Preventing Heart Problems When You are at Risk

THE OHIO STATE UNIVERSITY
WEXNER MEDICAL CENTER

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Talk to your doctor or health care team if you have any questions about your care.

For more health information, go to **wexnermedical.osu.edu/patiented** or contact the Library for Health Information at 614-293-3707 or health-info@osu.edu.

Why You are at Risk

Your healthcare provider has determined that you are at risk of heart or cardiovascular problems. You may have already had a heart-related problem and are at risk for having another, possibly more serious.

Now is the time to make changes that can lower your risk of that happening. Some risks you can control and others you can't. These are called risk factors.

Your risk factors

The risk factors for heart disease that you cannot control are things like your age, gender and family history. The risk factors you can control are listed below. Your chance of having heart disease goes up the more risk factors you have from the list.

Your risk factor are:

- ❑ High blood pressure
- ❑ Diabetes.
  Your hemoglobin A1C (HbA1C) value is _____
- ❑ High bad cholesterol.
  Your low density cholesterol (LDL, called bad cholesterol) is _____
- ❑ Cigarette smoking or other tobacco use
- ❑ Alcohol use
- ❑ Being overweight
- ❑ Not being active
- ❑ Having an unhealthy reaction to stress
- ❑ Other: _____

This book goes through these risk factors, possible heart problems and what you can do to lower your risk of these. Use this as a resource when you go home.

Work with your healthcare team to make a plan, knowing what your personal risk factors are.

About the Heart

Your heart is a muscle. It is slightly larger than your fist and weighs less than a pound. It is located to the left of the middle of your chest. Your heart pumps blood to the lungs and to all parts of your body. The blood provides your body with oxygen and nutrients. It also carries away waste. To do this well:

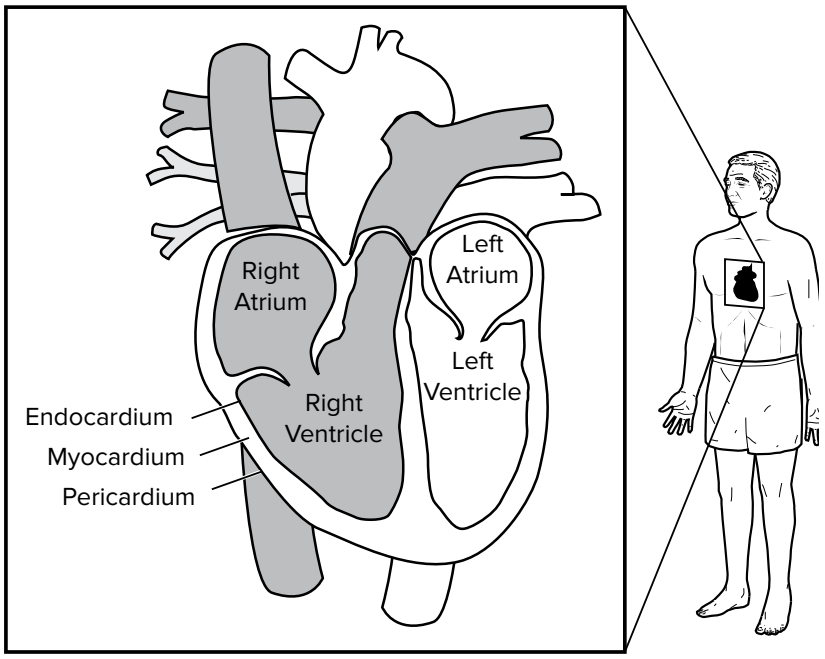
- The heart muscle itself needs a good blood supply.
- The heart must be able to fill with blood and have a strong pumping action.
- The heart valves must be working right.
- The heart beat should be regular.

Structures of the heart

Layers

Your heart muscle has three layers:

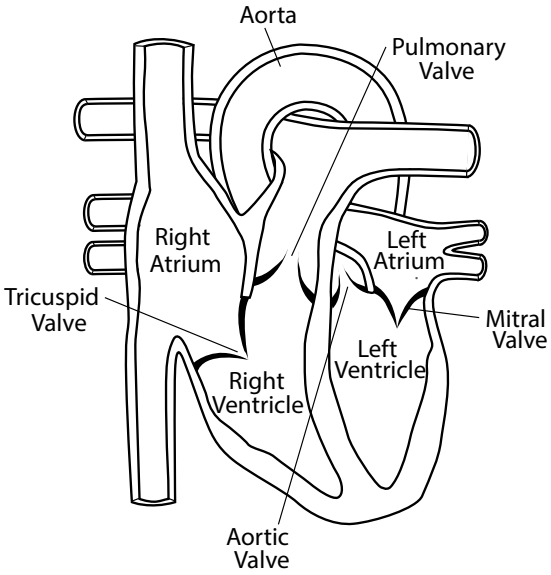
- Myocardium: This thickest layer is also the middle layer
- Pericardium: This outside layer surrounds the myocardium
- Endocardium: This thin layer lines the inside of the myocardium



Chambers

The normal heart has four chambers. A wall divides the heart into a right and left side. Each side is divided into two chambers.

The upper chamber is called the **atrium** and the lower chamber is called the **ventricle**. These chambers are separated by valves that open and close.



Valves

The valves allow blood to flow only in one direction. Valves direct the flow of blood through the heart, to the lungs and to the rest of the body. There are four valves:

- Tricuspid: Located between the right atrium and ventricle
- Pulmonic: Located between the right ventricle and lungs
- Mitral: Located between the left atrium and ventricle
- Aortic: Located between the left ventricle and the rest of the body

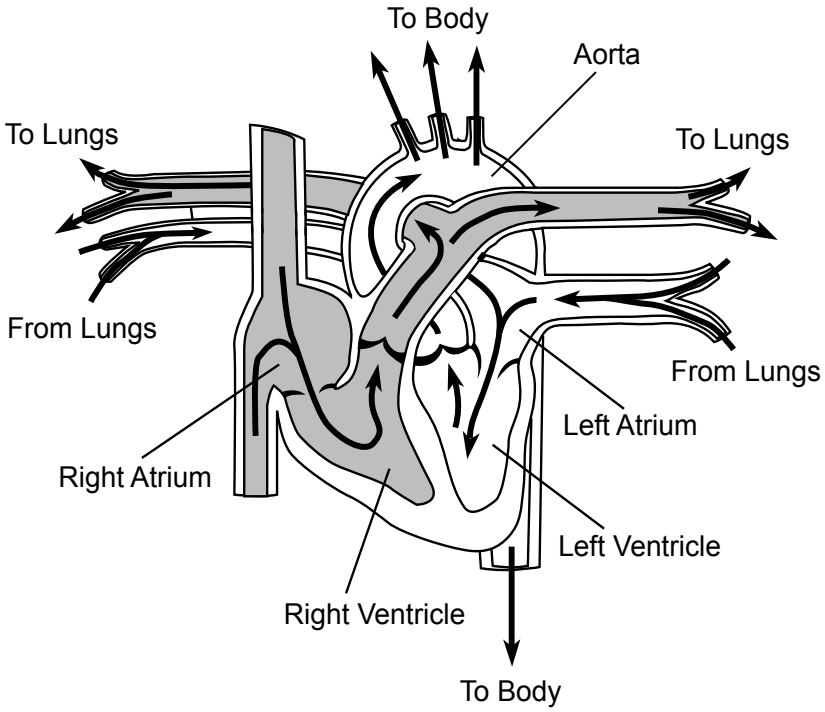
Blood vessels

Blood vessels carry blood to and away from the heart. Vessels that carry blood from the heart to the body are called **arteries**. Vessels that carry blood from the body back to the heart are called **veins**.

Blood flow through the heart

Your heart acts as a double pump:

- The right side pumps blood to your lungs, where the blood picks up oxygen and then returns it to the left side of the heart.
- The left ventricle then pumps blood out to your body through the large artery, called the aorta.
- Oxygen is removed from your blood by the cells, so it can be used by your body.
- The blood then returns to the right side of the heart through your veins. The right side of the heart once again pumps your blood to the lungs where oxygen is picked up.
- This process occurs with each heartbeat.



Each heartbeat has two phases:

- The resting phase is called **diastole**. During diastole, blood from the atria fills the ventricles.
- Then the ventricles pump blood to your body or lungs. This pumping phase is called **systole**.

Systole and diastole are shown in your blood pressure numbers. Systole is the top number and diastole, the bottom, as in 120/80.

The work of the heart changes with your body's needs. For example, when you exercise, your body needs more blood and oxygen. Your heart pumps harder and faster to deliver more blood to the body. When you sleep, less blood and oxygen is needed and your heart slows down.

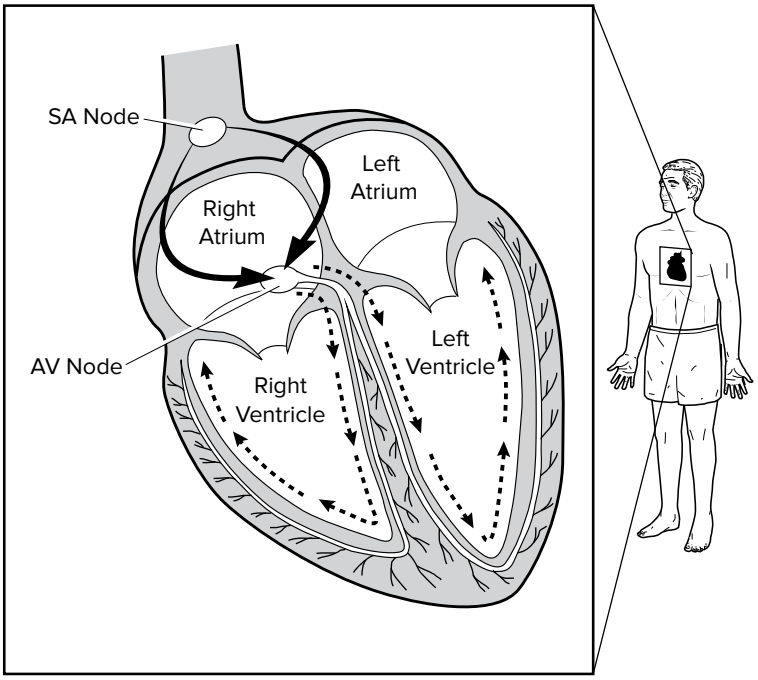
The heart's conduction system

Your heart has a normal conduction or electrical system that stimulates the heart muscle to beat.

Electrical impulses travel in a normal fashion from the upper chambers to the lower chambers over this conduction system.

This diagram shows how the impulse travels over the conduction system.

1. Normal heartbeats begin at the **SA node** that acts as the heart's "pacemaker." The SA node is also called the **sinus node**.
2. The electrical impulse spreads across the right and left atria.
3. The impulse travels through the **AV node** to the **Bundle of HIS**.
4. The Bundle of HIS divides into a **left and a right bundle branch**. The impulse spreads through these bundle branches into the **Purkinje** (pŭr-kin'jē) **fibers** in the ventricles.



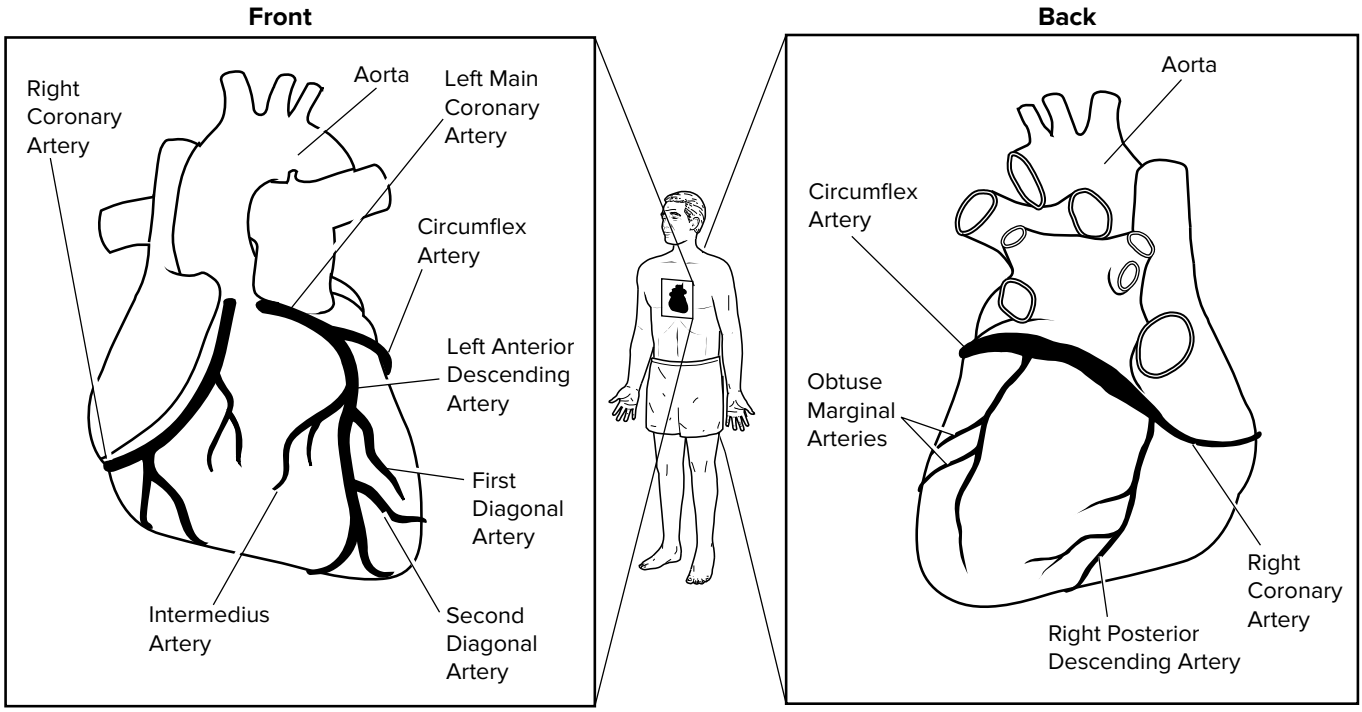
Blood supply of the heart (coronary arteries)

The heart muscle itself must receive a constant supply of oxygen. Oxygen is carried in the blood through the coronary arteries.

Two main coronary arteries, a right and a left, supply the heart muscle with blood. These arteries are located on the surface of the heart. They divide into many smaller branches that go into the heart muscle.

All parts of the heart muscle are supplied with oxygen-rich blood through these small arteries.

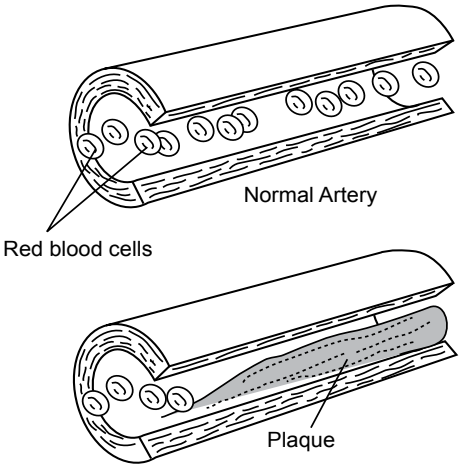
Here is how these arteries wrap around from the front to the back of the heart:



Common Cardiovascular Problems

Cardio means heart and vascular refers to your blood vessels. Cardiovascular disease is the broad term for problems with the heart and blood vessels. These problems are often due to atherosclerosis. This condition occurs when fat and cholesterol build up in blood vessel (artery) walls. This buildup is called plaque. Over time, plaque can narrow blood vessels and cause problems throughout the body.

Types of problems



Coronary heart disease (CHD) is the most common type of heart disease, is when plaque builds up in the arteries leading to the heart. CHD is also called coronary artery disease (CAD).

- Heart cannot get enough blood and oxygen when arteries are narrow.
- A blocked artery can cause a heart attack.
- Heart muscle can weaken, causing heart failure or arrhythmias (heart rhythm problem).

Heart failure occurs when the heart muscle becomes stiff or weak.

- Heart cannot pump out enough oxygen-rich blood, causing symptoms throughout the body.
- May affect only the right side or only the left side of the heart. More often, involves both sides.
- High blood pressure and CAD are common causes of heart failure.

Arrhythmias are problems with heart rate (pulse) or heart rhythm.

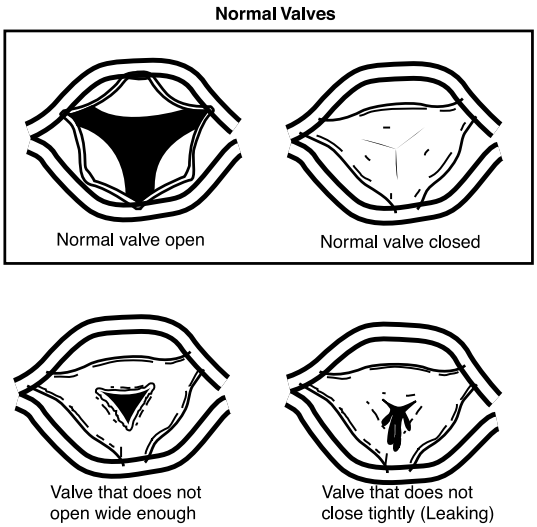
- Heart's electrical system doesn't work properly. Heart may beat too fast, too slow, or unevenly.
- Certain heart problems, such as heart attack or heart failure can cause problems with the heart's electrical system.
- Some people are born with an arrhythmia.

Peripheral artery disease occurs when the arteries to your legs and feet become narrow due to a buildup of plaque.

- Narrow arteries reduce or block blood flow.
- When blood and oxygen can't get to the legs, it can injure nerves and tissue.

Heart valve diseases occur when one of the four valves in the heart does not work properly.

- Blood can leak through the valve in the wrong direction (called regurgitation), or a valve may not open far enough and block blood flow (called stenosis).
- An unusual heartbeat, called a heart murmur, is the most common symptom.
- Certain heart problems, such as heart attack, heart disease, or infection, can cause heart valve diseases.
- Some people are born with heart valve problems.



High blood pressure (hypertension)is a cardiovascular disease that can lead to other problems, such as heart attack, heart failure, and stroke.

Stroke is caused by a lack of blood flow to the brain.

- This can happen because of a blood clot traveling to the blood vessels in the brain, or bleeding in the brain.
- Stroke has many of the same risk factors as heart disease.

Congenital heart disease is a problem with the heart's structure and function that is there at birth.

- Congenital heart disease can describe a number of different problems affecting the heart.
- It is the most common type of birth defect

Source: U.S. National Library of Medicine, Understanding cardiovascular disease

Angina and myocardial infarction (heart attack)

When blood flow is decreased in the arteries to the heart it can cause angina, shortness of breath, or even a heart attack to occur.

Angina

Angina is a pain or discomfort in the chest, arms, or jaw. It often occurs during exercise, stress, or other activities when your heart rate and blood pressure increase. With these activities, the heart muscle needs more blood with oxygen. The pain is a signal that not enough blood is getting through the arteries. Angina is often brief, lasting a few minutes and is relieved by rest and/or nitroglycerin.

Angina is not a heart attack. During angina, the **flow of blood** to the heart muscle is only **reduced temporarily.**

Myocardial infarction (MI or heart attack)

A heart attack results from a lack of blood to a part of the heart muscle. This occurs when a blood clot forms in the narrowed artery, and the artery becomes blocked. A blood clot forms when there is a crack in the plaque. A heart attack causes part of the heart muscle to be permanently damaged.

Is it angina or heart attack?

Knowing the difference between angina and heart attack pain is important, so you do not delay getting help. Below are the typical ways to know the difference.

	Angina	Heart Attack
Cause	Temporary lack of blood supply to the heart muscle.	Lack of blood supply to the heart muscle is longer, resulting in permanent damage.
Location	Pain behind breastbone, which spreads across chest. May go to shoulder, arms, neck or stomach.	Pain is located in the same areas as angina.
Type of Pain	Pressure, crushing, aching, choking, squeezing, burning or feeling of heartburn.	Same type of pain as angina, but more intense.
How long does it last?	Brief, gone within 15 minutes.	Lasts longer than 15 minutes.
What triggers the pain?	Angina is related to things that require your heart to do more work, such as exposure to extreme temperatures, exercise, etc.	Not related to things that require the heart to do more work. May occur at rest.
Relief of Pain	Rest and nitroglycerin.	Only temporary relief with rest and nitroglycerin.
Other Signs	Mild sweating and shortness of breath.	Severe sweating, shortness of breath, profound weakness, nausea, anxiety, vomiting and dizziness.
Actions to Take	1. Stop. Rest. 2. Put 1 nitroglycerin under your tongue every 5 minutes for a total of 3 tablets over 15 minutes. **At any time if your chest discomfort or pain does not improve or is getting worse even with nitroglycerin, call 911. Do not drive yourself to the hospital.** 3. If pain is relieved, call your doctor. 4. If pain is not relieved after 3 tablets, **call 911 right away**.	1. Sit or lie down, propped up if breathing is difficult. **2. Call 911**. Do not drive to the hospital or delay by calling your doctor. 3. You may take 1 nitroglycerin under your tongue every 5 minutes up to a total of 3 tablets over 15 minutes.

Know Your Own Signs

No two people have the same signs. People with diabetes may not have pain due to nerve damage, called neuropathy. Women may have “atypical” signs, such as back pain, unusual fatigue or shortness of breath. **Know your signs of angina or heart attack and take action!**

Controlling Your Risk Factors

Take control of your risk factors for heart disease. Work with your healthcare team to develop a plan. Depending on your own risk factors, your plan may include:

- Controlling high blood pressure
- Keeping your blood cholesterol in a healthy range
- Quitting tobacco use
- Managing your weight
- Being active
- Controlling your blood sugar if you have diabetes
- Eating a heart-healthy diet
- Limiting alcohol use
- Managing stress and relieving tension

Blood pressure

- Blood pressure is the force put on artery walls when your heart pumps and relaxes with each heart beat. It is measured with a blood pressure cuff.
- High blood pressure is also called **hypertension**. It is caused by the narrowing of arteries from plaque deposits. The harder it is for your blood to flow through your arteries, the higher your blood pressure.
- Having high blood pressure puts you at risk for heart disease, kidney disease and stroke. Most people have no symptoms. The only way to know is to have it checked.

Your blood pressure reading

The top number of your blood pressure reading is called **systolic**. It is the pressure measured in the arteries when the heart pumps out blood to the body. The bottom number is called **diastolic**. It is the pressure measured in the arteries when the heart relaxes and fills up with blood to prepare for the next pump of blood to the body.

- **Normal blood pressure:** systolic less than 120 and diastolic less than 80.
- **Elevated blood pressure:** systolic 120 to 129 and diastolic less than 80.
- **High blood pressure (hypertension) stage 1:** systolic 130 to 139 or diastolic 80 to 89.
- **High blood pressure (hypertension) stage 2:** systolic 140 or higher or diastolic 90 or higher.
- **Hypertensive crisis (consult your doctor right away):** systolic higher than 180 and/or diastolic higher than 120.

Lowering your blood pressure

- Check your blood pressure often. Call your health care provider if it stays high.
- Take your blood pressure medicine as ordered. Continue to take your medicine even if you feel well and your blood pressure is normal.
- Lose weight if you are overweight.
- Limit sodium in your foods and drinks.
- Stop tobacco use and limit alcohol.
- Aim to be active at least 30 minutes a day.
- Practice relaxation daily to reduce stress.

Cholesterol and triglycerides

Cholesterol and triglycerides are different types of fats found in your blood. Too much cholesterol or triglycerides in your blood can be harmful and increase your risk for heart disease and stroke.

Get your cholesterol and triglycerides tested at least every year. Your cardiologist may recommend that you be tested every six months. If you are taking cholesterol lowering medicine, get your liver function tested as well.

- **Total cholesterol** is a measure of the total amount of cholesterol in your blood and is based on HDL, LDL and triglycerides numbers (HDL + LDL + 20 percent of your triglycerides level). **A healthy level is below 200.**
- **LDL cholesterol** makes up the majority of your body's cholesterol. It is known as "bad" cholesterol because it causes plaque to build up on artery walls, making it hard for blood to flow. The higher the level of LDL cholesterol in your blood, the greater your risk of heart disease and stroke. **A healthy level is less than 70.**
- **HDL cholesterol** carries extra cholesterol away from your arteries and back to your liver, which flushes it from your body. It is known as "good" cholesterol because having high levels can reduce your risk of heart disease and stroke. **A healthy level is at least 40 for men and at least 50 for women. An HDL above 60 is optimal for cardiovascular health.**
- **Triglycerides** are a type of fat found in the blood that your body uses for energy. The combination of high level of triglycerides with low HDL cholesterol or high LDL cholesterol can increase your risk for heart disease and stroke. High triglycerides can also be caused by poorly controlled diabetes. **A healthy level is less than 150.**

  Your triglycerides may be high if you regularly eat more calories, like carbohydrates and fats, than your body needs for energy. Examples of foods that increase triglycerides include:

  - Alcohol: Beer, wine, hard liquor and liqueurs.
  - Sugar: Concentrated sweets, such as sugar, honey, molasses, jams, jellies and candy. Desserts, such as pies, cakes, cookies, candy, doughnuts, ice cream, frozen yogurt and sweetened gelatin.
  - Starch: Concentrated starchy foods, such as bagels, pasta, rice, potatoes, large rolls, pizza, pretzels, popcorn, chips, many fat-free foods and ready-to-eat cereals. Choose small portions of these due to their high carbohydrate density. Choose whole grains and legumes (starchy beans) over refined starches.

- Saturated fats: Fats solid at room temperature, including animal fats, lard, butter and shortening. Also, fried foods, whole milk, whole milk dairy products, cheese, cream cheese, high-fat meats and fast foods.
- Trans fats: Hydrogenated fats found in margarine, vegetable shortening, fried foods, fast foods and most commercial snack foods, such as pastries, cakes, pies and crackers.

Lowering your cholesterol and triglycerides

- Take your cholesterol lowering medicine as ordered.
- Eat a heart healthy diet that is low in fat and cholesterol and high in fiber.
  - Limit foods that contain high amounts of cholesterol, such as beef, pork, butter, cheese, egg yolks and whole milk.
  - Eat foods high in fiber, such as whole grains, beans, fruit and vegetables. Fiber helps to block cholesterol and fats from being absorbed through the wall of your intestines and into your blood stream.
  - Bake, grill, or roast foods instead of frying them.
- Exercise at least 30 minutes a day, 5 days a week.

Quitting tobacco use

Cigarettes, cigars, pipes and smokeless tobacco all expose the body to toxic chemicals and make it harder for the body to get enough oxygen. The more you use, the greater your risk for:

- High blood pressure
- Blood clots that can lead to a heart attack or stroke
- Cardiovascular disease where the blood vessels and arteries of the body get blocked or narrow
- Cancer, including cancer of the lungs, liver, throat, trachea (airway), larynx (voice box) and others
- Diseases, such as emphysema or chronic bronchitis, that make it hard to breathe and get enough oxygen
- Heart disease and heart attacks
- Type 2 diabetes
- Other problems, including vision loss, bone loss, or problems with pregnancy or reproduction

The 5 steps to quitting tobacco

1. Set a quit date.
2. Tell family and friends you plan to quit. Having support is key to successful quitting.
3. Prepare for your quit date. Buy gum, throw away tobacco products, clean your home and car, and visit your dentist to clean your teeth of tobacco stains.
4. Talk to your health care provider or pharmacist about quit aids, nicotine replacement products and support groups.
5. Plan a reward system for quitting. Reward yourself for choosing healthy behaviors that replace tobacco use and for meeting certain milestones, such as 1 day, 1 week, 1 month, 3 months and 6 months.

Resources to quit

Ohio State resources

- If you have an Ohio State primary care doctor, talk to your doctor about a referral to the office's pharmacist for smoking cessation counseling. Ohio State's family medicine and internal medicine doctors are your health partners to quit tobacco use.
- You may also call **614-293-QUIT (7848)** to connect with a pharmacist for one-on-one assessment, counseling and treatment. For more information about this program, please visit https://wexnermedical.osu.edu/heart-vascular/clinical-pharmacist-services/smoking-cessation.
- ***Quitting Tobacco Use* Book:** Available from your health care provider or visit https://go.osu.edu/pted3430.

Quit lines

- **American Cancer Society**, 800-227-2345
- **American Lung Association**, 1-800-LUNGUSA (1-800-586-4872)
- **BeTobaccoFree.gov**, 877-448-7848
- **Ohio Tobacco Quit Line**, 1-800-QUIT-NOW (1-800-784-8669)

Mobile apps

- Search your mobile device's app store for quit smoking apps, such as **QuitGuide** and **QuitSTART**.

Maintaining a healthy weight

Maintaining a healthy weight is important for overall health. It can help you prevent and control many diseases and conditions, such as heart disease, high blood pressure, type 2 diabetes, gallstones, breathing problems and certain cancers. If you need to lose weight, losing just 5 to 10 percent of your current weight over 6 months will lower your risk for heart disease and other conditions.

To control your weight:

- **Keep snacking in check.** Keep snacks between meals to 200 to 300 calories. Choose a serving of fruit or vegetables plus a protein, like peanut butter or hummus.
- **Keep serving sizes moderate.** Practice portion control and avoid second helpings.
- **Satisfy your appetite** with raw vegetables, raw fruits, water and other calorie-free beverages. Pick caffeeine-free beverages as your doctor or dietitian directs.
- **Do not skip meals** to avoid overeating at the next meal.
- **Eat mindfully.** Keep distractions to a minimum while eating and focus on your food. Tune into your body and stop eating when you feel full. Pay attention to whether you are eating out of hunger or to satisfy an emotion.
- **If you have diabetes, eat to control your blood sugar levels.** Limit total calories and high amounts of carbohydrates to keep your blood sugar levels in control.
- **Be active every day** to help your body burn stored calories.

Be active every day

Health experts recommend that adults be active at least 150 minutes per week, or 2 hours and 30 minutes. This may sound like a lot, but you can break it up into bouts as short as 10 minutes if needed. Try some of these tips to build more exercise and activity into your day.

Learn more about how to safely be active later in this book.

Diabetes

Diabetes results in high blood sugar levels (glucose). Diabetes occurs when the pancreas does not produce enough insulin or the body cannot use insulin properly. With diabetes, there is an abnormal amount of lipoprotein, which speeds up atherosclerosis and raises the risk of heart attack. Having high blood pressure and being overweight are more common in people with diabetes.

To control diabetes

- Check your glucose levels at home and try to keep them as close to normal as possible.
- Follow your meal plan as prescribed.
- Take medicines as prescribed.
- Control your weight.
- Exercise regularly.

Diet and alcohol use

Eat a healthy diet with fruits, vegetables, whole grains, fat-free or low-fat milk products, and plant-based protein or lean cuts of meat.

- Choose foods low in saturated fats, cholesterol, sodium and added sugars.
- Read food labels and plan for low sodium meals and snacks. Cook at home and use herbs and spices for great tasting meals instead of pre-packaged meals or processed foods.

Limit alcohol use. If you do choose to drink, limit to 1 drink a day (women) or 2 drinks a day (men).

More about diet choices later in this book.

Stress and tension

Stress is a normal part of our lives. Stress causes the release of adrenalin, which speeds up your heart rate, narrows your blood vessels and increases your blood pressure. Stress makes you heart work harder. **It is not the stressful situation, but your reaction to stress that is important.**

People who feel time pressures and who are hard-driving are more prone to heart disease. Those who are calm, unhurried and easy-going are at less risk.

Suggestions to reduce stress

- Identify events in your life that create stress and how you respond to it.
- Avoid things that cause stress, if possible.
- Learn stress management techniques, such as journaling, yoga and listening to music.
- When you cannot avoid stressful situations, choose to respond in a way that is less stressful for you.
- Exercise regularly.

Starting Your Home Exercise Program

Regular exercise will improve your recovery and future health. To get the most benefit, work with your doctor or therapist to create an exercise plan.

Benefit without straining

When starting an exercise program, the goal is to **slowly** improve your heart and lungs. There are three things to keep in mind as you start to exercise:

- How hard you exercise, also called intensity.
- How often you exercise, also called frequency.
- How long you exercise, also called duration.

How Hard (Intensity)

You want to exercise enough to benefit your heart, but without straining. Pay attention to how your body feels. You are working too hard if you have trouble breathing or you feel weak, faint or dizzy during or after exercising.

How Often (Frequency)

How often you exercise can change based on how long you will do it for. Start with 2 to 3 short walks each day for 10 minutes. As you are able to walk for longer periods of time, you may walk fewer times each day. It is best if you can exercise at least 5 days a week.

How Long (Duration)

How long you exercise may start as only a few minutes. Add a few minutes each day. A goal over time is to be able to exercise for 30 to 60 minutes per day.

Types of exercise

There are different types of exercise that are good for your health. Vary the type of exercise you do to increase the health benefits and prevent boredom and injury. Talk to your doctor about what type and how much exercise is right for you before starting any exercise program.

Aerobic Exercise

Aerobic exercises, also know as “cardio” exercise, moves large muscles and increases the heart rate for a period of time. This promotes more use of oxygen to stimulate and strengthen the heart and lungs.

Examples include: walking, running, aerobic classes, stair climbing, biking and swimming.

Strength Training Exercise

Strength training exercises increase strength and build strong bones and muscles. Weight lifting, push-ups and sit-ups are examples of strength training.

Talk to your doctor before beginning strength training if you have high blood pressure or other health problems. People with heart failure should not do strength training.

Stretching Exercise

Stretching exercises increase the length of the muscles, which improves balance and joint health. Stretching is important before and after exercising and as an exercise itself. Examples include stretching exercises, yoga and tai chi.

Do at least a 5 minute warm up, such as walking, before stretching to reduce risk of muscle strain.

Hold each stretch for 20 to 30 seconds.

If you have heart failure

If you have heart failure, **avoid weight lifting and strength training**, also called isometric exercises. Examples are pushing, pulling, lifting and carrying. These types of exercises can raise your blood pressure and put more strain on your heart.

Aerobic exercise and stretching are still important to do if you have heart failure.

Tips to put less stress on your heart

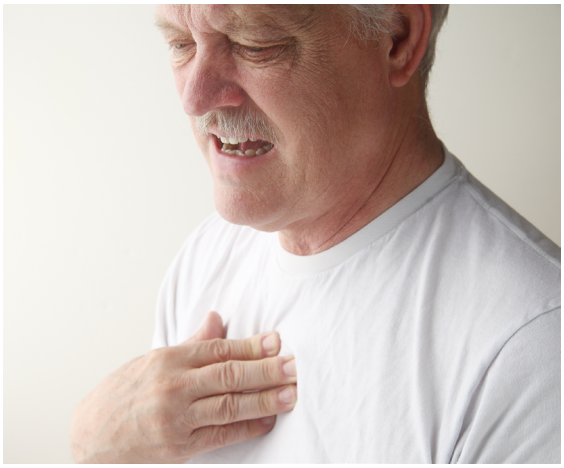
- Begin and end with 5 minutes of gentle, stretching exercises or use this time to slowly increase or decrease the exercise. For example, walk 5 minutes before and after jogging. Warming up helps prevent irregular heartbeats and injuries, and lessens strain on the heart.
- Exercise at a comfortable pace, slowly building up your level of activity over weeks.
- Drink water before, during and after exercise.
- Cool down at the end of your exercise. This helps prevent strain on the heart, large drops in blood pressure and light-headedness from stopping suddenly.
- Exercise after you are rested, not when you are tired from other activities.
- In hot or humid weather, exercise in the morning or evening when it is cooler. In cold weather, cover your nose and mouth with a scarf.
- Walk in a mall or fitness center when the temperature is above 85 degrees Fahrenheit. This is also a good idea when the temperature is cold, below 32 degrees.
- Wear loose, comfortable clothing when you exercise. Wear light layers that you can put on or take off as you warm up or cool down.

Pacing Your Activity

Effort signs

Signals that show your heart is working too hard are called **effort symptoms or signs**. These include:

- Shortness of breath
- Dizziness
- Irregular pulse (not steady)
- Chest discomfort or pain
- Nausea



If you have one or more of these signs, **stop your activity and rest.** Be sure to tell your nurse or cardiac rehabilitation specialist. It is not unusual to have muscle or incision discomfort in your chest during activity. Over time, the discomfort should decrease.

Rating how you feel

Rating how you feel during exercise can be used to check if your heart is working too hard. When you are doing activities or exercise, you should be able to talk easily and not feel out of breath.

Your heart rate (pulse) can be used as a guide for how hard your heart is working.

- Before doing your exercise, check your heart rate.
- After doing exercise, stop and check your heart rate again. **Your heart rate should not be more than 20 beats a minute above your resting heart rate.** See below for how to find resting heart rate.
- If it is too high, rest and recheck it in 5 minutes. A large increase in heart rate can be a sign that you did more activity than your heart was ready for on that day.
- If your heart rate regularly goes above the target rate or if you feel effort signs with a rise in heart rate, talk about this with your health care team. There may be other things causing your heart rate to go up.

If you start an outpatient program, you will be given a target heart rate range to meet, which may be more than 20 beats a minute.

Finding Your Heart Rate

Determine your **resting heart rate.** Take your pulse before you get out of bed in the morning:

- Find your pulse on your wrist. Use the tips of two fingers to apply light pressure on the thumb side of the wrist.
- Count your pulse for 10 seconds and then multiply that number by 6.
- **My resting heart rate is _____.**

During exercise:

1. Warm up for 5 minutes then check your heart rate. Exercise at 20 beats above your resting heart rate. Slow down if your heart rate is too high. **My heart rate goal for exercise is _____ to _____.**
2. End with a 5 minute cool down and then check your heart rate. Your heart rate should be within 10 beats of your resting heart rate. If it is too high, continue to cool down. **My heart rate should cool down to at least _____.**

Borg Rating of Perceived Exertion (RPE) Scale

This scale rates how hard you are working. It lets us know how the exercise feels to you.

A rating between 11 and 14 is a safe level of exertion. This means you are comfortably tired after an activity. If your rating is less than 11, it is safe for you to increase your intensity (pace) or exercise longer. If your rating is greater than a 14, slow down.

#	Level of Exertion
6	No exertion at all
7	
7.5	Extremely light (7.5)
8	
9	Very light
10	
11	Light
12	
13	Somewhat hard
14	
15	Hard (heavy)
16	
17	Very hard
18	
19	Extremely hard
20	Maximal exertion

9 on the scale is “very light” exercise. It is like walking slowly at your own pace for some minutes

13 on the scale is “somewhat hard” exercise. It still feels okay to continue.

17 on the scale is “very hard” exercise. You can still go on, but you really have to push yourself. It feels very heavy, and you are very tired.

19 on the scale is “extremely hard” exercise. This is the most strenuous exercise you have ever done.

Borg RPE scale

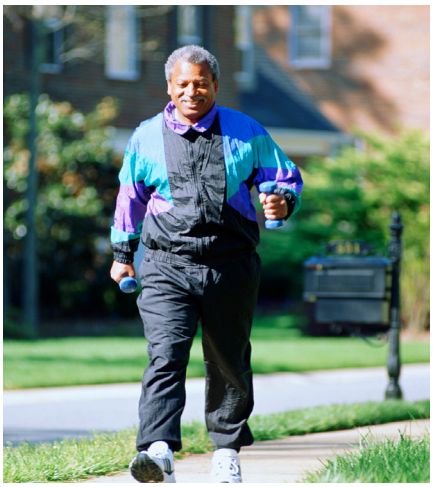
Watch for warning signs

Know the signs to watch for that you are exercising too hard:

- Pain or pressure in your chest, down your arms or shoulders, or in your throat or jaw
- Irregular, skipped or fast heart beats
- Extreme fatigue or shortness of breath
- Blurred vision
- Sudden weakness in face, arm or leg
- Severe leg pain with exercise
- Feeling light-headed, dizziness or confused
- Consistent sore muscles

If you experience any of these warning signs, you are exercising too hard. **Stop exercising and rest!** Talk to your doctor, nurse or cardiac rehab therapist about what your signs were and what you were doing.

Eight-Week Walking Program



This program starts slowly to rebuild your strength and stamina. You will walk short distances and then rest. This is called interval training. Your speed or pace when walking will slowly increase over time.

Walk at a pace that does not leave you out of breath. Only move to the next level if you feel you can. It is okay to repeat a week if the effort needed is moderately difficult for you to achieve. The goal is to increase activity safely for your body.
Talk to your doctor about how much exercise is right for you before starting any exercise program.

Week #	Walking interval	Rest interval	Repeat the intervals	Total activity time (minutes)
1	2 minutes	1 minute	5 times	10
2	4 minutes	2 minutes	4 times	16
3	5 minutes	2 minutes	4 times	20
4	7 minutes	2 minutes	3 times	21
5	5 minutes	2 minutes	5 times	25
6	10 minutes	2 minutes	3 times	30
7	15 minutes	2 minutes	2 times	30
8	20 minutes	2 minutes	2 times	40

If you have any of the warning signs lists above, stop exercising and seek medical help.

Heart Healthy Eating with DASH

DASH, or Dietary Approaches to Stop Hypertension, is an eating plan that lowers blood pressure and LDL (bad) cholesterol to reduce your risk of getting heart disease. Your health care provider may also recommend DASH to prevent or control other diseases and conditions, such as stroke, type 2 diabetes, and kidney stones.

Along with DASH, other lifestyle changes can help improve your health. They include staying at a healthy weight, exercising, and not smoking.

Talk to your provider for support as you make changes to your diet and lifestyle.

Follow the DASH eating plan

The food groups listed show examples of daily or weekly servings for a 2,000-calorie-a-day diet. You may need more or less servings each day based on your calorie (energy) needs. Talk to your provider for support.

Sodium - limit to 2,300 mg or less per day

Your provider may recommend 1,500 mg or less per day.

- 1 teaspoon of salt has about 2,300 mg of sodium.
- Most of the sodium in our diets comes from processed foods, like lunch meat, canned soups and vegetables, and boxed or packaged mixes.
- Read food labels to learn how much sodium is in a food.

Grains - eat 6 to 8 servings per day

- 1 serving equals:
  - 1 slice of bread
  - 1 ounce of dry cereal (about 1/2 to 1 1/4 cups, depending on cereal type)
  - 1/2 cup of cooked rice, pasta, grains, or cereal
- Choose whole grains (100% whole wheat or whole grain bread, brown rice, quinoa, or oatmeal) over refined grains (white flour, degermed cornmeal, white bread, or white rice).

Vegetables - eat 4 to 5 servings per day

- 1 serving equals:
  - 1 cup raw, leafy vegetables
  - 1/2 cup chopped raw or cooked vegetables
  - 1/2 cup low-sodium vegetable juice

Fruits - eat 4 to 5 servings per day

- 1 serving equals:
  - 1 medium fruit
  - 1/4 cup dried fruit
  - 1/2 cup fresh, frozen, or canned fruit
  - 1/2 cup fruit juice
- Choose whole fruits (fresh, frozen, or dried) over juice.

Fat-free or low-fat dairy - eat 2 to 3 servings per day

- 1 serving equals:
  - 1 cup fat-free or 1% low-fat milk
  - 1 1/2 ounces low-fat cheese
  - 6 ounces fat-free or low-fat yogurt

Lean meats, poultry, and fish - eat 6 to 8 servings per day

- 1 serving equals:
  - 1 ounce cooked meat, fish, or poultry
  - 1 egg
- Trim away visible fat.
- Remove skin from poultry.
- Use low-fat cooking methods, like broil, roast, poach, bake, and grill.
- Limit meat to 3 ounces at meals (about the size of the palm of your hand).
- Limit egg yolks to 4 per week.

Fats and oils - eat 2 to 3 servings per day

- 1 serving equals:
  - 1 teaspoon butter, margarine, or oil
  - 1 tablespoon mayonnaise
  - 2 tablespoons salad dressing
- Use small amounts of butter or margarine.
- Use olive oil as your first choice for oils.

Seeds, nuts, and legumes (beans, lentils, and peas) - eat 4 to 5 servings per week

- 1 serving equals:
  - 1/3 cup or 1 1/2 ounces of nuts
  - 2 tablespoons nut butter
  - 2 tablespoons or 1/2 ounce seeds
  - 1/2 cup cooked beans, lentils, or peas
- Eat more vegetarian or meatless meals.

Sweets and added sugars - eat 5 or less servings per week

- 1 serving equals:
  - 1 tablespoon of sugar, honey, maple syrup, or chocolate sauce
  - 1 tablespoon jelly or jam
  - 1/2 cup sorbet, sherbert, or ice cream
  - 2 small cookies
- Keep sugar on the food label to less than 10 grams per serving.
- Men: limit sugar to no more than 150 calories or about 3 tablespoons (38 grams) per day.
- Women: limit sugar to no more than 100 calories or about 2 tablespoons (25 grams) per day.
- A 12-ounce can of regular soda has about 40 grams of sugar!

For more information about DASH, visit:

- National Heart, Lung, and Blood Institute at www.nhlbi.nih.gov/health/health-topics/topics/dash
- MedlinePlus at https://medlineplus.gov/dashdiet.html

DASH 2-day sample menu	
Day 1	**Day 2**
Breakfast	**Breakfast**
1 cup bran flakes cereal	1/2 cup oatmeal
1 medium banana	1 mini 100% whole wheat bagel
1 cup 1% low-fat milk	1 tablespoon peanut butter
1 slice 100% whole wheat bread	1 medium apple or 1 cup other whole fruit
1 teaspoon butter or soft margarine	1 cup 1% low-fat milk
1/2 cup orange juice or orange segments	
Lunch	**Lunch**
3/4 cup chicken salad on 2 slices 100% whole wheat bread	Chicken breast sandwich with 3 ounces skinless chicken breast, 2 slices 100% whole wheat bread, 1 slice low-fat cheddar cheese, 1 large romaine leaf, 2 slices tomato, 1 tablespoon low-fat mayonnaise
Salad with 1/2 cup fresh cucumber slices, 1/2 cup tomato wedges, 1 tablespoon sunflower seeds, 1 teaspoon Italian dressing	1 cup canteloupe chunks
1/2 cup fruit cocktail	
Dinner	**Dinner**
3 ounces lean beef with 2 tablespoons fat-free beef gravy	1 cup whole grain spaghetti with 3/4 cup spaghetti sauce (with no meat and less than 10 grams of sugar per serving), and 3 tablespoons Parmesan cheese
1 cup green beans sauteed in 1/2 teaspoon olive oil	Spinach salad with 1 cup spinach leaves, 1/4 cup fresh grated carrots, 1/4 cup sliced mushrooms, 1 tablespoon vinaigrette dressing
1 small baked potato topped with 1 tablespoon fat-free sour cream, 1 tablespoon low-fat shredded cheddar cheese, 1 tablespoon chopped scallions	1/2 cup corn, cooked from frozen
1 small whole wheat roll with 1 teaspoon tub margarine	1/2 cup fresh or canned pears
1 small apple	
1 cup 1% low-fat milk	
Snack	**Snack**
1/3 cup almonds, unsalted	1/3 cup walnuts, unsalted
1/4 cup raisins	1/2 cup applesauce
1/2 cup low-fat, low-sugar Greek yogurt	1 low-fat mozzarella string cheese

Making Restaurant Choices

Restaurant foods are often high in calories, fat, and sodium. Here are some other tips to help you make heart healthy choices.

Overall tips

- Restaurant meal portions are enough to feed at least 2 people. Split a meal with another person, or take at least half of the meal home for leftovers.
- Choose lean cuts of meat (round, sirloin, tenderloin cuts), fish, or poultry prepared with no added fat. Broiling, poached, grilled, baked, and roasted are usually good choices.
- Ask for sauces, gravies, margarine, butter, salad dressing, and sour cream on the side. Use small amounts of these for flavor. Dip your fork in them before getting your bite of food.
- To reduce sodium, ask that foods be prepared without salt when possible. Avoid soy sauce and teriyaki sauce, which contain very large amounts of sodium.

Restaurant foods to choose

The following pages have lists with some key words to help you choose **lower fat food options** in various types of restaurants. However, some low fat foods are very high in sodium. If you need to limit your sodium, avoid those marked as such.

Type of Food	Choose These Foods	Limit These Foods
American	• BBQ sauce (high sodium) • Cocktail sauce (high sodium) • Green or red onions • Honey mustard • Lettuce and tomatoes • Mustard • Sautéed onions, peppers or mushrooms (with little or no oil) • Foods that are mesquite marinated, grilled, charbroiled or broiled	• Bacon (strips, crisps or crumbled) • Blue cheese • Butter or garlic butter • Cheese (grated, melted, topped or smothered) • Guacamole • Sausage • Sour cream • Food that is battered or fried • Food that is described as large, jumbo, piled high, stacked, layered or stuffed

Type of Food	Choose These Foods	Limit These Foods
Chinese	• Assorted vegetables • Bean curd • Light wine sauce • Sizzling platter • Foods that are simmered, steamed, roasted or stir-fried	• Duck • Egg Foo Young with cashews • Hoisin sauce • Foods that are breaded, fried or crispy
Italian	• Artichoke hearts • Capers • Florentine • Herbs and spices • Light red or wine sauce • Mushrooms • Peppers • Primavera • Shallots or onions • Sun-dried tomatoes • Foods that are sautéed or grilled	• Alfredo sauce • Cannelloni • Pasta alla Carbonara • Creamy sauce • Egg and cheese batter • Manicotti • Oil • Pancetta • Parmigiana • Prosciutto • Saltimbocca • Veal sausage • Foods that are stuffed with cheese or fried
Mexican	• Enchilada sauce • Lettuce and tomatoes • Mole sauce • Picante sauce (high sodium in large amounts) • Salsa (high sodium in large amounts) • Soft corn tortillas • Spicy beef or chicken • Foods that are grilled, marinated or simmered • Guacamole (eat in small amounts - high in fat but healthy monounsaturated fat)	• Bacon • Cheese sauce • Chorizo • Fried taco bowls • Refried beans • Sour cream • Tortilla chips • Foods that are covered with cheese or fried

Using Food Labels to Make Healthier Choices

Claims on food packages can be confusing. Knowing what is in food may help you to make healthier choices. Reading food labels is the best way to get information about what is in your foods. This can help you make better choices and eat healthier overall.

Nutrition Facts

1. **Look for the Nutrition Facts on the food label.** The numbers on this illustration match the numbers in the Nutrition Facts section of this handout. Refer back to this page as you learn what each item means.
2. **Serving Size:** The amount of food recommended to be eaten at one time. All of the following nutrition information is based on this serving size. For instance, if you ate 2 servings, you would need to double the numbers listed below. Also note how many servings are in the entire container to help estimate what one serving size looks like.
3. **Calories:** The average adult needs about 2,000 calories a day from food and beverages. Use this number to help determine if this product fits into your daily eating plan or not. Too many calories each day can lead to weight gain.
4. **Fat:** Not all fat is created equal. There are 4 types of fat in our foods: saturated fat, trans fat, monounsaturated fat, and polyunsaturated fat. The FDA only requires that food manufacturers list saturated fat and trans fat on their Nutrition Facts labels, but sometimes you might find all 4 types listed.

Too much saturated fat or trans fat in the diet can lead to worsening heart problems or cancer.

Nutrition Facts

6 servings per container

Serving size 1 cup (140g)

Amount per serving

Calories 170

	% Daily Value*
Total Fat 8g	10%
Saturated Fat 3g	15%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 5mg	0%
Total Carbohydate 22g	8%
Dietary Fiber 2g	7%
Total Sugars 16g	
Includes 8g Added Sugars	16%
Protein 2g	
Vitamin D 0mcg	0%
Calcium 20mg	2%
Iron 1mg	6%
Potassium 240mg	6%

*The % Daily Value tells you how much a nutient in a serving of food contributes to a daily diet 2000 calories a day is used for general nutrition advice.

Source: Adapted from U.S. Food and Drug Administration

An average adult following a 2000 calorie diet should aim to limit total fat to 45 to 75 grams per day (20-35% total calories), saturated fat to 11 to 13 grams per day (5-6% total calories), and trans fat should be avoided as much as possible. Check the list below to see how much you should have if you eat a different amount of calories per day.

If your daily **calorie total** is:	Your **total fat** limit fat per day is:	Your **saturated fat** limit per day is:
2000 calories	45 to 75 grams	11 to 13 grams
1800 calories	40 to 70 grams	10 to 12 grams
1500 calories	35 to 60 grams	8 to 10 grams
1200 calories	25 to 45 grams	6 to 8 grams

Note: Although the food label may say the food item has 0 grams of trans fat, it may contain up to 0.5 gram per serving. The best way to check for trans fats is to look at the ingredient list and look for "partially hydrogenated oils." If you see these words, try to find an alternative product made with different ingredients.

5. **Cholesterol:** Cholesterol is found in animal products, such as cheese, egg yolks, milk, and butter. Eating too many of these foods can increase your risk for heart disease. Try to limit total cholesterol intake to 300 mg per day. If you are at risk for heart disease or have Type 2 Diabetes, 200 mg per day is the maximum recommended amount. Plant-based foods do not contain any cholesterol.

6. **Sodium:** Many processed foods contain sodium, which acts as a preservative and adds flavor. Most Americans are eating too much sodium. Keeping your sodium intake low may decrease high blood pressure and lower your risk for stroke, heart disease, and kidney disease. The 2015 Dietary Guidelines for Americans suggests limiting sodium intake to no more than 2,300 mg per day, although some older individuals or those with high blood pressure may want to limit this intake even more.

   Guideline: Look for foods that have less than 300 mg of sodium per serving. Watch the number of servings of any food you eat.

7. **Total Carbohydrates:** Carbohydrates are in foods like bread, pasta, potatoes, fruits, and vegetables. Some individuals, like those with diabetes, may want to control the amount of carbohydrate that they have with their meals and snacks.

8. **Dietary Fiber:** Fiber is the bulk part of grains, beans, peas, fruits and vegetables. Fiber helps the body's digestive system work well and may help lower the risk of some cancers and heart disease. If you want to increase your fiber intake, look for foods with at least 3 grams of fiber per serving.

9. **Added Sugar:** Some sugars are naturally occurring, like those in fruit, and others are added during the processing or packaging of foods. Too many of these "added sugars" can increase your risk for developing diabetes, heart disease, obesity, and other health conditions. Aim to limit added sugar intake to 10% of total calories, or about 30 to 55 grams per day for most people. Make sure to check beverages for added sugar content.

10. **Protein:** Protein can help to build muscle, regulate hormones, and is involved in immune function. Most individuals should aim for about 60 to 100 grams of protein per day.

11. **Vitamins and Minerals:** Most Americans are not meeting the recommended amount of these nutrients each day. Look for food products that are a good source of these nutrients. Your goal is to reach 100% of each for the day.

12. **% Daily Value:** Daily values are the percentage of nutrients the product provides based on a diet of 2,000 calories per day. Your nutrient needs may be less or more than the Daily Value depending on your individual health concerns. For certain nutrients, like sodium and added sugar, aim for lower percentages. For other nutrients, like fiber, vitamins, and minerals, aim for 100% a day.

The Ingredient List

In addition to the Nutrition Facts Label, look at a product's ingredient list to help you make better food selections. The ingredient list tells you what is in the food. Manufacturers list ingredients by weight in order of greatest amount to least amount in the food. It is a valuable resource for people with food allergies. Use the table to help you identify ingredients that are high in a nutrient.

Nutrient	Common Ingredients	
Sodium	• Baking powder • Baking soda • Monosodium glutamate	• Salt (regular or sea salt) • Sodium
Cholesterol	• Any animal fats • Lard	• High fat products, such as whole milk and cheese
Saturated and Trans Fats	• Any animal fats except fish • Coconut butter • Coconut oil	• Palm oil • Partially hydrogenated oils
Sugar	• Brown sugar • Carob powder • Corn syrup/solids • Dextrin • Dextrose • Fructose • Glucose	• High fructose corn syrup • Honey • Invert sugar • Lactose • Mannose • Molasses • Sucrose

Relaxation Techniques

Learn relaxation techniques to reduce stress and anxiety. Try different techniques to find what works best for you. Practice your techniques often and your ability to relax will improve over time.

Listening to music

Listen to your favorite music by itself or play music while using another relaxation technique. Look for new music, which you find soothing and helps you feel calm and relaxed, such as classical music or nature sounds. Try also guided meditation music.

Breathing exercises

1. Find a quiet room.
2. Turn on music that you find relaxing.
3. Get into a relaxing position.
4. Close your eyes and think of an image in your mind that will help you to relax, such as a calm, peaceful setting or a place you have enjoyed visiting.
5. Breathe in deeply. Hold your breath and tense your muscles. Keep them tense for a second or two.
6. Relax your muscles as you breathe out.
7. Starting with the muscles in your lower legs, work your way up your body to your head, tightening and relaxing each muscle group.

Guided imagery

Close your eyes and think of a time and place when you felt safe and comfortable. Imagine those surroundings, sights, smells, and sounds. Bring as much of that experience back to the here and now as possible. When you feel ready, take a deep breath and open your eyes.

Aromatherapy

Aromatherapy is the use of essential oils from plants as therapy to improve your well-being. Some oils, such as lavender, are thought to produce a calming effect. They can be inhaled or diluted and used on skin.

Positive thinking

Thinking negative thoughts can cause stress and muscle tension. Create some positive statements to replace negative self-talk. Repeat these statements to yourself and use them to motivate you. Some examples:

- I am doing the best that I can.
- I care for my well-being.
- I will try again.

Relaxation resources

- **Guided Imagery Exercises**
  go.osu.edu/guidedimagerypractices
- **Mindfulness**
  go.osu.edu/mindfulness
- **Heart Centered Practices**
  go.osu.edu/heartpractices
- **Relaxation Response**
  go.osu.edu/relaxationresponse

Cardiac Rehabilitation Program

Our goal is to help you return to the highest possible quality of life. Cardiac rehabilitation works to address activity and lifestyle after you leave the hospital. It is offered in several phases.

Phase 1 (inpatient)

We provide education during your hospital stay and work with you on skills to keep you active when going home. Before you leave the hospital, we will also provide a referral for a local cardiac rehab program.

Phase 2 (outpatient)

After leaving the hospital, you will have a visit to check your heart health with a cardiac rehab nurse and exercise physiologist. After this evaluation, which may include testing, you will start a personalized wellness program. These are some of the skills covered:

- Learn more about your condition and know how to best manage your condition at home.
- Improve your heart and cardiovascular function.
- Improve your fitness level.
- Reduce the chance of future health problems by working to improve diet, weight, activity level, diabetes and/or cholesterol, stop tobacco use and manage stress.
- Ability to do daily activities without symptoms.
- Reduce fear or anxiety about your heart condition.
- Have a faster return to work and/or normal activities.

Phase 3 (maintenance)

This is an ongoing fitness and wellness program that continues at the end of Phase 2 cardiac rehab. The program will support you as you work toward your health, fitness and lifestyle goals.

If you would like to attend the program, you can ask for a referral from your doctor.

Cardiac rehabilitation is offered at two locations:

Ohio State Outpatient Care
Upper Arlington

1800 Zollinger Road, 2nd Floor
Columbus, OH 43221
Phone: 614-293-6937

Ohio State Outpatient Care
East (Phase 2 only)

543 Taylor Ave, Room 3068
Columbus, OH 43203
Phone: 614-688-6306

Resources

Community resources

Look for resources in your community to help you during your recovery:

- Local cardiac rehabilitation programs
- Your local doctor
- YMCA
- Local hospital community health education programs
- Local American Heart Association
- School adult education programs
- Mental health clinics
- Churches and synagogues
- Local department of health
- Home health nursing

LSS (Lutheran Social Services) 211 Central Ohio (formerly HandsOn)
Call 211 or visit https://lssnetworkofhope.org/211centralohio/
Reach thousands of social service, government, and community resources in Franklin County.

Heart healthy recipes

American Dietetic Association
www.eatright.org

American Heart Association, www.heart.org
Select "Healthy Living" from the menu bar

Cooking Light, www.cookinglight.com

EatingWell, www.eatingwell.com

Organizations

American Heart Association
www.americanheart.org / 1-800-AHA-USA1
Central Ohio Office: (614) 848-6676
5455 North High St, Columbus, Ohio 43214
Information about heart disease, care, and how to prevent disease. There are links to podcasts, online videos, and articles.

WomenHeart
www.womenheart.org
This Web site is organized by women who have survived heart disease. Medical experts provide disease care and prevention information. There are links to online chat and survivor stories.

National Heart, Lung, and Blood Institute
www.nhlbi.nih.gov
The U.S. National Institutes of Health sponsors this web site, which has trustworthy and up-to-date information about the disease, treatment, and prevention.

Support and mental health

Call Social Work at 614-293-8427
A social worker will answer questions about insurance, finances, support groups and getting to clinic appointments. The social worker also will help you contact agencies near you.

Ohio State's Couple and Family Therapy Clinic can help you adjust to lifestyle changes, manage stress and connect with resources of support. For more information, call 614-247-7883.

Weight loss / management

Ohio State's Comprehensive Weight Management, Metabolic and Bariatric Surgery
Programs designed to meet your needs for weight loss or management.
wexnermedical.osu.edu/weight-management

THE OHIO STATE UNIVERSITY

WEXNER MEDICAL CENTER

wexnermedical.osu.edu