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Exercise and Your Heart Part I

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Your Life Your Health

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Most people probably imagine that if someone lives to a very great age, he (or, more likely, she) will be at ever-increasing risk of having his or her heart simply wear out. Actually, that's highly unlikely. Your heart, for all practical purposes, doesn't wear out. The estimated theoretical age limit for human beings -- the age beyond which the body ceases to be able to repair itself effectively -- is about 115 years. There's no reason to think the heart wouldn't still be beating strongly at that age, barring disease or injury.

Over a normal life span, it will pump more than two billion gallons of blood at the rate of about a gallon every five beats. No other muscle in the body comes close to that level of tireless effort. As you can imagine, this pump uses a lot of energy, requiring a greater proportion of the blood stream's oxygen and food supply than any comparable muscle mass in the body. That blood supply is provided by its own system of arteries, which tap directly into the aorta -- the huge, arched artery that exits the top of the heart's main pumping chamber and carries blood downward to the torso and legs. The arteries encircle the heart somewhat like a crown -- hence their name: "coronary" arteries.

Those arteries are the heart's Achilles' heel. Atherosclerosis -- blockage of the coronary arteries by buildups of cholesterol plaque -- can ultimately become so severe that the heart muscle tissue below the blockage begins to die from lack of oxygen. That's a heart attack, the nation's leading killer.

Some patients have asked why aerobic exercise -- walking, jogging, swimming, etc. -- doesn't shorten the lives of those who undertake them by increasing the heartbeat significantly. That assumes your heart is good for only so many contractions before wearing out. On the contrary, such exercise actually strengthens the heart, raises its pumping efficiency and slows the accumulation of atherosclerotic plaque.

So don't worry about your heart someday "giving out" on you. Unless it falls victim to atherosclerosis, infection or injury, you're far more likely to give out on it!

Fitness: What is it?

Fitness is a combination of body composition, muscular performance, and cardiovascular fitness with the later being one of the most important components. Improving cardiovascular function increases your supply of oxygen and energy to your body. It also decreases your risk of heart disease, stroke, high blood pressure, and other life threatening diseases. Cardiovascular fitness can lead to prolonged endurance and will help you perform to your best abilities. When a heart is well conditioned, it is like any other muscle - it becomes stronger and more efficient. A normal heart beats at

approximately 70 beats per minute at rest, but a conditioned heart can beat as few as 40 beats per minute. As you can see a healthy heart has to work half as much to get the same amount of oxygen to your body.

Aerobic

Aerobic means “with oxygen.” Aerobic exercise which involves steady constant motion of the muscles increases the body's demand for oxygen. In this manner aerobic exercise works your heart muscle making it bigger and stronger. Examples of aerobic exercises are walking, running, swimming, and cycling. While you want the exercise to be intensive you don't want to overdo it. The best way to monitor the amount of work you are doing is to measure your heart beat. A target heart range (THR) for you is 60-80% of 220 minus your age. (220 minus your age gives you your predicted maximum heart rate. It is possible to measure your maximum heart rate with a cardiopulmonary exercise test which can be performed at SETMA.) When exercising take your heart beat frequently and increase your exercise to reach your target heart range, but if you start to exceed it, slow down. At the beginning aim for the low end of your target heart range and as you become more fit, gradually work into the higher range. Exercising for 20-30 minutes three times a week will help you to become more fit.

To increase your physical activity doesn't always mean going to the gym. Try putting it into your daily routine. If you do this, you are more likely to keep doing it because you don't have to go out of your way to exercise. Some tips to improve your physical activity:

- Park your car at the far end of the aisle and walk. We battle for the closest parking places, but in reality those who get ones far away are getting the biggest prize.
- At the malls, try entering the mall away from your destination you wish to visit or make a habit of walking the mall before you begin shopping (its a good way to check out who is having sales).
- Take stairs whenever possible - particularly if you are going four floors or less. Even if you work on the 60th floor, try climbing a few flights and then taking the elevator just shy of your floor and walk the rest of the way.
- Hand deliver messages rather than using the phone, interoffice or e-mail.
- Wash your own car on good days instead of the car wash.
- Take your dog for a walk
- Don't use the remote control, get up and change the T.V. channel.

Your Body's Response to Exercise

What do you notice happening to your body when you exercise? The list would probably go something like this:

- Your heart beats faster
- You breathe more deeply and more frequently
- You sweat and feel hotter
- You feel thirsty

- You change "color" - your skin becoming "flushed"
- You can feel your pulse beating
- Your muscles may begin to ache
- You may feel light headed and not as mentally alert

Obviously the body is trying to tell you something. There has to be a purpose to these changes or else the body would not bother. It is saying "if you are going to be doing this, I need extra oxygen."

Your heart is a muscle and its function is to pump blood around your body. Blood is the transport system for your body and carries the fuel and nutrients your body requires. Your heart is approximately the size of a clenched fist and weighs about 300grams. It also holds about 70 milliliters of blood (4.5 tablespoons) or about 1ml for every kilogram of your body weight. At rest your heart rate averages about 72 beats per minute so the amount of blood being pumped around your body each minute is $70 \times 72 = 5$ liters (about 5 gallons).

During moderate exercise, such as steady running during a game, your heart will respond to the increased demands for resources by slightly enlarging, thus allowing more blood to enter your heart, and by increasing the number of beats per minute. This allows more blood to be pumped around your body, i.e., $80 \times 130 = 10.4$ liters. As the intensity of your exercise increases, e.g., you have to sprint, heart rate increases still further so more blood can be circulated e.g. $80 \times 170 = 13.6$ liters.

Myths About Exercise

Myth 1. Exercising makes you tired.

As they become more physically fit, most people feel physical activity gives them even more energy than before. Regular, moderate-to-brisk exercise can also help you reduce fatigue and manage stress.

Myth 2. Exercising takes too much time.

It only takes a few minutes a day to become more physically active. To condition your heart and lungs, regular exercise does not have to take more than about 30 to 60 minutes, three or four times a week. If you don't have 30 minutes in your schedule for an exercise break, try to find two 15-minute periods or even three 10-minute periods. Once you discover how much you enjoy these exercise breaks, you may want to make them a habit! Then physical activity becomes a natural part of your life.

Myth 3. All exercises give you the same benefits.

All physical activities can give you enjoyment. Low-intensity activities - if performed daily - also can have some long-term health benefits and lower your risk of heart disease. But only regular, brisk and sustained exercises such as brisk walking, jogging or

swimming improve the efficiency of your heart and lungs and burn off substantial extra calories. Other activities may give you other benefits such as increased flexibility or muscle strength, depending on the type of activity.

Myth 4. The older you are, the less exercise you need.

We tend to become less active with age, and therefore need to make sure we are getting enough physical activity. In general, middle-aged and older people benefit from regular physical activity just as young people do. Age need not be a limitation. In fact, regular physical activity in older persons increases their capacity to perform activities of daily living. What is important, no matter what your age, is tailoring the activity program to your own fitness level.

Myth 5. You have to be athletic to exercise.

Most physical activities do not require any special athletic skills. In fact, many people who found school sports difficult have discovered that these other activities are easy to do and enjoy. A perfect example is walking - an activity that requires no special talent, athletic ability or equipment.

Exercises which help your heart

The columns below describe three types of activities and how they affect your heart.

Column A - These vigorous exercises are especially helpful when done regularly. To condition your heart and lungs, the American Heart Association recommends that you do them for at least 30 minutes, three or four times a week, at more than 50 percent of your exercise capacity. Other health experts suggest a shorter period for higher-intensity activities. These exercises can also burn up more calories than those that are not so vigorous.

Column B - These activities are moderately vigorous but still excellent choices. When done briskly for 30 minutes or longer, three or four times a week, they can also condition your heart and lungs.

Column C - These activities are not vigorous or sustained. They still have benefits - they can be enjoyable, improve coordination and muscle tone, relieve tension, and also help burn up some calories.

These and other low-intensity activities - like gardening, yard- work, housework, dancing and home exercise - can help lower your risk of heart disease if done daily.

A Do condition heart and lungs	B Can condition heart and lungs	C Do not condition much
Aerobic Dancing	Downhill Skiing	Badminton
Bicycling	Basketball	Baseball
Cross-Country Skiing	Field Hockey	Bowling
Hiking (uphill)	Calisthenics	Croquet
Ice Hockey	Handball	Football
Jogging	Racquetball	Gardening
Jumping Rope	Soccer	Golf (on foot or by cart)
Rowing	Squash	Housework
Running in Place	Tennis (singles)	Ping-pong
Stair-climbing	Volleyball	Shuffleboard
Stationary Cycling	Walking Moderately	Social Dancing
Swimming		Softball
Walking Briskly		Walking Leisurely

Next week, we will examine more information about how to keep your heart health by increasing its work load. Remember, it is your life and it is your health.