cardiac disease." The triggers, he writes in the current *ANNALS OF SPORTS MEDICINE* (Vol. 1, No. 4), can include infection, trauma to the chest and thermic stress, usually in the form of hyperthermia, or overheating.

Jokl, Nequin and other sports physicians attending the Olympic Scientific Congress almost universally subscribe to the belief that exercise is beneficial to a person's health. While they admit that the number of heart attacks during road races has increased, Jokl says that this is simply because "many more people run." Some of them are at high risk for, or already have, heart disease, he adds, "but you can't subject the whole population to a checkup. The same people who die [during exercise] would probably die three weeks later in bed," he told *SCIENCE NEWS*.

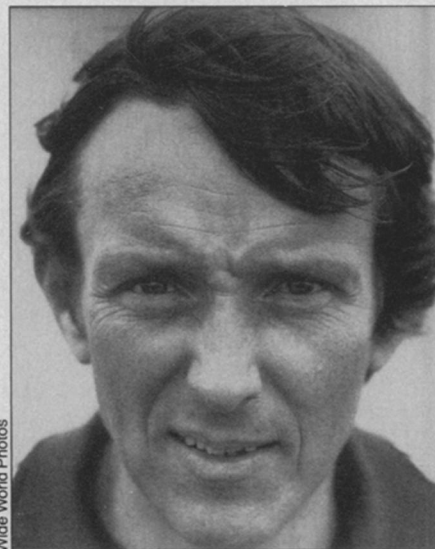
Nequin concedes that the sudden deaths of Fixx and others dispel the myth that running fosters "immunity from heart disease." However, he cites a recent study of 30 cardiac rehabilitation units in the United States and Canada that reports the incidence of heart attack during exercise is "the same or less" than that occurring in the general population "while crossing the



Wide World Photos

"Elite" athletes, such as hurdler Greg Foster and runner Mary Decker (opposite page), are superb physical specimens and face almost no risk of heart-related sudden death while performing, according to sports scientists.

street, lying in bed or driving a car," he says. "Indeed, the primary mode of therapy for people who have heart disease or have had a heart attack is exercise," he adds, "and there is evidence of lower heart attack rates" among some runners. "Exercise definitely helps," Nequin says, "rather than hurts."



Wide World Photos

This belief is supported emphatically by a series of studies reported in the July 27 *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* (JAMA). The research, which taken together involved the study of more than 20,000 people, concludes that regular, moderate exercise can prolong life, by lowering the risk for heart disease, high blood pressure and other health problems.

In one study by scientists at Stanford and Harvard universities and the Marathon Oil Co. in Findlay, Ohio, exercise was the single most important predictor of heart disease incidence among the 16,936 Harvard alumni studied. Those who exercised with regularity after graduation—regardless of whether or not they were athletic during their college years (alumni from 1962 to 1972 were studied)—had a low risk for coronary heart disease. Those alumni who were sedentary—even ex-varsity athletes—showed a high risk.

"Exercise benefit is independent of contrary lifestyle elements—smoking, obesity, weight gain, hypertension and adverse parental disease history—in affecting coronary heart disease incidence," write the researchers, headed by Ralph J. Paffenbarger Jr. of Harvard and Stanford. But, they add, "physical exercise level... has direct influence on... reducing the desire to smoke, favoring reduction or avoidance of obesity, helping to control blood pressure, countering dietary impulses and psychological stresses and inducing alteration of unfavorable environment or family cir-

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Courtesy, Nequin

The difference between Jim Fixx (far left) and Noel Nequin (shown "ultramarathoning") may have been that Nequin was one of the "lucky ones" warned by chest pain while running. Fixx either had no such symptoms or chose to ignore or deny them, a behavior common among heart disease victims, according to cardiologists.

that typically use large quantities of plastic items. For instance, trash from fast-food restaurants or from airlines often contains a high proportion of polyethylene and polystyrene. Japan is one of the few countries that actually make an effort to get householders to separate plastics by hand from other materials before the garbage is collected.

The development of plastics recycling in the United States may also be threatened by programs designed to generate heat or power from burning garbage. These incinerators provide local governments an attractive way of getting rid of their garbage while earning revenue from the sale of generated power. To ensure a steady fuel supply for their incinerators, many municipalities now require all solid waste, including paper and plastic scrap, to go to the plants.

This trend already worries the paper recycling industry and may become a problem for companies interested in developing uses for recycled plastic. Without a reliable source of supply, few companies would want to take the risk of getting into the recycling business. Recent research at the Plastics Institute, paralleling studies by paper recyclers, shows that more energy can be saved through recycling than is gained by burning plastic scrap.

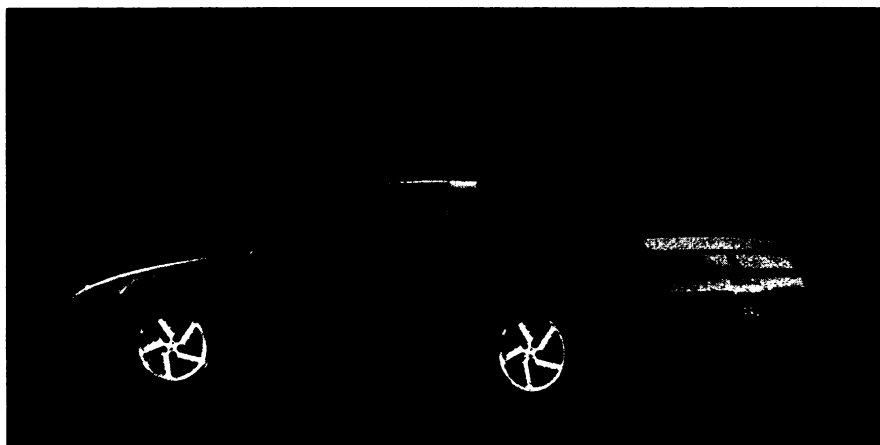
Another problem facing recyclers generally is that products are rarely designed and manufactured with recycling in mind. Automobile manufacturers, for example,

use a mix of many different polymers in their vehicles. A few cars, like the new Renault Espace, Pontiac Fiero and a recently announced Honda sports car, even feature bodywork made from polymers. To make recycling easier, Michael B. Bever of the Massachusetts Institute of Technology suggests the possibility of making at least the entire interior of a car from essentially one kind of polymer treated in different ways for its various applications.

"That would make our lives so much easier," says Spaak, "but I don't think it's a possibility." Too many automobile parts require particular properties that can't be met by one type of plastic, he says. However, Spaak doesn't discount the

possibility of future large-scale production of small, electric-driven vehicles molded from plastic. This much plastic shouldn't be thrown away without an effort made to recycle the material, he says.

In general, the value of plastic materials that can be remelted and reused has not been fully realized, says Spaak. "Scrap plastics should be recycled as a material resource." Plastic producers already recycle most of their own scrap. Treating the plastic in automobile-shredder scrap is a first step toward recycling the plastics that get to consumers and are usually thrown away. Someday, the term "plastic" may no longer be synonymous with the word "disposable." □



Pontiac Fiero with polymer bodywork

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cumstances." The reduced mortality levels they observed among exercisers, the researchers conclude, "should imply increased life expectancy for the active men."

"The types and amount of exercise likely to achieve optimum cardiovascular health are uncertain," the researchers write. However, they do mention the importance of "constancy of habit," whether the activity be walking, climbing or "regular sports play."

A second study of some 6,000 men and women, aged 20 to 65 — also published in that issue of JAMA — reports that persons with "low levels of physical fitness" are about 50 percent more likely to develop hypertension than are "highly fit persons." In an accompanying editorial, Norman M. Kaplan of the University of Texas Health Center in Dallas says the study "provides some very suggestive evidence that physical fitness provides protection against the development of hypertension ... Like my mother's chicken soup, regular isotonic exercise should not hurt," Kaplan says. "Who knows, joggers may even live longer."

Though he did not specify chicken soup, cardiologist/marathoner Nequin says that since his operation and recovery, he eats "anything I can get my hands on," adding quickly that he watches his cholesterol and fat intake. But, he emphasizes, there are "no guarantees" against heart disease,

particularly in cases where there is a family history of heart problems.

Jokl concurs. "The most important thing is to pick the right parents," he says. "Exercise cannot remove plaques in the coronary arteries, nor scars in the myocardium." Still, Jokl notes that physicians' thinking about exercise and health has shifted about 180 degrees since around the turn of the century. Published reports and lectures around that time warned of the "ill effects of exercise," primarily upon the hearts of adolescents. Such thinking prevailed for several decades into this century, and it has been "only recently," Jokl says, that "the resources of scientific medicine were...brought to bear upon the study of the problem of heart and sport. Many current athletic records have been established by adolescent boys and girls," Jokl writes in the ANNALS OF SPORTS MEDICINE. "There can be no doubt that the medical prophets of doom ... possessed more eloquence than knowledge."

Part of the previous concern involved the "enlarged heart" of many athletes. Now, after more than 10 years of study, "cardiologists have new information that the large heart of athletes is not the same as a diseased enlarged heart," Jokl says. The growth of the athlete's heart — primarily seen in those participating in endurance sports such as distance running — is "adaptive, to facilitate exercise," he says. Moreover, he adds, such growth is "reversible":

If the athlete refrains from exercise for a period of time, the heart—which can weigh up to 500 grams in the endurance athlete—will return to its smaller dimensions.

Finally, Jokl notes that sudden cardiac death during exercise "never happens to an elite [Olympic or world class caliber] athlete." Such performers, he says, are almost always in superior physical condition, and had to be that way to achieve their position in the upper echelons of athletics.

But the rest of the population, like Nequin, should heed any symptoms that might arise during exercise. "Denial is very typical," Nequin says. "Even people who have had an actual heart attack generally delay about three hours before going to a doctor. Being a physician helped—I had an idea I had a problem, but I still waited until there was no choice but to go in [to see a doctor]."

The denial is usually followed by the emotional depression of accepting that you have heart disease, he says. "But that only lasted until my cardiologist took me out to dinner ... and paid.

"I feel luckier than most people," Nequin says. "Now I know my problem and exercise to the limits of my problem. It is ironic that I run a cardiac rehabilitation program and that this happened to me."

The coincidence, he concedes, is not dissimilar to that surrounding Fixx's death. "Jim Fixx," Nequin told his audience, "could have been giving this lecture." □