

# Aerobics: A Rational Analysis

By Fred Hahn

Statistics confirm that millions of people injure themselves each year while performing aerobic-type activities. Although physical benefits are obtained by being active as opposed to sedentary, over the past few decades, the number of people who have sustained physical injuries in their pursuit of physical health has reached *epidemic* proportions. Though this sounds extreme, it is true.

The following paper is designed to give a broader perspective -- a rational analysis -- on the issue of aerobics. Several books written by physicians as well as my own observations and experience spanning over a decade in this field make a sound argument questioning the use of aerobic activity (exceptions aside) as the best tool to improve upon our physical health. This is not to say that I am against physical activity - quite the contrary. For many, physical activity improves a sense of well being and adds enjoyment to life. However, for just as many, it does not. For some, physical activity is not a means to peace of mind. In either case, it is clearly a preference.

It is the use of aerobics to make a person physically "healthier," not happier, that I take issue with. I know at least a dozen or more people who suffer from permanent joint damage and a few who have died as a result of aerobic activity. Like a medication, if one is equally beneficial as another but has less or no side effects, it would be illogical to use the medicine that harms while helping when the better choice is available. Luckily for us, when it comes to exercise we have a choice.

Realize that the benefits caused by physical activity are obtained only by the sedentary. A typical city dweller who's daily lifestyle includes climbing up and down several flights of subway steps, walking to the grocery store, running for a bus, etc. more than satisfies the American College of Sports Medicine's recommendation for the minimum amount of daily physical activity necessary for health. Bicycle messengers, construction workers, fishermen, etc. are all far more active than the ACSM recommends - and many of them are unfit, over fat and unhealthy. Regardless, there are many physical benefits that daily physical activity, even rigorous aerobics does *not* provide - benefits that are far more important to the typical adult than being an endurance athlete.

Recent research evaluated and approved by the American Heart Association indicates that strength training improves all of the health risk factors *that are checked by a physician at a physical exam* (e.g., cholesterol, blood pressure, body fat, insulin sensitivity (diabetics), bone density (women) and more. Strength training will not, however, improve aerobic conditioning for a high level of aerobic performance, e.g., distance running, cycling, climbing, etc. But the typical person should not be concerned with this kind of athletic prowess.

Studies conducted by the Cooper Institute of Aerobics confirm that once a below average to average level of treadmill walking endurance is reached, no further benefits to mortality are forthcoming. Studies conducted by Blair, Ades, et al indicate that strength training improves treadmill walking endurance statistically significantly. It's not hard to understand why. In a sense, muscles are the 'engines' of our body. The stronger they become, the better able they are to do anything involving physical work be it treadmill walking or more "real" events such as climbing stairs, carrying groceries, running to catch a bus, etc.

There is no scientific evidence to suggest that people who are either physically active by nature and/or are engaged in a proper strength program, need additional aerobic exercise. Furthermore, strength training offers more benefits that are important and immediately available to the typical person than aerobics - all without the insult to the body. *Consider this is the main point of this paper.*

### **Where did the concept of Aerobics Fitness come from?**

By and large, "aerobics" is a catchword coined in the 1960's by a physician named Kenneth Cooper, founder of the Cooper Institute of Aerobics. (Strange that there is no such place as the Smith Institute of Strength. I wonder why.) Dr. Cooper is largely responsible for creating the running "craze" of the 70's. Interestingly enough, Dr. Cooper admitted in a New York Times article titled *The Fit Commandment* (Wednesday, July 15, 1995) that, though in 1968 he believed that a high level of aerobic fitness was a requirement for a long and healthy life, he now believes that "people do not need to be aerobically fit to be healthy." One would think that Dr. Cooper's statement would have the fitness industry questioning the need for aerobics altogether as a health-enhancing activity since aerobics causes so many to suffer from orthopedic maladies. However, aerobics are/is so ingrained into our societal thinking and make so many companies a healthy profit (including the Cooper Institute for Aerobics and the American College of Sports Medicine), aerobics continues to be endorsed, popularized and sold as the foundation of an exercise program. "Just do it" as it were.

Consider the following medical opinions (the italicized areas are my doing for later emphasis):

“When patients participate in exercise programs, they often assume that their heart becomes stronger. This is not the case. Physical training results in a sense of well-being because of other effects &dash; *it improves the efficiency of the muscles* — it improves the hormonal tone of the body — it improves the control of sugar in people with diabetes. However, exercise will not make the heart beat more strongly.”

Bruce D. Charash, MD, Cardiologist  
(From his book Heart Myths, 1991)

“You might suspect from the emphasis on cardiopulmonary fitness that the major effect of training is on the heart and lungs. Guess again. Exercise does nothing for the lungs that has been

amply proved...Nor does it especially benefit your heart. Running, no matter what you have been told, primarily trains and conditions the muscles.”

George Sheehan, MD, Cardiologist  
(Known as the "Guru" of running. He has authored several books on running for fitness.)

“Most of the improvement in functional capacity due to exercise is not even directly related to the heart. It is due to an effect on the peripheral muscle cells whereby they more efficiently extract oxygen from the blood.”

Henry Solomon, MD Cardiologist  
(From his book *The Exercise Myth*, 1987)

Look at these quotes again and reread the italicized areas. You'll see that the common denominator these cardiologists all agree upon is the effect activity has on the skeletal muscles.

## **Muscle: A Highly Active Tissue**

Muscle tissue is always at "work" even when we are at rest. As each of us must eat to sustain ourselves, so too must muscle tissue "eat" to survive. Put simply, muscles utilize or feed on two substances, oxygen (air) and glucose (sugar), provided by the blood, in order to "live." (Fats are also used as fuel as well.) They utilize differing amounts of each to meet whatever demands are being placed upon them by us. When muscles are *predominantly* using oxygen as fuel, the body is said to be working *aerobically* (with oxygen). When muscles are *predominantly* using sugar as fuel, the body is said to be working *anaerobically* (without oxygen). However, regardless of which "pathway" is being used more, both are always functioning simultaneously. In other words, there is no such thing as *pure* aerobic work or *pure* anaerobic work with respect to the human metabolism.

## **Heart Rate - A Myth?**

A low resting heart rate (roughly 45-65 BPM) is considered to be a determinant of whether someone is cardiovascularly "fit," meaning healthy. But heart rate alone does not give a complete picture of a person's cardiovascular *health*. The heart is obviously an extremely important *muscle*. But our heart is also an *involuntary organ*. It is a perpetual pump that propels oxygenated blood throughout our body without our conscious thought. It is, in a sense, an electronic slave whose taskmaster is the skeletal muscles. If a person's heart rate is normal upon a physical exam, the physician is pleased. Never would he suggest to a patient to get it lower. While it is true that strength training is not known to lower *resting* heart rate, what strength training does do is the opposite. It keeps the heart rate from getting very high when involved in daily activity. Can stronger muscles actually aid in improving our ability to perform aerobic activities without lowering our resting heart rate? Absolutely.

Consider the following examples:

**Example #1:** Riding a bicycle uphill can be a difficult task for one person, yet simple for another. Even if both people are pedaling up the same hill, with the same bike, in the same gear, at the same pace, with the same seat height, have the exact same mental desire, limb length, resting heart rate, resting blood pressure, ejection fraction, stroke volume, cholesterol level, VO<sub>2</sub> capacity and body fat percentage. The act of riding a bike uphill, in and of itself, is neither an *aerobic* or *anaerobic* activity. The pathway that is being used most, be it aerobic or anaerobic, depends to a large degree upon muscular strength, not only on the strength or health of the heart. The person with stronger muscles will propel up the hill easier than will the weaker individual regardless of the heart. As doctor Solomon points out, it is entirely possible for a person to have a resting rate of 60 bpm, be able to perform feats of exceptional fitness, yet be riddled with severe coronary artery disease.

**Example # 2:** A woman has difficulty walking up a flight of steps that leads to her home. Each day as she reaches the top step, she is completely out of breath. Taking pity on her, her fairy godmother swoops down taps her on the thighs and buttocks with her magic muscle wand, and *viola!* The woman's muscular strength increases by 50%. Feeling this, the woman immediately decides to "test drive" her new muscles. She walks up the steps again at the same pace and lo-and-behold, she reaches the top without the slightest problem. (Studies conducted by Drs. Westcott, Darden, Nelson, Ades, Hurley et. al., have shown that increased muscular strength improves day-to-day functional ability and aerobic endurance.) How is this possible? The fairy godmother didn't tap her heart and lungs with a magic aerobic wand. The actual condition or health of the woman's heart and lungs remained *exactly the same*. Because of the increased strength, her heart did not have to work as hard the second time around.

### **Aren't Aerobics good for a "bad" heart?**

A doctor will usually judge vascular health from an EKG test during a routine physical. If the EKG is abnormal, the patient might be sent to the cardiologist for further testing. This testing usually includes a sub-maximal stress test that checks the "behavior" of the hearts function. Ejection fraction, stroke volume and perhaps VO<sub>2</sub> max will also be tested. (Simply put, stroke volume refers to the amount of blood pumped from the left ventricle in a single beat. Ejection fraction refers to the total *percentage* of the total volume of blood in the ventricle that is actually ejected. VO<sub>2</sub> is an estimate of the volume of oxygen used by the body per minute of exercise.) This test, however, is almost always performed without considering the person's level of skeletal muscular strength, which can greatly influence the outcome. *Supposedly*, improving each of these factors via aerobic exercise results in a healthier vascular system. This is not *necessarily* so. From Dr. Charash's book:

“In fact, the reverse was demonstrated in a scientific study that examined men who joined an exercise program within fifteen weeks of experiencing a heart attack. The heart muscle actually became weaker in these men...”

There are other factors that determine the actual health and strength of a person's cardiovascular system as well. There is the actual size of the heart, size of its inner chambers, condition of its valves, diameter of the arteries and veins, magnitude of lung capacity, efficiency of the electrical system, etc., most of which are genetically inherited. These factors are rarely ever considered during fitness assessments and even when they are considered are nearly impossible to accurately measure. Stroke volume, ejection fraction, VO2 max, resting heart rate and blood pressure assessments are, without question, useful to physicians as indicators of a possible heart problem when symptoms arise, but they do not conclusively determine superior or inferior cardiovascular health.

### **Aren't Athletes Healthier than us?**

While many endurance athletes have lower than normal resting heart rates, superior stroke volumes and higher VO2 maxs, many still contract and die from heart and vascular disease. So the answer is no. Being an athlete does not guarantee better or superior health. In fact, it is entirely possible for a "un-fit," sedentary individual to have a healthier heart and vascular system than the world's greatest marathon runner. To quote Dr. Solomon:

“Somehow the notion mistakenly arose that these physiological changes of the training effect are automatically "healthier" or "better." But there is no evidence that a slower resting heart rate is healthier than a heart rate somewhat faster, or that a quicker return to a resting heart rate after exercise is inherently beneficial. Nobody has ever shown any biological advantage to a slower heartbeat.”

“Not only is superb physical performance possible in the presence of severe coronary heart disease, but also the person may himself not feel the symptoms. I know patients of exceptional fitness who have severe coronary artery disease. Even people with imminently fatal heart disease can play sports, exercise and run. They may have no symptoms and may be capable of outstanding physical performance with hearts that will kill them.”

Remember the famous runner Jim Fixx? Fit as he was, he died of a heart attack. Why? Obviously he had an unknown, pre-existing, imminently fatal heart condition - a condition that running couldn't rectify. But did his heart condition at least slow in advancement because Mr. Fixx was so fit or did running exacerbate his condition and cause his premature death? It's hard to say. But think of this. Had his doctor given him an exam and discovered his heart disease, he would have strongly urged Mr. Fixx not to run anymore - or *else*. Considering this, why then do professionals use aerobics for cardiac rehabilitation?

### **The Harvard "Study"**

A 17 year survey conducted by Harvard University in the 1990's revealed that alumni who were very physically active lived approximately two years longer than those who were less active

suggesting that being more active will increase longevity. However, the activity was not necessarily the reason for the extended life span of the alumni. The study compared people who *chose* to be active with people who *chose not* to. The extended life span could just as well been due to the fact that, since healthier people are usually more apt to be more active, the people who chose not to be active already had disease feeling to poorly to exercise. (Bear in mind that in order to reap the couple of extra years of life, a person would have to spend half the extended life span doing the exercising!) Epidemiological surveys such as the Harvard Study suggest an *association*. However, they do not determine cause and effect. Example: Sweden, for example, has a much lower percentage of citizens with heart disease than America. The Swedes are, on average, much taller than we are. This does not mean that, the taller you are, the less chance you will have of contracting heart disease!

### **Fitness vs. Health**

The confusion between fitness and health is why many mistakenly consider cardiovascular fitness to be a general health condition. Statistics show elite athletes contract heart and vascular disease almost at the same rate as unfit folks. Since many unfit folks are free of heart disease and live to be quite old, aerobic "fitness" then is just a *specific* physiological adaptation that does not necessarily guarantee improved vascular health or increased longevity. What it does guarantee, sooner or later, is an orthopedic injury. (Why do you think that almost every pain-reliever commercial these days uses an aching athlete as an example of why you need their product?)

### **A Practical Approach**

To enhance your health through exercise safely and most effectively, start a proper strength-training program. (Visit [www.ExerciseStandards.org](http://www.ExerciseStandards.org) for facilities and instructors we recommend.) Doing so will provide all of the necessary health benefits you need to live a long and healthy life without putting your body at unnecessary risk. In this way, if you become interested in being physically active for recreational purposes, you can put your strong, injury resilient body to the task, increasing the enjoyment and finesse of the activity. If you do not like physical activity, you needn't feel guilty. As far as the health issues your doctor is concerned about during a routine physical exam, strength training improves them all - and more.

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