

Keeping your heart healthy

By Gary F. Arnet, D.D.S.

“I’m sorry, Doctor Arnet, but you must have immediate cardiac bypass surgery. Your coronary arteries are 95% blocked.”

“That can’t be, doctor,” I replied. “I am only 38, I have no symptoms, I exercise, and I don’t smoke. Besides I have patients to see, young children to care for, and have to provide for my family.”

“I’m sorry. We will do the surgery Thursday. Get your affairs in order because you will be off work 12 weeks,” he answered.

Your life stands still when you get the news that you need cardiac bypass surgery. As I found out, all of the important things on your “to do” list don’t matter anymore. The places you need to go, the people you need to meet with, your family activities, your job, all of these things no longer are important. You are in a struggle for your life. While a safe, routine operation today, devastating or fatal complications can still occur and there is a long recovery period.

Whether you are 38 or 75 years, all sorts of worries go through your mind. You wonder how your family is going to manage while you are recovering, how you will pay your bills, what will happen to your job, and what will happen if you have a stroke or die during surgery. What type of lifestyle changes will you need to make afterwards? How will you learn about these? If you live by yourself, who is going to take care of you while you are recovering? You think about all the ways heart surgery will affect your life.

My oldest child was in second grade and my two youngest were in pre-school when I had heart surgery. I worried about how would my wife take care of them if something happened. Would they even remember me if I died? Heart surgery was certainly not something I wanted to deal with.



Author and his sons while hiking on a 90-mile backpacking trip that reached elevations of 12,000 feet. This trip was taken 10 years after author’s cardiac bypass surgery.

Yet, I was one of the lucky ones. For many people with heart disease, their first symptom is death. They have no warning until they collapse one day and die.

Heart disease is the leading cause of death in the United States. About 1.5 million Americans have a heart attack each year and about 500,000 of them die. About 2 million men are estimated to have significant coronary artery disease that they are not aware of because they have no symptoms.

Healthy heart living is not just for older adults. Autopsies of young men killed in the Vietnam War showed that many had coronary artery disease

and lifestyles have not improved in the past 30 years. Many of our youth today are overweight and don’t exercise. We are raising our next generation of heart attacks. It is important to teach young children healthy heart living as they are growing up.

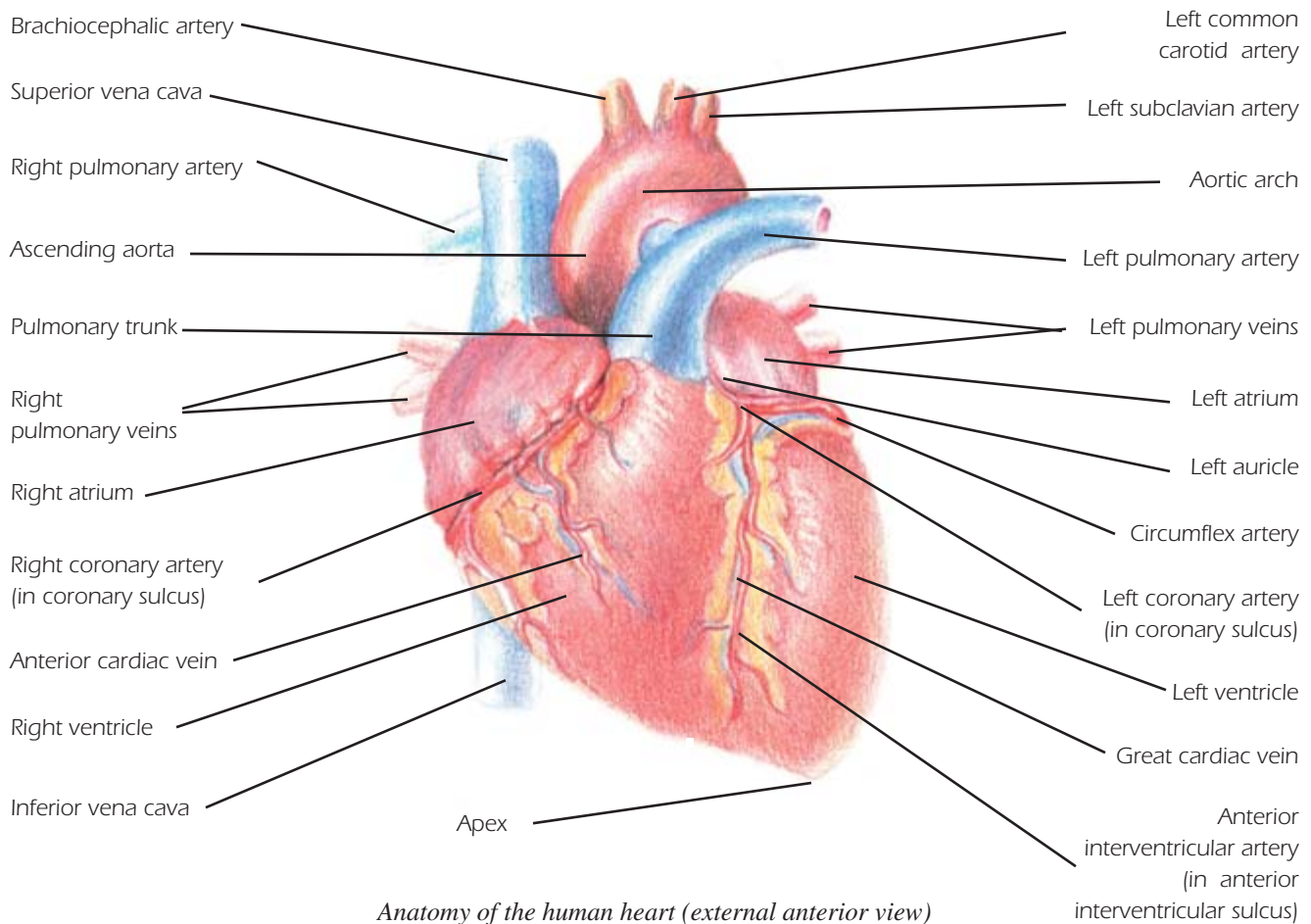
The good news is that many advances in the understanding and prevention of heart disease have occurred in recent years. With better knowledge, testing, and medications, people are living longer, healthier lives.

All of the information in this article is current and is taken from established medical recommendations and medical literature. It is intended for general knowledge on the subject, not as a substitute for proper medical evaluation and care. If you have any of the risk factors listed or any heart symptoms, you should see a physician and follow a plan for healthy heart living.

The heart

Ancient Greeks thought that the heart was the source of intelligence. Others throughout time believed it to be the seat of emotions. Most of us, however, don’t even think of our heart unless it beats hard or skips a beat.

The heart is actually a muscular pump located in the chest behind the sternum (breastbone) with its lowest point pointing to the left. About the size of a fist, it weighs less than a pound. The right side of the heart pumps the blood returning from the body to the lungs, replacing carbon dioxide waste products with oxygen. The left side of the heart is more



muscular and pumps the oxygenated blood from the lungs to all the tissues of the body.

The heart itself does not receive blood for its own use from the blood that flows through its chambers. Rather, it receives blood from the coronary arteries, blood vessels that arise from the aorta immediately as it exits the heart. The left coronary artery begins from the left side of the aorta and branches into two main branches, the anterior interventricular artery and the circumflex artery, providing blood to the middle and left sides of the heart. The right coronary artery branches off the right side of the aorta and splits into the marginal artery and posterior interventricular artery supplying blood to the right side of the heart.

The blood supplied by the coronary arteries nourishes and provides oxygen to the muscle tissues of the heart. An interruption of coronary artery blood flow, as seen in coronary artery disease, can cause injury or death of the heart muscle supplied by the affected blood vessel.

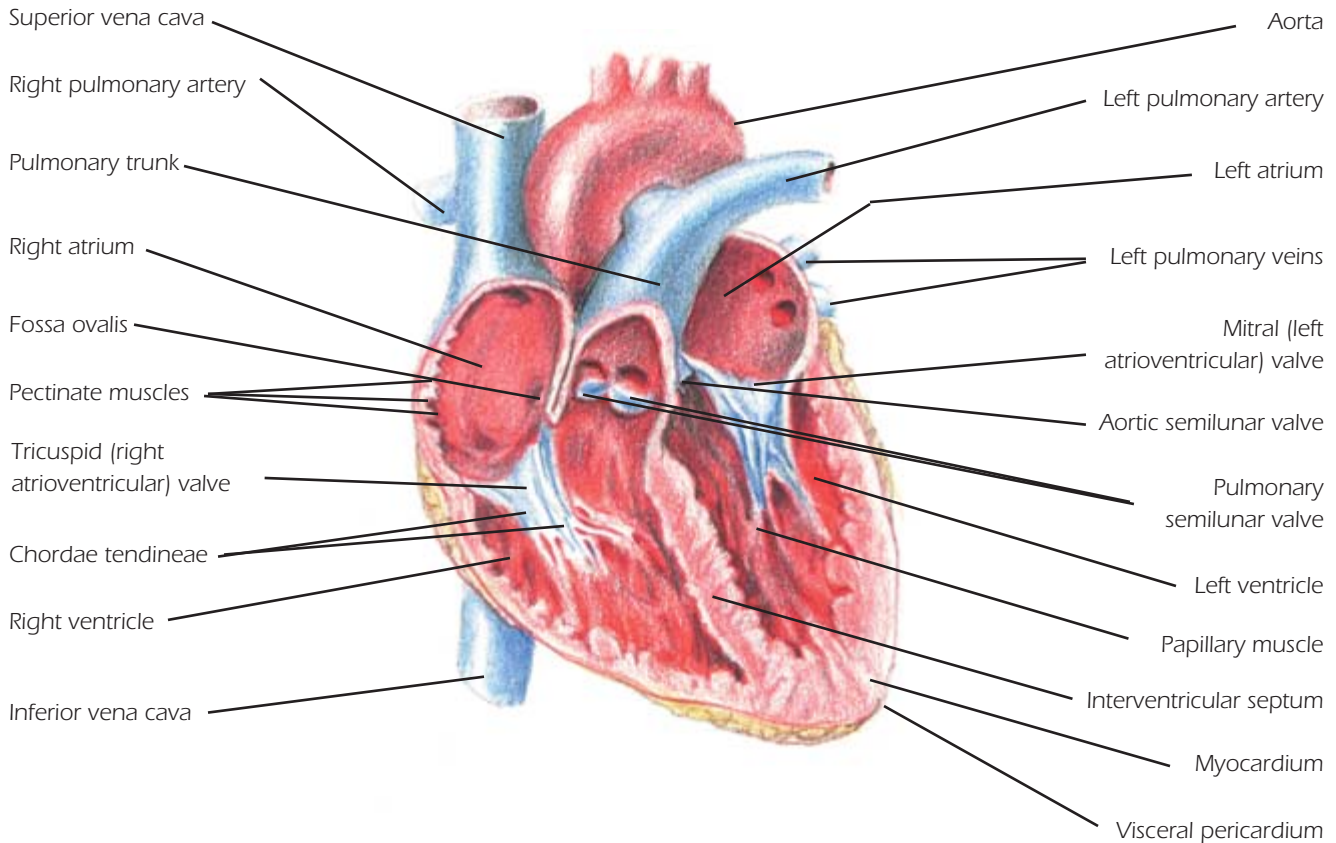
What is heart disease?

Heart disease can include problems to the coronary arteries, heart muscle, heart valves, or the conduction system. This article will deal only with coronary artery disease, the disease that leads to heart attacks.

Commonly called “hardening of the arteries,” atherosclerosis and arteriosclerosis are medical terms used to describe a buildup of fatty deposits in the inner lining of the blood vessels of the body. When the arteries of the

heart are affected it is called coronary artery disease. Blood vessels are partially blocked, blood flow to the heart is diminished, and the heart muscle does not receive the amount of oxygen it needs. A common symptom of this is angina pectoris, or chest pain, due to low oxygen causing temporary injury to the heart muscle cells. This often occurs during exercise, when oxygen requirements of the heart are increased.

If blockage of the coronary arteries is prolonged or more complete, a heart attack (myocardial infarction) can occur as the lack of oxygen causes heart muscle cells to die. If the myocardial infarction is severe, an individual can die due to extensive loss of heart muscle tissue (a weakened heart) or electrical conduction disruption (arrhythmia).



Anatomy of the human heart (frontal section)

Most people with symptoms of angina or heart attack have chest pain that stimulates them to seek medical care. Through diet and lifestyle changes, medications, or surgical intervention they can restore the blood flow to the heart and live a normal life. Surgical intervention can include an angioplasty, where a balloon is inserted inside the artery and it is stretched open, or bypass surgery, where other arteries or veins are grafted from the aorta to the heart to “bypass” the obstructed section of the coronary artery.

Unfortunately, the first warning some people have is death. They have silent ischemia, a condition where blood flow through the coronary arteries is diminished, but without causing pain to warn them. They can suffer a fatal heart attack and die suddenly without warning.

The good news is that coronary artery disease is largely preventable.

What causes coronary artery disease?

Long-term studies have clearly identified certain risk factors for coronary artery disease, heart attack, or stroke. Some factors, such as heredity, sex, race, and age, cannot be changed. Others, such as diet, cholesterol level, cigarette smoking, high blood pressure, diabetes, exercise, and stress, can be altered through lifestyle changes or medications.

Risk factors that cannot be changed can be used to determine the likelihood of developing heart disease. A family history of heart disease is a strong clue that children may develop disease. Family history would include a heart attack or sudden death of a father or male sibling occurring under

the age of 55 or mother or female sibling occurring under the age of 65. Men over the age of 45 and women over the age of 55 with normal menopause or over the age of 45 with early menopause and no estrogen replacement are at higher risk.

Millions of Americans begin unhealthy living habits at a young age. Children overeat, eat unhealthy foods high in cholesterol and fat, and do not exercise enough. Rather, they tend to be “couch potatoes” in front of the television, computer, or electronic games. This carries over into adolescence, where many add the habit of smoking. By the time they reach adulthood, many Americans are already obese, lead sedentary lifestyles, and smoke heavily.

A recent study in the *Journal of the American Medical Association* found that over 60% of American adults

were considered overweight and 5% extremely obese. We don't need studies to show that is true. Just look around when you are with a group of people.

Most individuals reach their adult weight by age 21 to 25. After this age, fewer calories are needed to maintain the same weight. Unfortunately, most people in their 30's and 40's eat at least as much as they did in their 20's, if not more, and are usually less physically active. The calories eaten in excess of those burned by metabolism and exercise are stored as fat.

Individuals who are significantly overweight (over 30% greater than normal weight) have a shorter life span than those who are normal weight. For example, middle aged men who are overweight have a three times greater chance of having a fatal heart attack as men the same age who are not overweight. Studies are indicating that individuals who reduce their calorie intake by 20 to 40% may prevent or delay heart disease, even when they start doing so at middle age.

Diet is important not only in managing weight, but also the amount of fat and cholesterol in the blood. Cholesterol is both manufactured by the body and taken in through diet. Excess cholesterol is deposited in the inner lining of arteries, causing atherosclerosis. It is thought that cholesterol needs a chemical reaction called oxidation to form pockets of disease known as plaques. Vitamin C and vitamin E are anti-oxidants and are sometimes recommended as it is thought they may help reduce plaque formation.

Individuals with increased risk of LDL cholesterol, to be discussed later, of over 130 mg/dL or HDL cholesterol of less than 40 mg/dL are at greater risk. The risk of having a heart attack doubles when the total cholesterol rises from 200 to 250.

Cholesterol management is somewhat dependant on the natural production of cholesterol by the body. Occasionally, individuals can eat virtually cholesterol-free diets (such as strict vegetarians) and have very high natural cholesterol levels. Many other people can have dramatic lowering of their cholesterol with only moderate dietary changes.

High blood pressure (hypertension) is associated with an increased risk of heart attack. The increased pressure on artery walls seems to set up an inflammatory reaction that causes heart disease. Blood pressure exceeding 140/90 mmHg can damage the heart, kidneys, and other organs and increases the risk of heart attack, stroke, or kidney failure.

Smoking currently or within the past 5 years raises the chance of many diseases including heart disease. The younger an individual is when they begin smoking, the greater the future risk. Individuals who quit smoking have a lower death rate from heart attack than current smokers.

Diabetics almost all have high cholesterol and have up to four times more than the normal risk of heart attack. Aggressive treatment of diabetes with diet, weight management, and medication is important to minimize heart disease and other debilitating complications.

A sedentary lifestyle may lead to a higher risk of heart disease. Exercise tones muscles and the heart, stimulates circulation, and helps maintain normal weight. Strenuous exercise or work in someone unaccustomed to such activity may cause a heart attack in an apparently healthy individual with undiagnosed heart disease, so a physician should be consulted before starting an exercise program.

Other known factors that lead to heart disease include a Type A personality, especially in hostility prone individuals, depression, and lack of a supportive primary relationship. It is also known that job stress in individ-

uals who have other cardiac risk factors can trigger heart attacks. Individuals who felt they had high demands at work with little opportunity for advancement and a feeling that their job was not rewarding were twice as likely to have a heart attack, according to a study in the British Medical Journal.

Our understanding of heart disease is changing rapidly. Medical researchers are constantly identifying other risk factors that cause heart disease.

Inflammation is emerging as a major factor in the development of coronary artery disease. It appears that in some individuals the immune system attacks the coronary arteries in response to inflammation or infection. A recent study of 28,000 women at Boston's Brigham and Women's Hospital has conclusively shown that



A healthy lifestyle is important beginning at a young age. Eat right, exercise, and minimize your risk factors for heart disease. Finding some physical activity that you enjoy makes it easier to exercise on a regular basis. In the winter, my daughter, Sonja, cross-country skis for relaxation and exer-



It is easy to forget how many calories you are eating. This typical fast food meal consisting of a Big X-tra hamburger with cheese, super-sized fries, chocolate shake, and apple Danish has 2120 calories. For many people, this one meal alone exceeds the calories recommended for an entire day.

inflammation by itself can cause heart attacks in women with normal cholesterol levels.

Doctors believe that a chemical necessary for fighting infection, C-reactive protein (CRP), is produced by the body and does damage to the blood vessels of the heart by weakening plaques in the linings of the arteries. When plaques weaken enough, they burst releasing a chemical that causes the blood to clot and block blood flow through the artery, causing a heart attack.

In the Boston study, women with high levels of CRP had a greater chance of heart attack even when they had low cholesterol levels. High CRP levels combined with high cholesterol levels made the risk even greater.

Inflammation that raises CRP levels can be caused by anything from a lingering infection, smoking, high blood pressure, or obesity. Bacterial or viral infections that can linger in your body for years are also being looked at as a source of inflammation. A respiratory infection due to Chlamydia pneumoniae is known to be associated with an increased risk of heart attack. It can be tested for in the blood and treated with antibiotics. Even low-grade gingival (gum) infec-

tions are suspected as a source.

Both aspirin and “statin” drugs used to treat high cholesterol, such as pravastatin (Pravachol), lovostatin (Mevacor), or atorvastatin (Lipitor), have been shown to lower C-reactive protein levels.

C-reactive protein in the blood can be tested with a simple blood test. It is probably a good idea for everyone who has their cholesterol checked to also have their CRP checked. Doctors are still debating which individuals should be checked

and what to do if CRP levels are high. The American Heart Association is currently discussing recommendation guidelines for testing. As this may completely change the way we think about and manage heart disease, until they decide, it is probably a good idea to pay attention to inflammation as a risk factor.

An amino acid called homocysteine can be found in elevated levels in some individuals. Doctors feel this can irritate the inner lining of blood vessels and be a source of inflammation that can trigger a heart attack. Recent studies have shown that lowering the homocysteine levels by 25% will lower an individual’s risk of heart disease by 10%. Adequate levels of folic acid and vitamins B-6 and B-12 in the diet or in dietary supplements will reverse high homocysteine levels.

Metabolic syndrome affects one in four Americans and is considered a risk for heart disease. It is a syndrome that includes three or more of the following conditions: heavy around the waist, low HDL, high triglyceride levels, borderline or high blood pressure, or elevated blood sugar. Each of these can be treated.

A cholesterol product called lipoprotein (a) is another risk factor that is thought to contribute to formation of blood clots in coronary arteries. Up to 30% of individuals with early heart disease have high levels of lipoprotein (a). Levels are largely hereditary and can be tested with a simple blood test. Estrogen or high doses of niacin can lower these levels.

As you can see, there are many factors involved in heart disease and there is no question that understanding it all is complex. In fact, the health of the coronary arteries has been shown to be so important that a new specialty in medicine is in the process of developing. Endotheliologists (named after the inner lining of blood vessels) will be physicians that manage all the conditions that affect artery health.

Fortunately, it is not necessary for us to understand why everything works in order to make the lifestyle changes that can reduce the risk of heart disease.

Assessing your risk

My physician saved my life. While having a routine annual physical, I mentioned a vague shoulder pain I had while swimming. He suggested I have an exercise treadmill to make sure it was not coming from the heart. “I think it is bursitis,” I said. “I exercise regularly and don’t have chest pain.”

He convinced me to do it and after a few additional tests, I was on the operating table. I was lucky he was suspicious and didn’t just assume it was bursitis. I could have been one of the many who die suddenly.

The first thing to do to assess your risk of heart disease is to see a physician to evaluate your risk factors and develop a plan for healthy heart living. Laboratory studies (blood work) should be obtained. Depending on your situation, other heart studies might be recommended. Your physi-



Aerobic exercise decreases the risk of heart disease by lowering cholesterol, triglycerides, and blood pressure. Swimming, dancing, walking, jogging, bicycling, or similar activities are good activities. Treadmills have been found to be the most effective indoor exercise equipment.

cian can also help you safely start an exercise program.

For those individuals who have been determined to have no risks of heart disease, following a healthy heart lifestyle is all that is needed. Individuals with cholesterol, blood pressure, or diabetes problems can be helped with medications in addition to a healthy heart lifestyle.

Laboratory studies

Cholesterol is a type of fat, called a lipid, which the body uses to build cells and certain hormones. It is produced by the body and is also absorbed through our diet. When the level of cholesterol in our blood is more than is needed, it may build up along artery walls.

Cholesterol molecules in the blood attach to a protein as they travel

throughout the body. This molecule is called a lipoprotein. Lipoproteins are classified as to how much fat is attached to the protein. Ones with more protein than fat are called high-density lipoproteins, or HDL, while lipoproteins with more fat than protein are called low-density lipoproteins, or LDL. Triglycerides are another type of lipid (fat) measured in the blood.

The risk of heart disease is commonly assessed by simple blood tests that evaluate the amount of lipids in the bloodstream. The National Cholesterol Education Program recommends a routine fasting lipid analysis (lipid panel) for adults every 5 years, starting at age 20. A typical lipid panel will evaluate the total cholesterol, LDL, HDL, and triglycerides.

Total cholesterol

Total cholesterol is typically used as a screening to determine the total amount of lipids in the body. Levels below 200 mg/dL are recommended. A middle-aged man who has a level of 250 mg/dL has twice the risk of having a heart attack as compared to what it would be if it was 200 mg/dL. Since coronary artery disease takes years to develop, a high total cholesterol level in a young individual definitely needs to be taken seriously.

Total cholesterol can be lowered by diet (reducing saturated fats while increasing fiber and complex carbohydrates), weight loss, and exercise.

Disposable home cholesterol tests can be obtained without a prescription. They test total cholesterol and can be as accurate for screening as tests used by physicians. Costing about \$10 to \$20 they are performed by an individual by sticking their finger to obtain blood and placing it on a thermometer-like test strip. Results are given not in numbers, but in according to risk of heart disease: normal, borderline-high, and high. They may be useful as a screening,

but, if elevated, one should see a physician for a complete lipid panel.

LDL cholesterol

LDL is commonly called the “bad cholesterol” because it is the cholesterol that accumulates on the inner lining of arteries. LDL cholesterol is calculated (vs. being measured) from the total cholesterol, HDL, and triglyceride measurements. When the triglyceride level is high, this can give an inaccurate LDL level.

Low levels of LDL help prevent heart diseases. LDL levels of less than 130 mg/dL are recommended in individual with no history of heart disease. Individuals with a history of heart disease should have levels of LDL below 100 mg/dL.

Besides a high-fat diet or heredity, high LDL levels can be caused by medications, including some diuret-



Strength and resistance exercises (muscle toning) using free weights, weight-training machines, or elastic tubing is an effective way to build lean muscle tissue. Increasing lean muscle mass helps reduce weight and reverses the natural progression of muscle loss that occurs with age.

ics, corticosteroids, androgens (male sex hormones), tranquilizers, and birth control pills. Diabetes, anabolic steroid use, and a number of diseases also raise LDL.

Lowering LDL cholesterol can be done with a low-fat diet, exercise, or medications.

HDL cholesterol

HDL is commonly called the “good cholesterol” because it removes LDL cholesterol from the blood by binding with it in the bloodstream and transporting it to the liver where it is disposed. A high level of HDL lowers an individual’s risk of coronary artery disease.

An HDL level should be as high as possible. A level of greater than 40 mg/dL is preferable. Lower than this and an individual is at risk of coronary artery disease. Low HDL levels are largely determined by genetics, however, they may also be caused by diabetes, smoking, excessive weight, lack of exercise, or high triglycerides.

HDL can be increased by vigorous physical exercise, losing weight, and stopping smoking. As much as a 5 pound loss of weight can increase HDL. Moderate alcohol use (1 ounce per day) may be beneficial and increase HDL, but may also have the negative effect of raising triglycerides and contributing to liver problems or alcoholism.

Ratio of LDL/HDL

An individual with a low HDL is at less risk if their LDL is also low because there is less circulating LDL to attach to the artery walls. Conversely, an individual with a high HDL can tolerate higher levels of LDL without developing coronary artery disease.

Triglycerides

A type of fat used by the body to store energy, triglycerides are found in only small amounts in

the blood. Still, they are a type of fat that can also build up in the walls of arteries. High levels of triglycerides, with or without high levels of LDL, are a risk factor for coronary artery disease.

Triglyceride levels are considered normal if they are below 150 mg/dL. Borderline high are 150 to 199, high 200 to 500, and very high is above 500.

High triglyceride levels can be caused by diet, weight gain, alcohol, diabetes, kidney disease, and heredity. Triglyceride levels can be lowered by a low-fat diet, losing weight, increased exercise, and medications. A 5-pound weight loss is enough to help lower triglycerides.

It has been clearly established that triglycerides can also be lowered with omega-3 fatty acid, therefore decreasing the risk of cardiac disease. A study of 11,000 individuals who had heart attacks found that sudden cardiac death was reduced 45% when patients took 850 mg of omega-3 fatty acids per day.

Omega-3 polyunsaturated fatty acid can be obtained through diet. Commonly referred to as “fish oil,” it is found in fish and some plants. Fish sources, including albacore tuna, salmon, Rainbow trout, Atlantic cod, and some other fish, are a source of EPA and DHA, two types of polyun-



Omega 3 fatty acids, found naturally in fish and some plants, can help lower elevated triglyceride levels. Dietary supplements, as shown here, are a way to include enough omega 3 fatty acids in the diet daily.

saturated fatty acids. Plant sources include almonds, walnuts, raw soybeans, and flaxseed and are a source of ALA, the third type of polyunsaturated fatty acid. Note that flaxseed also causes a huge increase in the risk of prostate cancer, so it is not a good idea for men to use this as a source of omega-3.

Another source of omega-3 fatty acid is a dietary supplement. It is recommended that four capsules each containing 300 mg of EPA and 200 mg of DHA be taken daily. Trader Darwin’s Omega-3, available at Trader Joe’s, and Omega Caps, available at health stores, are two brands that contain the correct amount. Take 2 capsules twice a day.

Other blood tests

After initial screening of the lipid level in the body, a physician may recommend additional blood tests. These may include checking levels of VLDL (very-low-density lipoprotein), homocystine, C-reactive protein, or lipoprotein a. As mentioned previously, it may become common to have C-reactive protein tested with the initial lipid testing.

Heart studies



Medications prescribed by a physician can lower cholesterol levels when diet and exercise alone are not enough.

Depending on symptoms, history, and cardiac risk factors, other tests may be recommended by your physician to screen for coronary artery disease. These may include an EKG, exercise EKG (treadmill), heart scan, or angiogram.

What you can do

Healthy heart living is following a healthy lifestyle that will reduce your risk of heart disease while also helping to prevent a stroke, other vascular disease, diabetes, and a number of other disabling diseases. Many of these recommendations also reduce the risk of cancer.

Healthy heart living can be accomplished through your lifestyle, diet, dietary supplements, and, as needed, medications from your doctor.

Is it easy to change your lifestyle? It hasn't been for me. We are so accustomed to eating a certain way, living a certain way, and to our daily routine. Our social life also partially determines our activity and what we eat. I have lived a healthy heart lifestyle for the 12 years since my surgery and I still struggle with it at times. It doesn't mean we shouldn't try, however.

Diet

A diet low in fat is recommended. Current guidelines recommend the total calories from fat in a diet be 25 to 35%, from carbohydrates 50 to 60%, and from protein 15%. Saturated fats, such as found in cheese, whole milk, and red meat, should be less than 7% of the total calories.

Practically speaking, this means to go light on meat and eggs, use low-fat dairy products, watch the amount of fat and oils, eat fruits and vegetables, and use low-fat breads, cereals, and grains.

Meats should be limited to 5 to 6 ounces per day of lean meat, poultry without skin, or fish (not fried). Cold-water fish have fish oil, unsaturated

omega-3 fatty acids, which have been shown to decrease triglycerides.

Egg yolks should be limited to less than 2 to 4 per week, substituting 2 egg whites for one whole egg in recipes. Many egg substitute products are available at the market and in many restaurants.

Two to three servings of low-fat dairy products per day are recommended. These could include skim milk, low-fat yogurt, low-fat cheese, low-fat cottage cheese, or frozen yogurt. Use low-fat creamer and low or nonfat sour cream.

Unsaturated oils are healthier than saturated oils. Unsaturated oils include safflower oil, sunflower oil, olive oil, canola oil, and oils in seeds and nuts. Saturated oils include coconut oil, palm oil, and milk chocolate. Watch the amount of oils used on salads. Three tablespoons of olive oil on a salad or in food is the same amount of calories as eating three, four-ounce scoops of ice cream.

Six or more servings of breads or cereals per day are recommended. These should be low-fat breads, cereals, and grains, including whole grain bread, oats, wheat, or corn, low-fat crackers, rice, and pastas. Avoid high fat pastries, croissants, and granola.

Fresh vegetables should include 3 to 5 servings per day, especially including green vegetables. Avoid fried vegetables, cream sauce, or cheese sauce. Include 2 to 4 servings of fruit per day, avoiding fried fruits, cream sauce, or butter sauce.

Soups tend to be high in calories, fat, and sodium. When choosing soups, avoid ones containing whole milk, cream, fats, or skins.

Desserts and sweets taste so great because they are full of fat and saturated oils. It is easy to add a lot of calories and fat to your diet by eating milk chocolate, doughnuts, cream pies, commercial pies and cakes, and desserts containing coconut oil, palm oil, or palm kernel oil.

Instead, eat low-fat cookies, pies, or pudding containing egg whites or egg substitutes, skim milk, and unsaturated oil or margarine. Angel food cake, fig or fruit bars, and ginger snaps are good alternatives. Frozen yogurt, ice milk, sherbet, and sorbet are good replacements for ice cream. Candy made with sugar, syrup, or honey, such as candy corn, gum drops, and hard candy, is a better alternative than chocolates.

I found that changing my diet was actually one of the easiest changes to accomplish. It is mostly being aware of what you are eating and choosing healthy alternatives. It is not as hard as it seems.

Exercise

Exercise, on the other hand, is harder to incorporate into your lifestyle. It takes time and it takes effort. If it is not something you already do regularly, it means finding the time and energy to exercise in your already busy schedule. Its benefits, however, are not some vague "improvement of future health." Exercise makes you feel better, sleep better, and have more energy. It makes you more productive and happier.

Physical exercise is the greatest way to keep weight off and strengthen muscle, yet most adults in the United States perform little or none. Twenty-five percent are completely sedentary and over 60% are physically active less than 30 minutes per day. Among Americans over 65 years old, 75% are sedentary.

Exercise builds healthy muscle. Aerobic exercise, such as walking, running, and swimming, increases the heart rate and is necessary for heart health. Strength and resistance exercises build and preserve lean muscle tissue. An exercise program should provide both and it is not as hard as one might think. It simply requires an exercise plan that you enjoy and will follow.

Aerobic exercise decreases the risk of heart disease, decreases cholesterol

and triglycerides, lowers blood pressure, reduces risk of colon, breast, and prostate cancer, decreases osteoporosis, reduces obesity, and improves the immune system, among other things. Daily, it is recommended that an individual have 30 minutes or more of moderate physical activity, such as a brisk walk for 30 minutes or three ten-minute walks. Three or more times per week, more intensive exercise that brings the heart rate to 60-80% of maximum for 20 to 60 minutes is recommended. This could include swimming, dancing, walking, jogging, bicycling, or similar activities.

For years I tried various indoor exercise programs using treadmills, stationary bikes, and more. I struggled every day with exercise because I hated it and would make any excuse not to make time to exercise. I'm too tired, too busy, I have to go here, I have to go there, my muscles still hurt from last time—I used them all. And I knew better. I had already been through heart surgery.

Then, I figured out I love to exercise outdoors. I don't care if it is hot, raining, or snowing, I would rather do something outdoors than stay inside. So, for me, bike riding, hiking, swimming, and snowshoeing are ways I enjoy getting aerobic exercise.

Many of my friends are the opposite. They like to watch television while exercising or enjoy the social interaction of sports clubs, so they use exercise machines indoors. Actually, treadmills have been found to be the most effective indoor exercise equipment, requiring more energy use than Stairmasters, rowing machines, Nordic track, or exercise bikes. Exercising indoors is also better when it is dark or bad weather outside.

Outdoors or indoors, it doesn't matter. What is important is that you find something that you enjoy doing and will work with your schedule. If it is

fun, you will do it without making excuses.

Speaking of schedules, if you don't include exercise in your schedule, it is never going to happen. You will never just "find time" in your day. Plan exercise into your daily schedule.

Some other practical exercise tips include walking instead of driving when possible, parking your car at a distance from a mall or office, using stairs instead of an elevator, playing golf without a cart, and exercising while watching television.

After age 20, an individual loses seven-tenths of a pound of muscle mass per year. Not only does strength

Here are the key things you can do to live a healthy heart lifestyle:

- Eat a proper diet
- Exercise
- Lose weight
- Manage lipids
- Blood pressure control
- Stop smoking
- Aggressively treat diabetes
- Dietary supplements

decrease, but lean muscle mass uses energy. The more muscle mass an individual loses, the fewer calories their body burns in a day. Their metabolism decreases and they gain weight while eating the same amount of calories.

If you are trying to lose weight, gaining muscle mass will increase your metabolism and burn more calories. For every pound of lean muscle mass a body increases, 50 calories more are used per day. Just one pound of increased muscle mass will burn 18,250 calories more per year, or 5.2 pounds of weight loss. Five pounds of increased muscle will cause 26 pounds of weight loss per year!

Aerobic exercise does not build lean muscle mass. Strength and

resistance exercises (muscle toning) performed twice a week are the most effective way to build muscle tissue. A muscle is challenged to perform above its current strength level by free weights, weight-training machines, elastic tubing, or an individual's body weight, stimulating production of lean muscle.

Forget the image of body builders or weight lifters. That is not what most of us need. A simple program using elastic tubing at home is as effective as "pumping iron" at a club. Strength and resistance training has even been shown to improve health and reduce injuries in elderly individuals living in retirement homes.

The key is to exercise regularly doing exercises that do not cause injury to joints or back. Start slow and avoid overdoing it with heavy weights. Increase weight or repetitions as time goes on. In his book, "Business Plan for the Body," author Jim Karas, shows with descriptions and photographs a low-impact strength and resistance program using elastic bands at home. Sports and exercise clubs also have trainers who can help develop a plan for an individual.

Lose weight

If you are one of the millions who are overweight, losing pounds can help your health tremendously. Despite hundreds of diets, exercise machines, and pills available, Americans are still grossly overweight. Most know that being overweight is not good for health, but it is hard to do anything about it.

Weight-loss is a major industry in our country, often based on the fact that we want quick fixes. The problem is that many of the products or diets don't work, or when they do, we regain the weight rapidly when we go off the product. It can take months of work to lose 20 pounds and a few weeks to put it back on.

I know this is true. Realizing I would be hiking at elevations as high as 10,000 to 12,000 feet, I trained for 6 months to go with my sons on a rugged 90-mile backpacking trip at Philmont Boy Scout Ranch in the mountains of New Mexico. I lost 30 pounds between the training and the trip. I felt great when my pants were too loose on the way home, but not so great when they were tight again a mere three weeks later.

The answer to weight-loss is actually pretty simple, but most of us don't want to hear it. If you eat fewer calories than you use, you will lose weight. Period.

This can be accomplished by eating less, by exercising more, or by doing both. If you eat right and exercise, you will lose weight. It is impossible not to lose pounds.

This does not mean it will be quick. After all, it took time to gain the extra pounds and it will take time to lose it. However, losing weight requires a permanent lifestyle change. It has to be more than just a temporary adjustment.

Individuals do differ and some lose weight easier than others. Genetics and metabolic conditions certainly are a factor. Twenty-five percent of an individual's weight is determined by genetics and the rest is determined by environment and behavior. For most of us, eating is 20% physical and 80% emotional. We eat without thinking when we are stressed, tired, or in social situations. Women typically lose weight slower than men since they frequently have less lean muscle tissue.

The first thing to do to lose weight is to determine what your body needs to survive, your basal metabolic rate. The basal metabolic rate is the amount of energy your body needs to function if you were to do nothing but stay in bed awake for 16 hours and asleep for 8. Add to this your activity per day and this is the amount of calories you need to maintain the same weight.

The formula for calculating your basal metabolic rate (BMR) is:

Instead of doing the calculations yourself, you can also go to the website www.fpnotebook.com (click on "Dietician in a Box") and let them do the calculations.

<p>For Women:</p> 661 $+ (4.38 \times \text{weight in pounds})$ $+ (4.38 \times \text{height in inches})$ $- (4.7 \times \text{age})$ $= \text{BMR}$ <p>For Men:</p> 67 $+ (6.24 \times \text{weight in pounds})$ $+ (12.7 \times \text{height in inches})$ $- (6.9 \times \text{age})$ $= \text{BMR}$

As an example, a 35 year old woman who is 5'5" tall and weighed 145 pounds would have a BMR of 1,416 calories per day. A man of the same age, height, and weight would have a BMR of 1556 calories per day. To this, add the calories expended by activity and exercise. Multiply the BMR by 1.15 for a sedentary lifestyle, 1.3 for normal, everyday activity, 1.4 if you exercise 3 to 4 times per week, 1.6 for exercise 4 to 5 times per week, and 1.8 for exercise 6 to 7 times per week.

If our 35 year-old woman's daily activity is limited to normal, everyday activities with no other exercise, she could eat 1,416 calories x 1.3, or 1840 calories, per day to maintain her current weight, while our 35 year-old man could eat 2023 calories. If they ate more, they would gain weight. If they ate less, exercised more, or both, they would lose weight. For every 3,500 calories that you exercise in excess of the calories you eat, you will lose one pound of weight in the

form of fat. So, if you burn 500 calories a day more than you eat, you will lose 1 pound in 7 days.

It is very easy to eat more than we should. Awareness of how many calories we are eating is the most important part of weight-loss. For example, a typical "healthy" dinner at an Italian restaurant might include 2 pieces of bread, a Caesar salad, a tomato, basil and olive oil pasta, 2 glasses of wine, and a few bites of dessert. This "healthy" dinner is approximately 2,300 calories, almost the total caloric intake for the entire day for our above man and woman.

If our woman exercised four times a week, her daily caloric needs increase to 2,265 calories, an increase of 60%. She can eat 849 calories more a day in addition to her BMR and not gain weight or eat the same and lose weight at a rate of about 1 pound every 4 days. Our man also increases 60% to 2489 calories, an increase of 934 calories over BMR. He could lose a pound every 3.5 days. It is certainly easier to exercise four days a week than it is to cut 800 to 1000 calories from out diet.

To lose weight, it is important to really pay attention to the portion size and calories. This can be done through self-determination or with support groups such as Weight Watchers. Recording the calories you eat daily in a notebook is a useful way to help watch calories. It is surprising how fast they add up.

A impressive website called Family Practice Notebook, a site intended for physicians, but available to anyone, has a unique, free analysis that can also help get you started. When you enter your age, weight, height, food likes and dislikes, and types of exercises you would do, it will calculate your metabolic rates, caloric needs, and give you a detailed print-out of recommendations for diet, ideal calories per day to eat, exercise, and weight-loss using the foods you like (or are at least willing to eat) and the exercise you like to do. It can be

accessed by going to www.fpnotebook.com and clicking on "Dietician in a Box."

Lipid management

Diet, exercise, and weight loss may take care of high cholesterol for many individuals. Minor changes in diet and weight make major changes in cholesterol levels for many people. For others, diet changes alone won't work. If it does not, then there are numerous cholesterol-lowering medications available through your physician.

The morning I entered the hospital for my surgery, I ate a high-fat diet of Eggs Benedict and ham, knowing I would never eat these foods again. A few hours after eating this meal, I had a non-fasting cholesterol test that showed me to have a cholesterol level of 200. After one year of being a complete vegetarian, eating no dairy, no eggs, and a very low-fat diet, my total cholesterol was 200. No change despite all that effort. Despite all my diet changes, I have a body that produces its own high cholesterol and medications are the answer.

High blood pressure

High blood pressure is a silent killer. You cannot feel when your blood pressure is high, so have your blood pressure checked by your physician. If you are prone to high blood pressure, buy an automatic blood pressure cuff, widely available at department stores and drug stores, and keep a record of your blood pressure.

While there are many causes of high blood pressure, some known and some unknown, it is usually controllable. Treatment includes weight loss if overweight, elimination of smoking, modifying stressful living habits, and increasing exercise. When these are not enough, medications to lower blood pressure can be prescribed by a physician. This will eliminate the harmful effects caused by high blood pressure.

Smoking and diabetes

If you smoke, stopping is important. Just as with weight loss, it is not easy for some people. Talk to your physician. They will be able to help with medications and information on local stop smoking groups that may help.

Diabetics need to aggressively control their diet and medications in order to prevent complications to all of the blood vessels of the body, including the coronary arteries.

Dietary supplements

Several dietary supplements and vitamins available at most markets and pharmacies are recommended by physicians for patients at risk of coronary artery disease. A multivitamin with vitamin B-6 and B-12 and a tablet of folic acid 400 micrograms per day helps decrease homocysteine levels which irritate linings of arteries. Vitamin C, 500 mg per day, and vitamin E, 400 IU per day, act as antioxidants. Two capsules twice a day of omega-3 fatty acid containing 300 mg of EPA and 200 mg of DHA may help reduce triglycerides.

Do it now

Is it easy to make these lifestyle changes? For most of us the answer is no. I have lived them for the 12 years since my heart surgery, so I understand.

However, they are necessary for all of us whether or not we have been diagnosed with heart disease. Healthy heart living can make you feel better and give a better quality of life.

Although it can seem overwhelming at first, all you have to do is to set your mind to it and make the changes. If it seems like too much, work at it a little bit at a time. See your physician, start doing some exercise, improve your diet, lose some weight, or stop smoking. Then, gradually improve other areas. Many hospitals offer education in healthy heart living, often associated with

their cardiac rehabilitation or community education programs.

Can you make all of the changes at once? Absolutely. Many people "see the light" when they have heart problems and are forced to make all the changes at once. They are scared into making changes. If they can, so can you.

The key is to start today to do something towards a healthy heart lifestyle. Not only will you feel better, I can guarantee that you don't want to hear, "I am sorry, you need immediate heart surgery." Δ