

Cardiac Surgery Patient Education

JOHN MUIR HEALTH

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Our Cardiovascular Institute is led by a dedicated care team focused on listening to your needs, explaining each step of treatment, and working together with you to ensure you receive the highest quality care.

This guide has been created to help answer questions that you and your family may have about heart surgery. Always follow your doctor's specific instructions if they differ in any way from those listed here.

Remember that at John Muir Health, we listen, explain, and work together as a team to help care for you. Thank you for choosing John Muir Health.

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Diabetes Center	(925) 941-5076

Heart

Heart

All you need to know about your Heart

Taking An Active Role

Learning about your heart will help you understand its role in your overall health. This will allow you to become more active in your care. Your health care team of doctors, nurses, dieticians, physical therapists, pharmacists, case managers and many more are all dedicated to teaching you and your family about healthy living. Please read through this information and take it home for future reference.

Undergoing heart surgery may be frightening. With the information in this binder you can understand how the heart works, how disease affects it, and what to expect during your hospital stay and recovery. This information plays an important role in making you feel more confident about resuming your normal activities.

About Your Heart

Your heart is an amazing organ. Shaped like an upside-down pear, this fist sized powerhouse pumps five or six quarts of blood each minute throughout your body. Your heart lies in the center of the chest and is tilted slightly to the left.

Your heart pumps blood through blood vessels that carry the blood throughout the body. Blood is essential because it carries oxygen and nutrients to your body's tissues and takes carbon dioxide and waste products away from the tissues. This is needed to keep your body's tissues alive and functioning. Blood flows continuously through your body's blood vessels. Your heart is the pump that makes it all possible!

Arteries carry oxygen rich blood away from the heart. As they carry blood further from the heart, the arteries branch several times, becoming smaller and smaller until they become capillaries. From the capillaries blood flows into tiny veins. Veins take oxygen poor blood back to the heart. As they get closer to the heart, the veins become larger and larger until they empty the blood into the heart.

The heart is divided into 4 chambers. Two upper chambers (atria) receive blood from veins. Two lower chambers (ventricles) pump blood out of the heart.

What Are The Heart Valves?

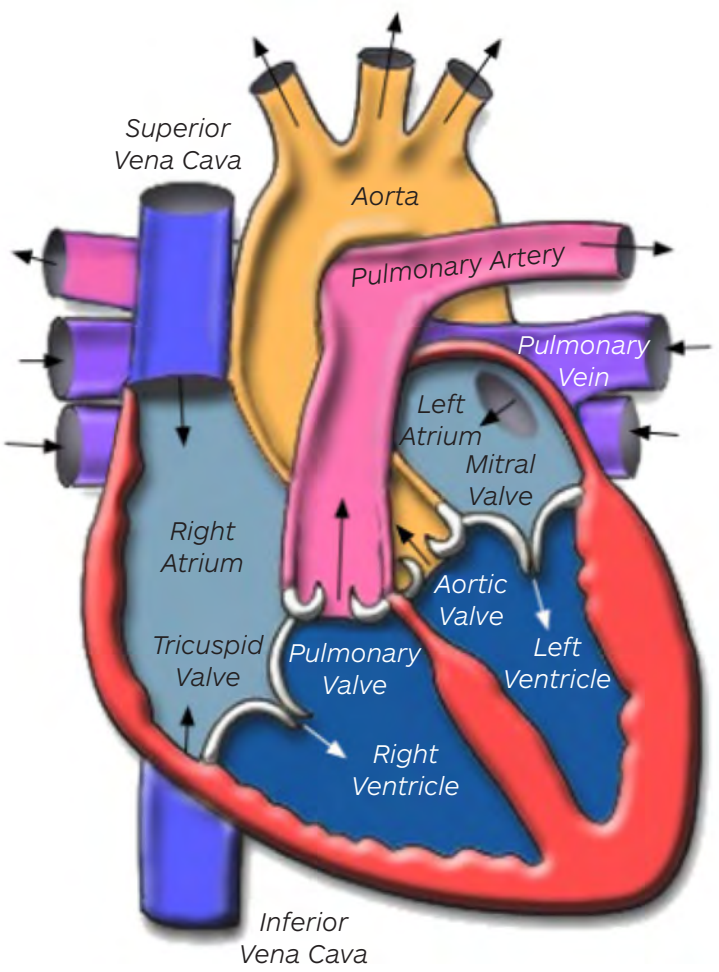
Four valves in the heart act as one-way doors to direct blood flow. A wall (septum) divides the heart into a right and left side. Each side of the heart has a different job in the heart's pumping action.

The right and left sides of the heart work together. The left ventricle generates the pressure needed to move blood throughout the body.

Blood returning from the body enters the right atrium then passes into the right ventricle which pumps the blood into the lungs to receive oxygen. From the lungs the blood enters the left atrium, then flows into the left ventricle. From the left ventricle the blood is pumped out the aorta (main blood vessel) to the rest of the body. This cycle is repeated about 70 times a minute and is counted as a pulse.

As blood leaves each chamber of the heart, it passes through a valve. There are four heart valves within the heart: the tricuspid valve, the pulmonic (or pulmonary) valve, the mitral valve and the aortic valve.

The tricuspid and mitral valves lie between the atria and ventricles. The aortic and pulmonic valves lie between the ventricles and the major blood vessels leaving the heart. The heart valves work the same way as the one-way valves in the plumbing of your home, preventing blood from flowing the wrong direction.

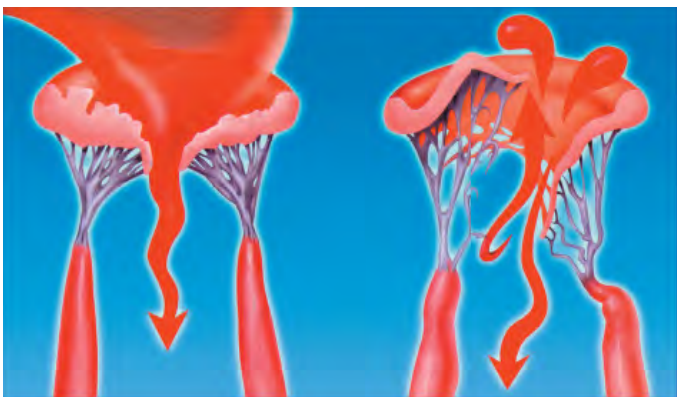


Heart Valve Problems

Valve disease occurs when a valve doesn't open or close the way it should. If a valve doesn't open all the way, the problem is called stenosis. Scarring or deposits of calcium may make the valve stiff and hard to open. Blood has to flow through a smaller opening and the heart has to work harder to push the blood through.

When the valve doesn't close tightly the problem is called insufficiency (or regurgitation). The valve may be too loose or shortened. A valve that doesn't close tightly lets blood leak backward through the valve.

Valve disease can have several causes. You may have been born with a valve problem. Rheumatic fever or a bacterial infection can damage heart valves. Coronary artery disease can cause heart valve problems. Sometimes, as you grow older, the heart valves simply wear out.



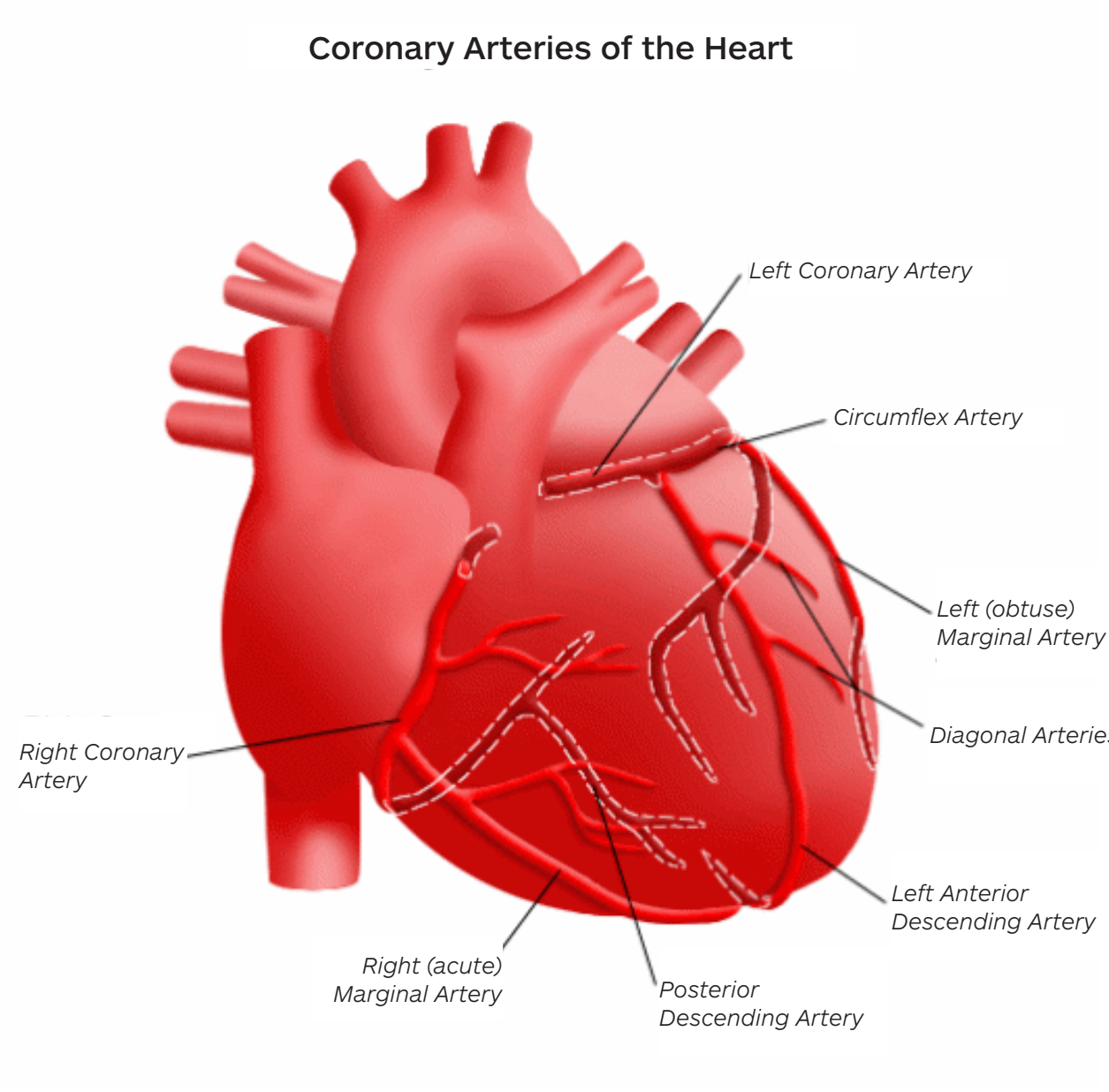
Stenosis
(problems opening)

Insufficiency
(problems closing)

What Are The Coronary Arteries?

Like all organs, your heart is made of tissue and requires a supply of oxygen and nutrients. Although its chambers are full of blood, the heart receives no nourishment from this blood. The heart receives its own supply of blood from a network of arteries called the coronary arteries. These arteries start from the aorta. The three major branches of these arteries circle the heart and take blood into the heart muscle. The coronary arteries are the lifelines to your heart.

The right coronary artery brings blood to the right side and back side of the heart. The left coronary artery has two branches: the circumflex and left anterior descending arteries. These carry blood to the septum, the front and the left side of the heart. Your heart depends on coronary arteries to deliver life-sustaining blood.



What Is Coronary Artery Disease?

Over twelve million Americans have coronary artery disease, also known as atherosclerosis, hardening of the arteries, heart disease or coronary heart disease.

Coronary artery disease has become largely preventable, almost always treatable and frequently reversible. Although there is no cure, you can live a longer, healthier life by changing your lifestyle and receiving proper medical or surgical treatments. Learning about coronary artery disease can help you actively maintain your health.

A Healthy Artery

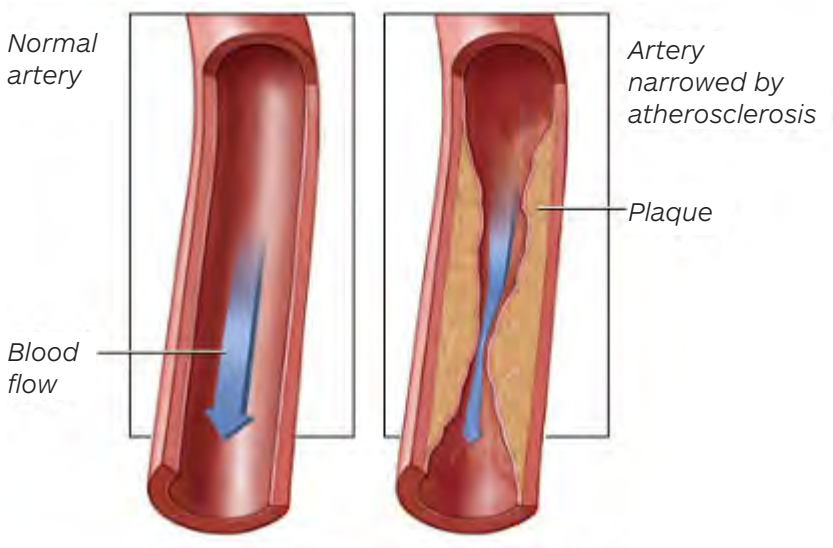
Your arteries are shaped like hollow tubes through which blood can flow freely. When the inner lining of an artery is healthy, blood flows through the artery easily. This gives your heart muscle the oxygen and other nutrients it needs. Even during activity, healthy arteries can meet your heart's increased need for oxygen.

A Damaged Artery

The inner lining of the artery can be damaged by high blood cholesterol, high blood pressure or smoking. This leads to a build up of plaque (fatty substances and calcium) within the lining of the artery. Blood may no longer flow easily to the heart muscle.

A Narrowed Artery

If plaque buildup increases, the artery narrows and blood flow to the heart muscle is severely reduced. Your heart becomes starved for oxygen, which may cause chest pain (angina).



Chest Pain (Angina or Angina Pectoris)

Angina is a temporary pain that serves as a warning that the heart is not getting enough oxygen. Angina is most common when the heart is working harder than usual. However, you can also have angina when resting.

Symptoms vary from person to person, but they are usually consistent for each individual. When angina occurs, physical demands on the heart must be reduced. The best way to do this is to stop what you are doing and rest which reduces oxygen demand. Taking nitroglycerin helps by dilating (expanding) the coronary arteries to improve the oxygen supply to the heart.

If symptoms become more frequent, severe or don't go away with nitroglycerin and rest, call your doctor or **dial 9-1-1**. Minutes matter. If symptoms persist, do not wait to call 911.

Angina symptoms include:

- Pressure
- Tightness
- Squeezing
- Aching
- Burning
- Cramping

Located in the chest, arm, neck or jaw

- Shortness of breath
- Nausea/GI upset
- Women are more likely to experience symptoms like shortness of breath, nausea, vomiting, back pain or jaw pain.

Heart Attack (Myocardial Infarction)

A heart attack occurs when the blood supply to the heart muscle is blocked for an extended period of time (often due to a clot forming in a partially blocked coronary artery). This can result in permanent damage to the heart muscle. Symptoms usually last longer than 30 minutes and are not relieved by rest or medication.

If you suspect you are having a heart attack: **Call 911 for emergency help**. Quick treatment of a heart attack is very important in order to help lessen the amount of damage to your heart muscle and to prevent sudden cardiac death.

Why Do You Get Coronary Artery Disease?

No one knows the exact reason some people get coronary artery disease. However, certain risk factors are known to increase your chances of having coronary artery blockage. Although heart surgery can be life-saving, the benefits are temporary unless the underlying disease process in the coronary arteries is addressed. Reducing your risk factors can slow or stop the progression of coronary artery disease.

Risk factors are divided into two categories—those that you cannot change (non-modifiable risk factors) and those you can change (modifiable risk factors).

The more risk factors you have and the longer they have been present, the greater your odds of developing heart disease. If you have heart disease, reducing your risk may slow or stop the progression of blockages.

Non-modifiable risk factors

- Family history of early heart disease (Father or brother before age 55, mother or sister before age 65)
- Being male over age 45
- Female who has experienced menopause
- Being female over age 65

Modifiable Risk Factors

- Smoking
- High blood cholesterol (over 200) or high LDL cholesterol (over 100)
- Low HDL cholesterol (below 40)
- High blood pressure (over 130/80 mmHg at rest)
- Depression, anger, stress or hostility
- Diabetes
- Inactivity (lack of exercise)
- Being overweight (obesity)



Your Treatment Plan For Heart Disease

Although there is no cure for coronary artery disease, by learning more about your disease, making lifestyle changes and following your treatment plan, you can live a longer, fuller life. Remember, you play the major role in the management of your heart disease. Your treatment plan includes:

1. Reducing your risk factors
2. Taking your medications as directed
3. Having surgery or other procedures, if necessary
4. Seeing your heart doctor (cardiologist) for regular visits

It is up to you to make healthy choices, eliminate risk factors and follow your treatment plan. Surgery can bypass severely blocked arteries but it does not stop the potential build up of plaque in other arteries. You can do this by taking your medications and reducing your modifiable risk factors.

Control High Blood Pressure

High blood pressure (hypertension) puts strain on your heart by increasing its workload. High blood pressure can damage the lining of your coronary arteries, damage heart valves and stiffen the heart muscle. High blood pressure may be present if resting readings are routinely greater than 130/80 mmHg.

BP Classification*	Systolic Blood Pressure (mmHg)	Diastolic Blood Pressure (mmHg)
Normal	Less than 120	Less than 80
Elevated	120 - 129	Less than 80
Hypertension	Routinely >130	Routinely >80

** Discuss your blood pressure goals with your doctor, especially if you are +60 years or older, or have diabetes or chronic kidney disease.*

Tips to control your blood pressure include:

- Eating a diet low in sodium (salt)
- Maintaining your ideal weight
- Following a regular exercise program
- Taking your medications as directed
- Checking your blood pressure routinely

Stop Smoking

Cigarette smoking robs your heart of oxygen. It can also damage your blood vessels, temporarily raise your blood pressure and speed up your heart rate. If you smoke, you must quit. Some people may be able to quit by themselves, others need a program or medication to help them quit.

Ask your doctor or nurse for information regarding smoking cessation programs and medications available to help you. Also check the "*Resources*" section of this binder.



Control Stress, Anger and Depression

Uncontrolled stress, anger and depression are linked to increased risk of heart disease. Too much stress may strain your heart by making it pump harder and faster. This can also increase your blood pressure. If you feel that your stress level is out of control, it is time to make changes in the way you manage your time and relieve your stress. Professionals can help you make these important changes, talk to your doctor.

Lower High Cholesterol

TEST	GOAL: If you have heart disease, diabetes or 2 or more risk factors	GOAL: If you are low risk (no risk factors and no heart disease or diabetes)
Total Cholesterol	Less than 180	Less than 200
Triglycerides	Less than 150	Less than 150
HDL	Higher than 40	Higher than 40
LDL	Less than 100 Less than 70 for very high risk*	Less than 130 Ideal: less than 100

** Less than 70 if you have heart disease and/or diabetes and 2 or more risk factors.*

Total Cholesterol

Total cholesterol is made up of the cholesterol present in several fat containing molecules, including triglycerides, LDLs and HDLs. The total cholesterol is less important than the components that make up the total cholesterol. Your total cholesterol is affected by a number of factors, including what you eat, your weight, physical activity, age, gender and genetics.

Triglycerides

Triglycerides are a type of blood fat. Studies have shown that as the level of triglycerides rise, so does the risk of heart disease. Triglyceride levels can be lowered by exercising routinely, and decreasing fat, sugar and alcohol in your diet. A heart healthy diet that is low in saturated fat, cholesterol and simple carbohydrates is recommended. See "*Diet*" section for more details.

HDL – H is for "Healthy"

HDL (good) cholesterol protects the arteries against the formation of fatty deposits. You want a high HDL. Heredity plays an important role in determining your HDL level. You can raise HDL slightly by losing excess weight, exercising routinely and not smoking.

LDL – L is for "Lousy"

LDL (bad) cholesterol causes fatty deposits in the arteries and increases the risk of heart disease. You want a low LDL. If you have heart disease, lowering LDL can stop further plaque from accumulating. You can lower your LDL by cutting down on foods high in saturated fat and cholesterol. By lowering your LDL, your total cholesterol will decrease as well. You may require medicine along with a low fat diet to reach your LDL goal.

A type of cholesterol medicine called "statins" can reduce the risk of heart attack and stroke by 30-40%. Statins lower total cholesterol and LDL cholesterol. In people who have coronary artery disease, statins lower the chance of having further heart problems even if LDL cholesterol is normal.

Control Diabetes

High blood sugars are linked to the progression of heart disease. If you have diabetes, it is important to control your blood sugar. For more information, talk with your doctor, nurse, dietician or diabetic educator.

The John Muir Health Outpatient Diabetes Center provides diabetes self-management education and support for people at risk for developing diabetes and for those with a diagnosis of diabetes. Their team of certified diabetes educators, dietitians and health educators can be reached at (925) 941-5076.

Tips to control diabetes include:

- Test your blood sugar regularly, and bring your log book and/or meter to your appointments
- Achieve and maintain your ideal weight
- Follow a diabetic diet
- Exercise daily, ask your provider what is right for you
- Take your medications as directed

Blood Sugar Goals for Patients with Diabetes*:

TIME	GOALS	TAKE ACTION
Fasting	80 - 130 mg/dL	<70 or >130 mg/dL
Pre-meal	80 - 130 mg/dL	<70 or >130 mg/dL
1-2 hours after meal	<180 mg/dL	>180 mg/dL

** Speak with your primary care doctor or endocrinologist about your specific blood sugar goals*

Achieve and Maintain Your Ideal Body Weight

Being overweight increases the workload on the heart. It also contributes to high blood pressure, high cholesterol levels and diabetes. If you are overweight it is important to shed those extra pounds. Take a look at your current eating habits. Decrease the fat in your diet and watch portion sizes. Choose low-calorie snacks. Remember, weight loss goals should be gradual and realistic. Even moderate weight loss can have health benefits.



Follow A Regular Exercise Program

Your heart is a muscle. Just like the muscles of your arms and legs, it needs regular exercise to make it strong and work its best. A regular exercise program helps to reduce your modifiable risk factors.

Exercise must be:

- Regular: 4 to 5 times per week
- Aerobic: Involves large muscle groups and is repetitive (such as walking or cycling)
- Safe: Before you begin an exercise program ask your doctor what type and amount of exercise is right for you

A Cardiac Conditioning program may be recommended after a heart related event such as a heart attack or heart surgery. Participation in a Cardiac Conditioning program is associated with fewer heart problems and a longer life. John Muir Health Cardiac Conditioning is a medically supervised exercise program designed specifically for heart patients. Each participant receives a personal exercise prescription, tailored to that person's ability and level of fitness. Education, nutrition counseling and stress management classes are also available. Cardiac Conditioning is a great way to get back on your feet in a safe, supportive, and fun environment. See "*Exercise*" section for more details.

Surgery

Surgery

All you need to know about your Surgery

Coronary Artery Bypass Surgery

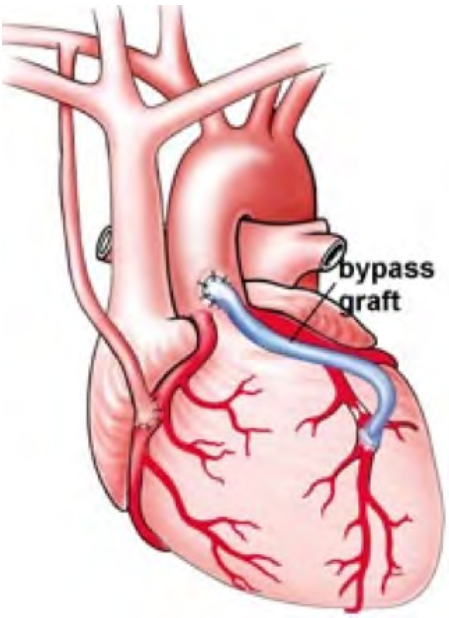
Coronary artery bypass surgery is one method used to treat coronary artery disease. Bypass surgery creates a new pathway around the blocked areas in the coronary arteries. Circulation and nourishment to the heart muscle is restored and heart function is improved. Chest pain is relieved.

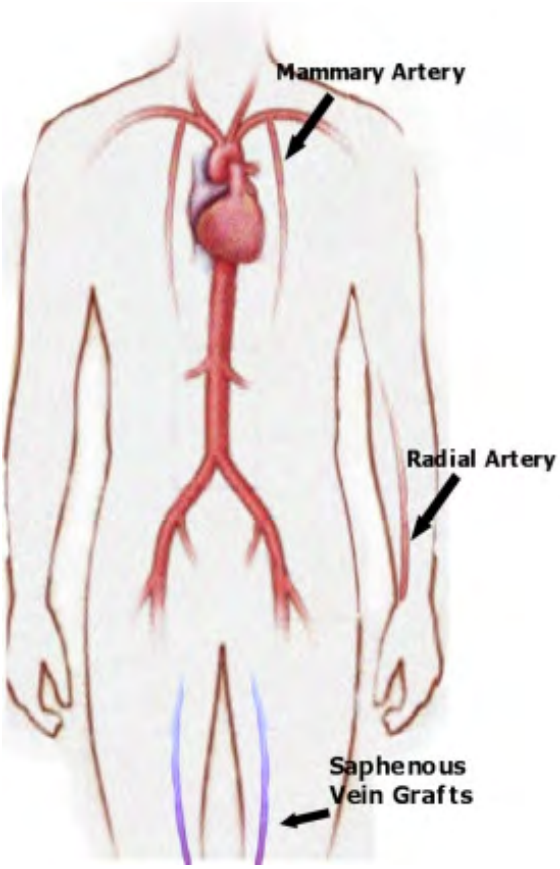
A large leg vein (saphenous vein), the radial artery from the forearm or an artery from the chest (internal mammary artery) can be used to create the new pathway. Because the mammary artery, radial artery and saphenous vessels can be spared, blood flow in your body is not usually affected by removing them. The type of vessel used depends on the number and the location of your blockages.

When a leg vein is used, one end is sewn to the aorta and the other end is sewn to the coronary artery below the blockage. Using a leg vein does not bother blood flow to that area of your leg, or your ability to walk. Other veins provide adequate venous drainage for the leg. For a short time there may be some swelling and oozing from the leg where the vein was removed.

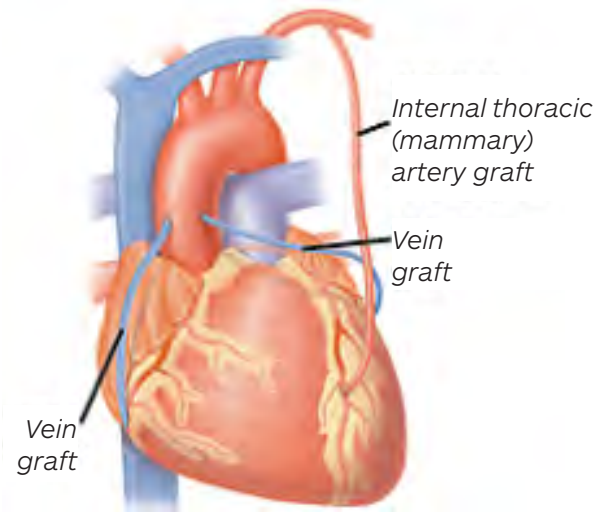
When the radial artery is used, it is removed from the forearm. This artery is located from the inner elbow to the wrist at the base of the thumb. Your arm will continue to receive blood supply from the artery on the other side of your forearm. The vein in your leg or artery in your arm can be removed in different ways, often by small incisions.

The surgeon may elect to use the internal mammary artery from your chest to bypass the obstructed coronary artery. One end of the artery is left attached to a branch of the aorta. The other end is sewn to the coronary artery below the blockage.

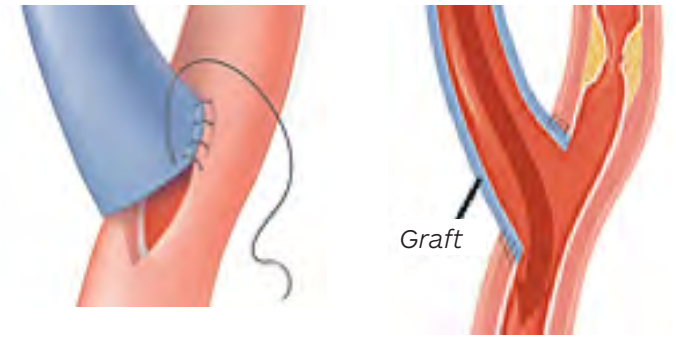




Oxygen-rich blood flows through the graft to the heart muscle. The left internal mammary artery is particularly suitable for grafting the left anterior descending coronary artery because of its size and location.



Once the bypass graft has been attached, blood can flow around the blockage.



Heart Valve Surgery

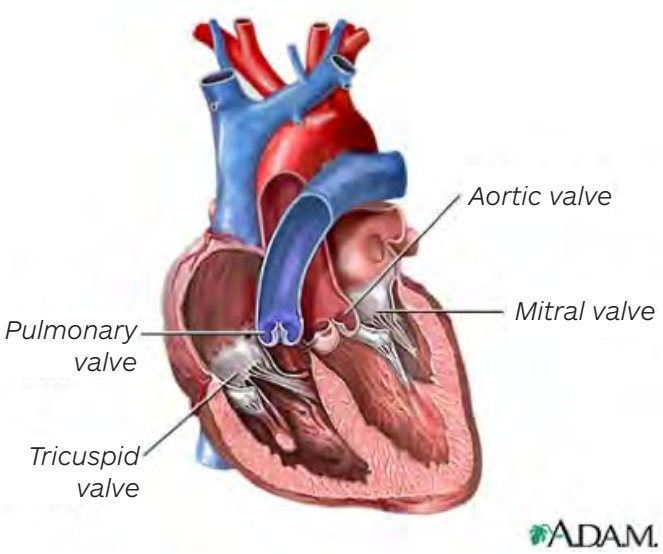
During heart valve surgery, one or more heart valves can be repaired or replaced.

Repairing a Valve

During valve surgery, the surgeon reshapes or removes parts of the valve to make the valve function more efficiently. Certain valve problems can be repaired. For insufficiency (leaky valve), extra tissue is removed or parts of the valve are strengthened to help it close more tightly. This may be done by sewing a ring around the opening of the valve.

Replacing a Valve

If a valve cannot be repaired, it may be replaced. There are two types of replacement valves, mechanical and biological.



- **Mechanical** valves are made from man-made materials and should never need replacing. Lifetime therapy with an anticoagulant (sometimes called a blood thinner) is needed when this type of valve is used. An anticoagulant prevents blood clots from forming on or around the mechanical valve.
- **Biological** (or tissue) valves are taken from pig, cow or human donors. These valves don't last as long as mechanical valves. Long term anticoagulant therapy may not be needed.

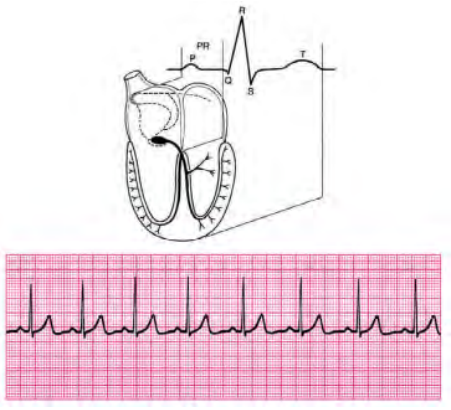
Your surgeon will discuss what type of valve problem you have and what type of valve is best for you. Factors include age, size of the valve, number of valves and your ability to take an anticoagulant.

Atrial Fibrillation Surgery / Maze Procedure

The Maze procedure is a surgical treatment that can cure atrial fibrillation. The Maze procedure is sometimes done during bypass or valve surgery if atrial fibrillation has been present.

Atrial fibrillation is an abnormal electrical conduction causing irregular heartbeats. A variety of conditions can lead to atrial fibrillation, including abnormal heart valves. Atrial fibrillation leads to an abnormal flow of blood through the heart causing a risk of clot formation and stroke. Blood-thinning medication is often required to prevent clots.

The Maze procedure creates barriers to the abnormal electrical pathways by forming scar tissue in the atria. This is effective in restoring a regular heart beat and for many people eliminating the need for blood-thinning medication.



Normal Rhythm



Atrial Fibrillation

Heart Surgery

Different Approaches for Different Treatments

Traditional Heart Surgery

To get to your heart, the surgeon makes an incision down the middle of your chest and separates the breastbone (sternum). Your heart will be stopped temporarily and your blood will pass through a heart-lung machine (cardiopulmonary bypass machine). This machine supplies your blood with oxygen and pumps it through your body.

The surgeon performs the operation on the stopped heart. A stopped heart allows the surgeon to perform the extremely precise maneuvers that are necessary to open the heart to repair or replace valves. After surgery, your breastbone is secured with wires.



Cardiovascular & Thoracic Surgeons

Off Pump Coronary Artery Bypass

Often called beating heart surgery, Off Pump bypass is done without a heart-lung machine. The surgeon uses a stabilizing device to restrict the movements of small segments of the heart and is able to operate while the heart continues to beat. Not everyone is a candidate for Off Pump bypass surgery. The person's anatomy and grafts needed are key to this decision.

Minimally Invasive Thoracotomy

This surgery is performed though a small incision between your ribs on the right side of your chest. You will be connected to the heart-lung machine by the blood vessels in your groin. Avoiding separating the breastbone (sternum) reduces recovery time in most patients. Minimally invasive surgery also leaves less noticeable scars than traditional surgery. Your surgeon will discuss if this approach is right for you.



Physician Assistants

What To Expect After Surgery

Immediately After Surgery

You will be brought directly from the operating room to the Cardiovascular Intensive Care Unit (CVICU). You will be under the effects of anesthesia. A breathing tube will be in your airway and a machine will mechanically assist your breathing for a short period of time. You cannot talk with the breathing tube in place. When you are able to breath on your own, the breathing tube will be removed.

A chest tube will be placed during surgery to remove fluid from your chest cavity. The heart monitor will continuously record your heartbeat. A temporary external pacemaker will regulate your heartbeat when needed. A tube in your bladder called a catheter will measure and record your urine output. Your blood sugar will be monitored. Family will be allowed to visit you. Visitors are allowed two at a time in the CVICU.

After Surgery

You will remain in bed initially. The nurses will help you turn from side to side to help prevent stiffness. Once the breathing tube is out you will sit on the side of the bed and then be assisted to sit in a chair. Do not get out of bed on your own.

You will start using the deep breathing exerciser (incentive spirometer) 5 times each hour. You will receive supplemental oxygen. You will get pain medication as needed to relieve pain. Use your heart pillow when coughing and deep breathing.



You should be using your deep breathing exerciser at least five times each hour. Inhale slowly and evenly, paying attention to the yellow indicator on the left side of the device.

First Day After Surgery

The day after surgery blood tests and a chest X-ray will be done. You will be given sugar-free clear liquids for 24 hours and it is very common to have a decreased appetite. You will sit in the chair for meals.

Physical therapy will begin soon after surgery. Early activity increases your strength, and helps prevent pneumonia and constipation. Physical therapy and nursing staff will work with you each day. You will be shown warm up and cool down exercises. They will then assist you with walking. You will start with short distances, progressing a little further each time.

It is normal to be tired, sore and uncomfortable. The pain medication makes it easier to get out of bed, sit up in the chair, walk and take deep breaths. Let your nurse know if you are in pain.

You may be transferred out of the cardiovascular intensive care unit on the first or second day to the Progressive Care Unit (PCU).

Day 2-3 After Surgery



You will sit in a chair for meals or at least three times each day. You will be asked to walk in the hallway four times each day with help if needed. Use your call light to let staff know if you would like to get out of bed - do not get up by yourself.

All drainage tubes (e.g., chest or urine) will be removed as soon as appropriate. Chest and leg bandages will be removed. Plans to leave the hospital will be started and you will meet with the case manager.

Day 4 After Surgery

It is important that you continue to sit in a chair with assistance as needed and walk in the hallway 4 times a day. Temporary pacemaker wires will be removed before your discharge.

Instructions for follow up care will be discussed. A cardiac nurse navigator will visit you to review post-op education. You will receive written instructions about your care when you are discharged. Before you leave the hospital, your doctor, nurse and case manager will talk with you about your medications, diet, follow up appointments, your rehabilitation program and activities for a safe recovery at home. Make sure you ask questions.



Cardiac Nurse Navigators

The cardiac nurse navigators are a resource to you for education and support during your recovery. Please call them with any non-urgent questions or concerns. They are available Monday-Friday from 8:00 am - 4:30 pm at (925) 674-2569.

Diet

Diet

All you need to know about your Diet



The old saying “you are what you eat” may be more true than we realized, especially when it comes to heart disease. High blood pressure, high cholesterol, diabetes and obesity can all be influenced by diet. Making a few small changes in your eating habits can greatly improve your health.

Here are some basic guidelines to help you get started:

- Eat a variety of foods
- Read food labels
- Choose foods low in saturated fat, trans fat and cholesterol
- Reduce sodium in your diet
- Cut back on simple carbohydrates and refined sugar
- Eat whole grains, fruit and/or vegetables at every meal

How To Fill Your Plate

Protein

1 serving =

- 3 oz. of poultry, fish or meat
- 1/2 cup legumes
- 1/4 cup nuts
- 4 oz. tofu

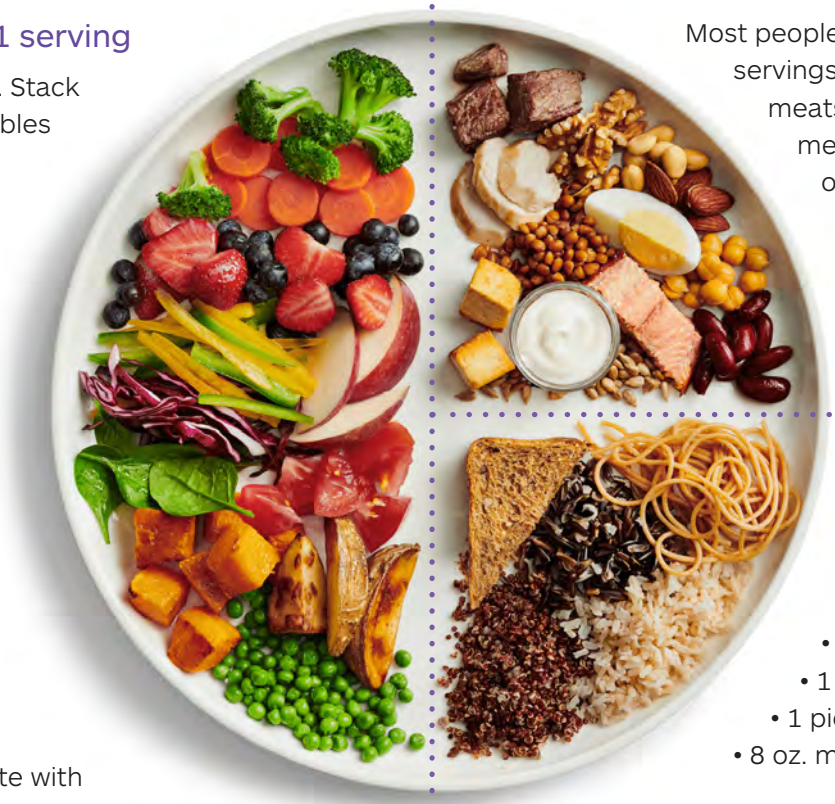
Most people only need 2-3 protein servings per day. Choose low fat meats. Don't be afraid to go meatless. One cup of beans or a veggie burger will still supply the protein you need. (Watch the sodium content of soy products.)

Veggies

1 cup of greens = 1 serving

Use dark, leafy greens. Stack them high with vegetables you like. Add carrots, tomatoes, celery, peppers, cucumbers, onions, mushrooms, etc.

Make your own dressing with a little oil and red wine or balsamic vinegar.



1/2 cup of cooked vegetables

= 1 serving

Fill the rest of your plate with 2-3 servings of broccoli, cauliflower, green beans, asparagus, carrots, squash or other vegetables that you enjoy eating. Leave off the butter and salt. Add seasonings and spices like garlic, vinegar, lemon juice, basil, dill, mint, chives and tarragon.

Carbohydrates

1 serving =

- 1/3 cup brown rice
- 1/2 cup pasta
- 1 slice bread
- 1 piece of fruit
- 8 oz. milk

A healthy food plan can include 2-3 carbohydrate servings at each meal and 1-2 choices at a planned snack time.

If you eat whole grain carbohydrates and protein at the same meal, your blood sugar is less likely to elevate quickly.

Fat Facts

Trans Fats (also called Hydrogenated or Partially Hydrogenated Oils)

Hydrogenation is a process of turning healthy, unsaturated fats into unhealthy saturated fats called Trans Fats. Trans Fats can raise your bad cholesterol (LDL) levels, lower your good cholesterol (HDL) levels, contribute to arterial inflammation and increase your risk for the build up of arterial plaque.

Some examples of Trans Fats are margarine (some margarines are Trans Fat free - check the food label) and shortening. Most Trans Fats, however, come from processed items such as crackers, cookies, and convenience fast foods.



Look for Trans Fats on the food label listed under "Fat." Be aware that a product listed as having 0 grams of Trans Fats can actually have up to 0.5 grams per serving. To be sure your food is Trans Fat free, check the food label and the ingredient list. If the food label says 0 grams next to Trans Fat and the words hydrogenated or partially hydrogenated are not in the ingredient list, the food is Trans Fat free.

Unsaturated Fats

These are typically liquid at room temperature (such as oils) and come mainly from plant sources. Because they are less likely to raise cholesterol levels or lead to the build up of plaque, these fats are healthier than Saturated or Trans Fats. It is best to eat them in moderation. These fats still contain a lot of calories and overeating them can lead to weight gain which can contribute to elevated cholesterol, increased LDL and high triglycerides.

Mono Unsaturated Fats

These can help reduce your levels of bad cholesterol (LDL), decrease your risk of heart attack and stroke, and help protect your cells against oxidation (they are also known as antioxidants). These fats are especially beneficial to your health when eaten *in place of* Saturated or Trans Fats.

Good foods containing Monounsaturated Fats include avocado, olive oil, sesame seeds, almonds, peanuts, peanut oil and canola oil.

Poly Unsaturated Fats

Omega 3 Fatty Acids: These types of fat are especially good (possibly the best) at helping decrease arterial inflammation, protect against oxidation, decrease bad cholesterol (LDL), possibly increase good cholesterol (HDL), decrease risk of blood clot development, decrease triglyceride levels, decrease production and adhesion of arterial plaque and possibly improve blood pressure.

Good foods containing Omega 3 Fatty Acids include walnuts and walnut oil, flaxseeds and flaxseed oil, canola oil and fish (especially *wild* Pacific Salmon or Pacific Herring).

Tell your doctor about any fish oil or flax oil capsules you take or plan on starting as they may interfere with medications.

Omega 6 Fatty Acids: These are not as good as Monounsaturated fats or Omega 3 fatty acids but may reduce your risk of coronary heart disease, especially when used *in place of* Saturated or Trans fats.

Good foods containing Omega 6 Fatty Acids are soybean oil, sunflower oil and corn oil.

Carbohydrates

As our major source of energy, carbohydrates are important to eat at each meal. Some are, however, better than others. Whole grain or high fiber carbohydrates are the best to eat because they contain their natural fiber, vitamins, minerals, proteins and healthy fats. Refined carbohydrates have had these things removed, leaving only the starch and simple sugars.

Examples of Whole Grain or High Fiber Carbohydrates: *Whole* wheat flour, whole wheat bread, whole wheat pasta, brown rice, breads and cereals with 3-5 grams of fiber per serving size, quinoa, barley, oats, lentils, peas and beans.

Examples of Refined Carbohydrates: White flour, white bread (including sourdough), white pasta, white rice, breads and cereals with 1 gram or less of fiber per serving size, white sugar, brown sugar, raw sugar, molasses, honey and foods made with these products (such as cookies, candies and soft drinks).



Fiber

Fiber helps lower your cholesterol, improve your digestive health, control your appetite and manage your weight. It is recommended you eat 25-30 grams or more of total fiber each day. Most people can easily achieve this by changing the refined grains they eat to whole grains.

Soluble Fiber: This type of fiber can lower your cholesterol levels and decrease your overall risk of cardiovascular disease. Foods high in soluble fiber include oats, peas, rice bran, barley, citrus fruits, strawberries and apples.

Insoluble Fiber: This type of fiber is also associated with decreased cardiovascular risk, as well as greater and prolonged satisfaction after eating, slowed stomach emptying after a meal, and decreased overall food intake. Foods high in insoluble fiber include whole wheat breads, wheat bran, rye brown rice, fruits and vegetables.

Limit Sweets and Desserts

It is best to avoid these foods on a regular basis, eating them only on special occasions and in small portions. Sweets and desserts usually contain large quantities of refined carbohydrates such as white flour, sugar, honey and/or high fructose corn syrup. They often also contain saturated fat (like butter) or trans fat (like shortening).

These types of food are often referred to as “empty calories” because they contain a lot of calories, fat and sugar, but little or no vitamins, minerals or fiber. Eating a lot of these foods can lead to an increase in your total cholesterol, bad cholesterol (LDL) and triglyceride levels, as well as increase your likelihood of obesity and obesity related diseases such as diabetes and cardiovascular disease.

Beware of Imposters

Many foods try to promote themselves as high fiber or whole grain when they really aren’t. For instance, many commercial oat and wheat bran products (such as muffins and breads) contain very little fiber and may actually be high in sodium, saturated fat and/or trans fat. Also “multi-grain” does not always mean the food is high in fiber. Be sure to check food labels and ingredient lists for the facts. Look for the words “whole wheat flour” as the first listed ingredient or for foods containing 3 to 5 grams of fiber per serving size in the food label.

Eat Less Salt for Better Health

Sodium (salt) helps maintain normal fluid balance in the body. However, too much sodium is dangerous and may cause your body to hold on to excess fluid, increasing your risk for high blood pressure.

The Goal for Daily Sodium Intake: 1500 to 2000 milligrams

- Table salt must be avoided to meet your goal.
- **No adding any salt of any kind** - **not** at the table and **not** while preparing food.
- Avoid all seasoning salts (or any item with the word "salt" in its name).
- Avoid sea salt, kosher salt and iodized salt.
- **1 tsp of salt (any salt) has 2,325 mg of sodium**. Almost 1,000 mg more than your daily goal.
- Don't cheat yourself! With so many flavorful herbs & spices, you don't need to use salt.



Sodium and Water (Fluid)

- Think of sodium as a "water magnet". The more salt eaten, the more fluid retained.
- Sodium is a food preservative and makes your food last longer.
- Processed food has a lot of sodium.
  Avoid these: frozen dinners, fast food, canned goods, cured foods, deli items.
- Eat as many fresh foods as possible.

Reading a Food Label

Reading the food label is a big step toward eating for a healthier heart. Comparing labels will help you make food choices that are low in sodium (salt), low in fat and cholesterol, but high in fiber. To get started, look for the "Nutrition Facts" labels on the food package.

Serving Size

Look closely at this. It is the amount of food in only 1 serving.

If you eat more than the suggested serving size, you will be eating more of everything on the label including salt, fat and calories.

Servings Per Container

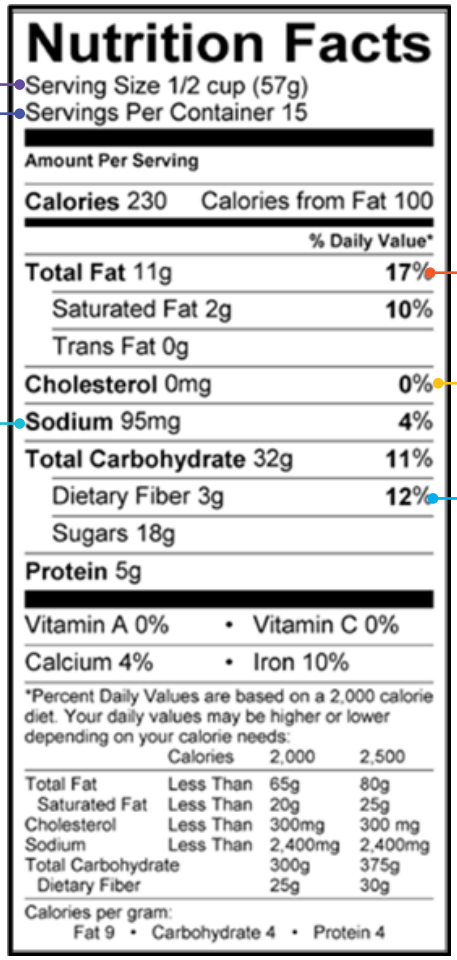
There is often more than 1 serving in each container of food, even when the container is small. The nutrition label will tell you how many "servings per container" there are.

Sodium

You want to eat 500 milligrams (mg) or less of sodium at each meal. Look for foods with less than 200 milligrams of sodium per serving size.

Example:

- A 1/2 cup portion size of this example food contains 95 mg of sodium.
- A 1 cup portion size of this example food contains 190 mg of sodium.



Nutrition Facts

Serving Size 1/2 cup (57g)
Servings Per Container 15

Amount Per Serving

Calories 230 Calories from Fat 100

	% Daily Value*
Total Fat 11g	**17%**
Saturated Fat 2g	**10%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 95mg	**4%**
Total Carbohydrate 32g	**11%**
Dietary Fiber 3g	**12%**
Sugars 18g	
Protein 5g	

Vitamin A 0% • Vitamin C 0%
Calcium 4% • Iron 10%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories	2,000	2,500
Total Fat	Less Than	65g	80g
Saturated Fat	Less Than	20g	25g
Cholesterol	Less Than	300mg	300 mg
Sodium	Less Than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

Total Fat

This number tells you how many grams (g) of fat are in 1 serving. Choose foods with a low number for total fat.

Saturated Fat

This number tells you how many grams (g) of saturated fat are in 1 serving. Look for foods that have little or no saturated fat.

Unsaturated Fat

This number tells you how many grams (g) of unsaturated fat are in 1 serving. Look for foods with higher numbers of unsaturated fat than saturated fat.

Trans Fat

This number tells you how much trans fat is in 1 serving. Choose foods that have 0 grams trans fat. Remember to check the ingredient list for hydrogenated or partially hydrogenated oils.

Cholesterol

This is found primarily in high fat animal products or foods containing high fat animal products. Look for foods with little or no cholesterol.

Fiber

Look for the highest numbers possible for this nutrient. 3 to 5 grams (g) per serving size is good, more than that is excellent.

Proteins

Protein-rich foods are important for healing your sternal wound. Eat protein at each meal.

Eat Any Day	Choose Once a Week or Less	Choose Rarely
• Peas, beans, legumes • Egg whites • Egg substitute • Fish: snapper, pacific wild salmon, perch, tilapia, trout • Nuts and Seeds • Nut butters • Skinless poultry • Low sodium soy products	• Canned peas/beans • Canned/Other high sodium legumes • Egg yolks (limit 3 per week) • Whole eggs (limit 3 per week) • Poultry with skin • Seasoned poultry • Goose and duck • Beef, Pork, Lamb, Veal • Shellfish • Canned fish (in water)	• High sodium soy or vegetarian meat substitutes • Canned meats • Fatty and cured cuts of any meat (beef brisket, organ meats, ribs, regular ground, sausage, turkey and pork bacon, lunch meats, processed meats • Large fish like shark or swordfish (high in mercury) • Any meat, poultry, fish or soy that is fried or prepared with a lot of added fat and/or salt

Grains

Eat Any Day	Choose Once a Week or Less	Choose Rarely
• 100% whole wheat bread, pasta, couscous • Low fat whole wheat or corn tortillas • Hot/cold cereal with no added sugar and at least 3-5 grams of fiber • Brown rice	• Refined (white) bread, pasta, couscous • Regular fat white, whole wheat or corn tortillas • Hot/cold cereal with less than 4 grams of sugar and 3 grams of fiber • White rice	• High fat / refined doughnuts, pastries, chips, crackers, croissants, muffins (even bran), sweet rolls • Taco shells • Hot/cold cereal with more than 4 grams of sugar and less than 1 gram of fiber

Dairy

Eat Any Day	Choose Once a Week or Less	Choose Rarely
• *Fat free* or *1% milk*; yogurt, cheese (watch sodium content), sour cream, ricotta, fortified soy milk	• *Low Fat* or *2% milk*; yogurt, cheese (watch sodium content), sour cream, ricotta	• Whole milk, cream, yogurt, cheese (watch sodium content), sour cream, ice cream, processed cheese, cheese spreads

Fruits and Vegetables

Eat Any Day	Choose Once a Week or Less	Choose Rarely
• Any fresh or frozen	• Low sodium canned vegetables • Low sodium vegetable juice • Any with added fat such as olive oil, canola oil, trans fat free margarine • Dried fruits • Canned fruit in juice • 100% fruit juice	• Canned items with more than 200 mg sodium per serving • French fries, hash browns • Vegetable juice • Any that are deep fried or prepared with added fat such as butter, cream, shortening, regular margarine or salt • Canned fruit in syrup • Fruit drinks with less than 100% juice

Fats and Oils

Eat Any Day	Choose Once a Week or Less	Choose Rarely
• Olive oil • Canola oil • Safflower oil • Nuts, trans fat free nut butters and seeds • Avocado • Fat free mayonnaise (watch sodium) • Fat free or low fat salad dressings (watch sodium)	• Reduced fat mayonnaise (watch sodium)	• Butter, margarine with trans fat • Palm oil, palm kernel oil, coconut oil • Lard, bacon fat • Whole fat or high sodium dressings and sauces • Shortening

Sweets and Snacks

Eat Any Day	Choose Once a Week or Less	Choose Rarely
• Fat free or 1% sherbet, sorbet, frozen yogurt, pudding, Italian ice, popsicles • Fat free/sodium free beverages • Fat free baked goods: cake, cookies, pretzels, popcorn (watch sodium)	• Low fat or reduced fat sherbet, sorbet, frozen yogurt, pudding, Italian ice, popsicles • Low fat microwave popcorn (watch sodium)	• High fat sherbet, sorbet, frozen yogurt, pudding, Italian ice, popsicles • Corn or potato chips • Baked goods • Buttered popcorn • Coffee beverages

Beverages

Eat Any Day	Choose Once a Week or Less	Choose Rarely
Ask Your Doctor Or Dietitian	**Ask Your Doctor Or Dietitian** • Alcohol, caffeine	• Regular soda, sports drinks, energy drinks

Heart Healthy Ingredient Substitutions

Instead of	Use
Butter or shortening	Olive oil, canola oil, trans fat free margarines
Salad Dressings	Oil & vinegar, balsamic vinegar, yogurt, citrus juices, low sodium prepared dressings
Mayonnaise	Lite or Fat free Mayonnaise, Avocado
Sour Cream	Nonfat or Low fat Plain Yogurt, Nonfat Sour Cream
Fish Canned in Oil	Low Sodium Fish Canned in Water
Ground Beef or Pork	Ground Turkey (watch fat content)
Whole Eggs	Egg Whites or Egg Substitutes
Whole Fat Dairy Products	Nonfat or 1% Dairy Products

Sample Menu - Day 1

Breakfast

- 2/3 cup bran cereal with
- 1 cup fat free milk
- 1 slice whole wheat bread with 2 tsp jelly
- 1 medium banana
- 1 cup fruit yogurt (fat free, no sugar added)

Lunch

- 3/4 cup chicken salad (recipe on next page)
- 2 slices whole wheat bread
- 1 tbsp. Dijon mustard
- Salad: 1/2 cup fresh cucumber wedges, 1/2 cup tomato wedges, 1 tbsp. olive oil and balsamic vinegar
- 1/2 cup fruit cocktail (juice packed)

Dinner

- 3-4 oz seared fish
- 1 cup green beans
- 2 small red potatoes broiled with olive oil
- 1 small whole wheat roll
- 1 tsp Trans Fat free margarine
- 1 small apple
- 1 cup fat free milk

Snack

- 1/3 cup unsalted almonds (or other nuts)
- 2 tbsp. raisins
- 1 cup orange juice

Sample Menu - Day 2

Breakfast

- 1 cup oatmeal
- 1/4 cup walnuts (or other nuts)
- 1 tsp brown sugar or sugar substitute
- 1 medium banana
- 1 cup fat free milk

Lunch

- Chicken breast sandwich: 3 oz skinless chicken breast, 2 slices whole wheat bread, 1 slice reduced fat Alpine Swiss cheese, 1 large leaf romaine lettuce, 2 slices tomato, 1/4 avocado
- 1 medium peach
- 1 cup apple juice

Dinner

- 3/4 cup vegetarian spaghetti sauce (recipe on next page)
- 1 cup whole wheat spaghetti
- 2 tbsp. Parmesan cheese
- Spinach salad: 1 cup fresh spinach leaves, 1/4 cup grated carrots, 1/4 cup sliced mushrooms, 1/2 cup corn, 1/2 cup canned pears (juice packed), 2 tbsp. vinaigrette dressing (recipe on next page)

Snack

- 2 fresh apricots
- 1 cup fat free, no sugar added, fruit yogurt

Recipes



Chicken Salad

- 3 1/4 cup cooked, skinless chicken
- 1/4 cup chopped celery
- 1 tbsp. lemon juice
- 1/2 tsp onion powder
- 3 tbsp. low fat mayonnaise

Cut chicken into cubes and refrigerate. In a large bowl, combine all ingredients with chilled chicken. Mix well.



Vinaigrette Salad Dressing

- 1 bulb garlic, separated and peeled
- 1/2 cup water
- 1 tbsp. red wine vinegar
- 1/4 tsp honey (or sugar substitute)
- 1 tbsp. olive oil
- 1/4 tsp black pepper

Place the garlic cloves into a small saucepan and pour enough water (about 1/2 cup) to cover them. Bring water to a boil, then reduce heat and simmer. Reduce the liquid to 2 tbsp. and increase the heat for 3 minutes. Pour the contents into a small sieve over a bowl. With a wooden spoon, mash the garlic through the sieve. Whisk the vinegar into the garlic mixture. Mix in the oil and seasonings.



Vegetarian Spaghetti Sauce

- 2 tbsp. olive oil
- 2 small onions, chopped
- 3 cloves garlic, chopped
- 1 1/4 cup zucchini, sliced
- 1 tbsp. dried oregano
- 1 tbsp. dried basil
- 8 oz. low sodium tomato sauce
- 6 oz. low sodium tomato paste
- 2 medium tomatoes, chopped
- 1 cup water

In a medium skillet, heat oil. Sauté onions, garlic and zucchini in oil for 5 minutes on medium heat. Add remaining ingredients and simmer covered for 45 minutes. Serve over spaghetti.

Tips For Eating Out

You don't have to give up eating out to cut down on fat, cholesterol, and salt. You just need to think about what you order. Many menus highlight low-fat and low-sodium dishes. But if you can't find what you want, ask. Explain what you need to the waiter or waitress. Ask to see printed nutrition information.

Ask for What You Want



- Ask that foods be prepared in little or no fat and with no added salt.
- Ask that sauces be left off or served on the side.
- Choose sauces made with tomato instead of with cream or cheese.
- Ask for steamed rice or a baked/boiled potato, without butter or sour cream.
- Ask that vegetables be steamed and served with no butter or sauce.
- Use lemon juice or vinegar for flavor.

Keep These Tips in Mind

- Avoid soups. Choose minestrone or vegetable soups over others and ask about sodium content.
- Order salad dressing on the side. Dip your fork in the dressing, then in the salad.
- Look for fish, chicken, turkey, or meat that is broiled, roasted, poached or steamed.
- Order 1 or 2 low-fat appetizers or a low-sodium soup and a salad instead of a main dish. Or eat only half of the main dish and take the rest home.
- If you want dessert, try fresh fruit, nonfat yogurt or sorbet. Or share a dessert.

Get Started on the Road to Success!

Motivation and the desire to change are the key ingredients to success. It is not easy to change lifelong eating habits. You must set realistic goals. Work on reaching each goal, one at a time, rather than trying to change many habits overnight.

Tips for Success

- **Work on one food group at a time.** Pick a food group. Then, make the suggested changes. When you feel you have mastered it then move on to the next.
- **Plan menus in advance.** This helps avoid "mindless" eating and makes trips to the grocery store easier and more efficient.
- **Reward yourself for each success.** When you reach a goal, pamper yourself with a special treat (other than food!).
- **Accept and learn from your mistakes.** Remember, if you ate too many calories, or too much fat or sodium, make a note of why you slipped and plan to avoid the problem in the future. Work on diet changes meal-by-meal. Each meal is a new opportunity to learn and improve.

What About Diabetes?

Everything recommended for a heart healthy diet, is also recommended for a diabetic diet. Most of your carbohydrates should be from high fiber sources. The difference is that you will need to monitor their portion sizes, even the high fiber ones. You should continue to focus on eating lean, low fat proteins and vegetables.

EAT THESE: Fish, whole fruits, whole grains, vegetables, lean meats, low fat or non fat dairy, beans.

LIMIT THESE: Fruit juice, sodas, sugar, honey, sweets, candy, pastries, high fat meats, high fat dairy.

Talk to your dietitian to determine how many carbohydrate foods you should eat each day.

Exercise

Exercise

All you need to know about Exercise & Activities

Exercise should begin and end with a few minutes of a warm up and cool down. Warming up and cooling down gets your heart and muscles ready for activity and prevents injuries to muscles and joints. Slow, gentle stretching exercises can help you warm up and cool down. Stretching should be done before and after every exercise session. In addition to stretching, you can warm up and cool down by walking slowly.

Warm Up /Cool Down Exercises

Perform the following exercises prior to your walk. Do the exercises in series. These exercises will prevent you from feeling dizzy when you change positions. To cool down at the end of your walk, either slow your walking pace and/ or perform the leg exercises again (5 repetitions).





Bend ankle up toward your body as far as possible (flex your foot).



Now point toe away from your body. Do 5 to 10 repetitions on each ankle.





With arms at sides, elbows slightly bent, raise arms up. Do not raise your arms past your ears. Slowly lower. Do 5 to 10 repetitions.





With arms relaxed at your sides, raise arms up to shoulder level. Slowly lower. Do 5 to 10 repetitions.





Straighten knee fully, then relax the leg. Do 5 to 10 repetitions on each leg.



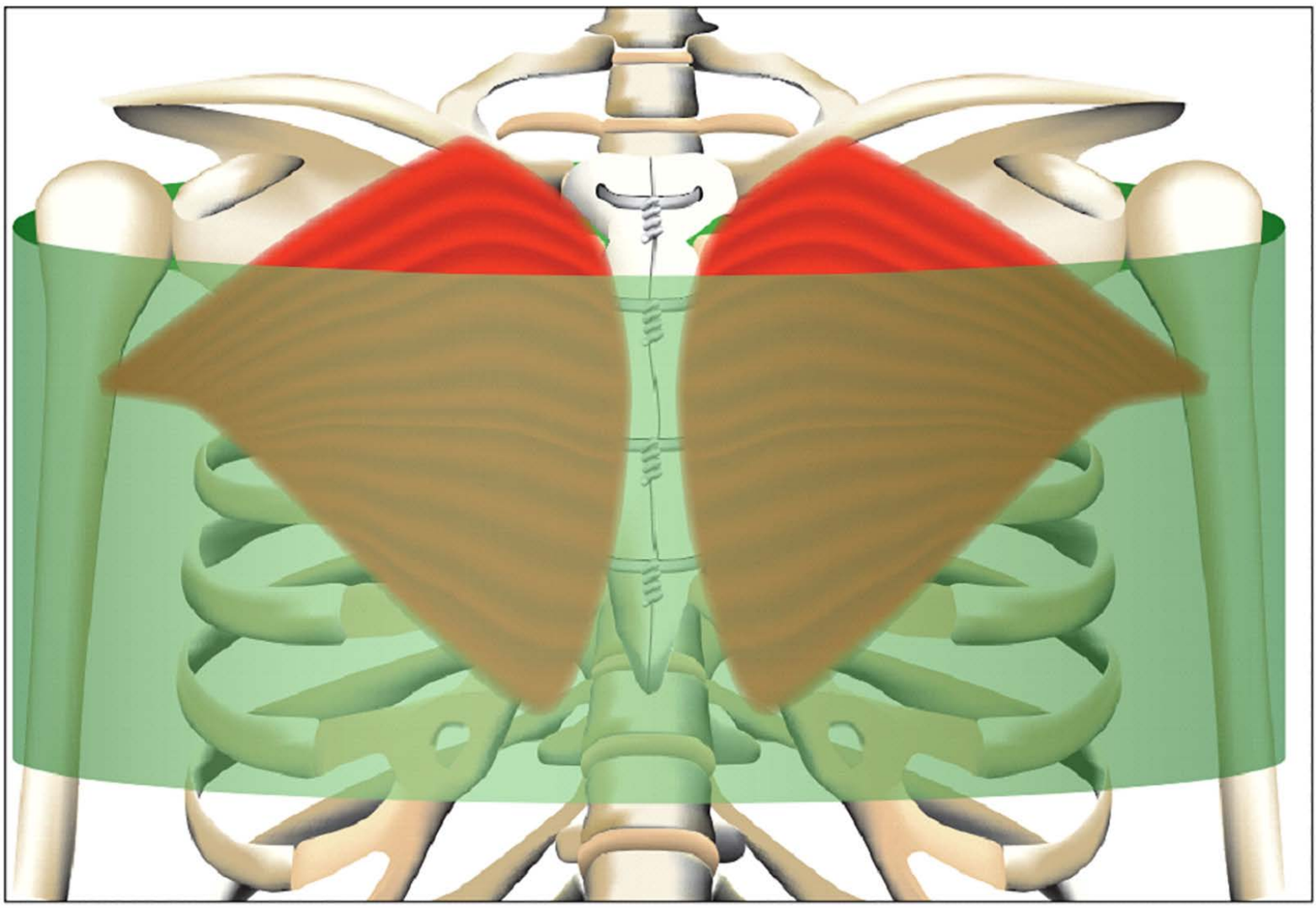


Bend left hip to lift foot off floor. Slowly lower. Repeat with right hip. Do 5 to 10 repetitions.

Keep Your Move In The Tube

If your surgery was done through your sternum (breastbone), it is important to protect your operation site as the bone heals. It can take about 6-8 weeks for the sternum to heal. Proper body mechanics can help to protect your chest.

Imagine there is a tube around your upper body. You can lift, push, and raise your arms as long as you remain "in the tube." This allows you to resume normal load-bearing activities at your own pace, within pain-free limits. By keeping your upper arms tucked in to your sides, you don't engage the pectoral muscles that connect the upper limbs to the chest wall. These muscles are shown below in red. The invisible "tube" is shown in green.



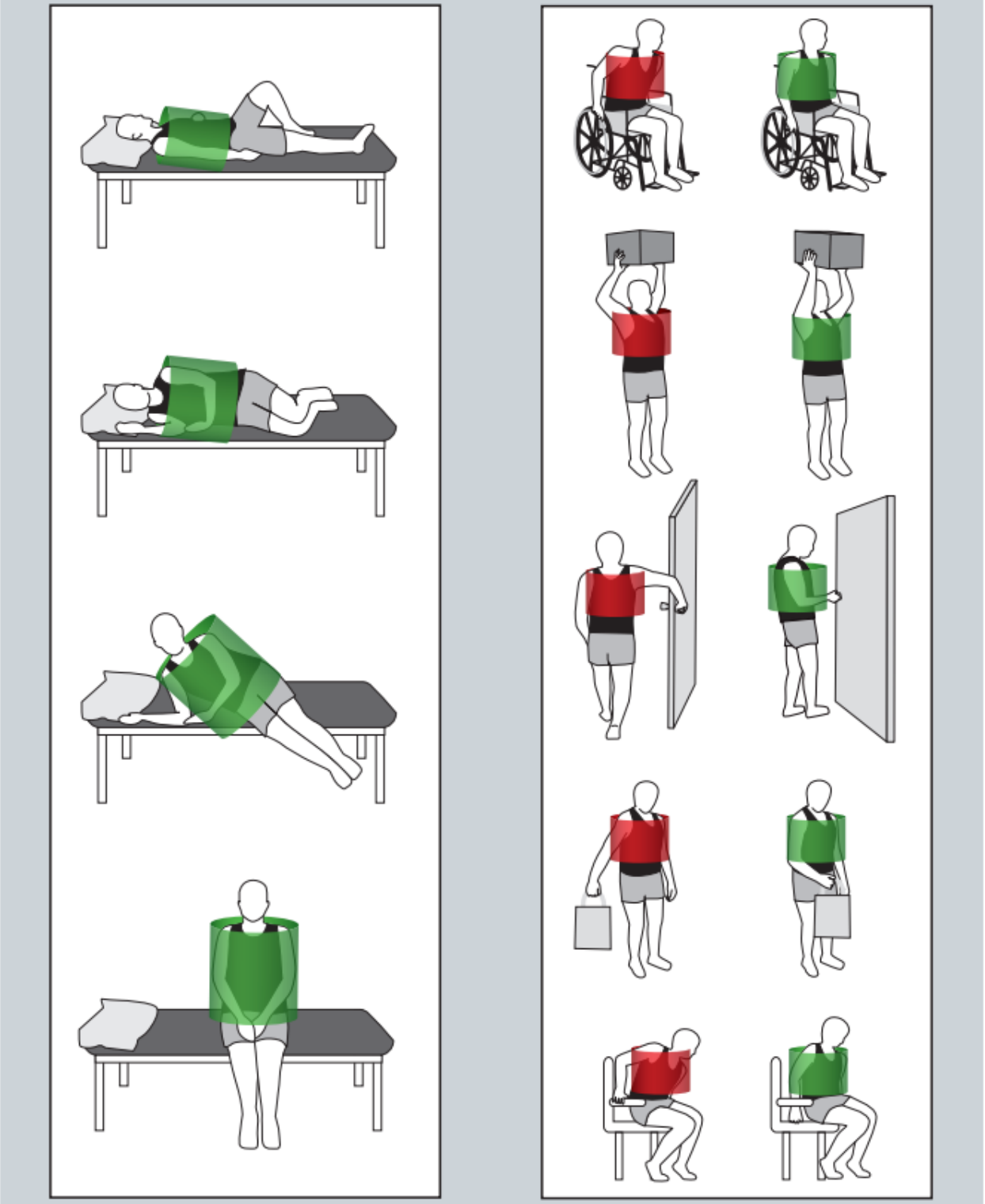
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This is referred to as keeping your **"move in the tube":**

- Keep your sternum stable and in line by keeping your upper arms close to your body, as if they are inside the imaginary tube (shown in green)
- Keep your arms near your sides when you raise yourself from sitting.
- Use your "heart" pillow held over your chest when you cough/sneeze.

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Keep Your Move in the Tube®



All pictures with permission from Baylor Health Care System

Getting Started At Home

To get stronger, your heart needs the right kind and amount of exercise. During the first few days you are home from the hospital, it is important to get some activity several times during the day. Walk for at least 5 minutes, 4 times a day. Space your walks throughout the day. Exercise at a comfortable pace. As you get stronger you can slowly increase your pace and exercise time.

Over the next couple of days, try to increase your exercise time by adding 1 minute every other day. Start slowly, progress gradually and listen to your body. **Your eventual goal will be to walk for at least 30-45 minutes, 4 to 5 times a week**.

Walking Guidelines After Hospital Discharge

Week	Times/Day	Warm Up	Walk	Cool Down
#1 and #2	4	2 min.	5 min.	2 min.
#3 and #4	3	5 min.	10 min.	5 min.
#5 and #6	2	5 min.	15 min.	5 min.
#7 and #8	2	5 min.	20 min.	5 min.
Forever	1	5 min.	30-45 min.	5 min.

Exercise improves muscle tone and strength. It also helps you feel better both physically and mentally. It takes time to get your strength back. Be patient.

Benefits of Regular Exercise:

- Helps your heart pump better
- Helps control your weight
- Helps lower your blood pressure
- May lower LDL cholesterol
- May increase HDL cholesterol
- Helps you handle stress better
- Improves your outlook on life
- Helps prevent or control diabetes



Cardiac Conditioning

Cardiac Conditioning is a medically supervised program specifically designed for patients who have had a heart attack, heart surgery or heart related procedure. It is composed of a comprehensive, multidisciplinary team whose goal is to help with the following:

- Increase your physical strength and cardiovascular fitness
- Help you perform daily living activities
- Reduce your need for future hospitalization
- Reduce your anxiety about heart disease
- Give you more self-confidence
- Reduce risk factors that affect coronary artery disease
- Access to peer support

For more information, contact the **Cardiac Conditioning Program** at:

Pleasant Hill Outpatient
3480 Buskirk Ave
Pleasant Hill, CA 94523
(925) 947-5254

Phases of Cardiac Conditioning

I

PHASE I — In Hospital

Cardiac conditioning begins while you are still in the hospital. Vital signs (blood pressure, heart rate and oxygen level) will be assessed before and after exercise. You will be evaluated by a Cardiac Nurse and Physical Therapists, and instructed in light exercises, body mechanics and post surgery precautions. Your activity will progress to stair climbing, if needed, to help you resume your usual activities.

The role of the Physical Therapist includes:

- Assessment of physical status and creating appropriate individualized exercises
- Education on the benefits of exercise in the management of cardiac disease
- Monitoring of the patient during a supervised exercise session
- Teaching warm up and cool down exercises
- Relaxation techniques and advice on how to pace activities

II

PHASE II — Outpatient

Patients with cardiovascular disease can exercise in Phase II as early as 4-6 weeks after heart surgery. This phase requires a doctor's referral and involves telemetry monitoring during exercise. Phase II is a 12 week series of 3 exercise sessions per week. Phase II Cardiac Conditioning is covered by most insurance plans.

The goals of Phase II are to:

- Return you to normal active life Improve functional capacity and endurance
- Provide education regarding medications, lifestyle changes & nutrition
- Reduce fear and anxiety about how to increase activity
- Assist in making optimal social and psychological adjustments

III

PHASE III — Outpatient

This phase is designed to develop cardiac fitness through prescribed exercise. Candidates for Phase III include individuals who have a prior history of heart disease, those who are at high risk of developing heart disease, and graduates of Phase II Cardiac Conditioning. Participants take their own pulse rate at specific intervals. Cardiac Conditioning staff check blood pressures regularly and report any clinical changes to the patient's doctor. Phase III is not covered by insurance. There is a monthly fee for participating in Phase III.

Taking Your Pulse

Taking your pulse during exercise will tell you if you are doing enough, too much or too little.

- A normal pulse is 60-100 beats per minute at rest
- During exercise your pulse should be 10-30 beats per minute higher than at rest

Count Your Pulse:

- At rest, before you start exercising, to establish a baseline heart rate
- After peak exercise, to determine your heart rate response to exercise
- After cooling down, to be sure your heart rate is returning to resting levels

Radial Pulse:

This pulse is found at the thumb side of your wrist with the palm up. It is best felt by using the pads of the two fingers on your opposite hand. Do not use your thumb, as it has its own pulse and may give you an incorrect reading. Apply light pressure to feel the pulse clearly.



Once you have located your pulse:

Count the number of beats in 15 seconds and multiply by 4. This is your pulse rate for one minute. **If you have an irregular heart beat:** Take your pulse for one minute.

Rate Of Perceived Exertion Scale

If you are unable to monitor your pulse, use the Rate of Perceived Exertion Scale.

- Stay in the green zone
- You should be able to talk while you are exercising
- No huffing and puffing. Stay with a comfortable push

Yellow zone	6	
	7	Very, very light exertion
	8	
	9	Very light exertion
	10	
Green zone	11	Moderate exertion
	12	
	13	Somewhat hard exertion
Red zone	14	
	15	Hard exertion
	16	
	17	Very hard exertion
	18	
	19	
	20	Very, very hard exertion

Stop Exercising If You:

- Have chest pain or feel dizzy or lightheaded
- Feel burning, tightness, pressure or heaviness in your chest, neck, shoulders, back or arms.
- Have unusual shortness of breath
- Have unusual increased joint or muscle pain

Medications

Medications

All you need to know about your Medications

Your doctor will prescribe medications when you are discharged from the hospital. Most medications will be sent electronically to your pharmacy, or you will receive a paper prescription. It is important to have your insurance cards with you when you pick up your prescriptions at the pharmacy. Take the medicine exactly as your doctor prescribes. Keep a current list of your medicines, dosages, and times to be taken in your wallet or purse. Do not take other medications, supplements, or herbal preparations without telling your doctor as they can interfere with your prescription medications. Additional information about your medications will be provided by your nurse or pharmacist before discharge. They will also review which of your home medications you should continue or stop taking. Ask questions of your doctor and pharmacist. Make sure you understand what the medication is for, how to take it and the side effects to watch for.



Side Effects

If you have any of the following side effects from medication, you should call your surgeon's office:

- Diarrhea, constipation, or stomach pain
- Nausea, vomiting, and upset stomach
- Dizziness or lightheadedness when standing
- Confusion
- Tingling in hands and feet
- Extremely slow or fast pulse
- Skin rash
- Unusual bruising or bleeding

Tips for managing your medications:

- Organize your pills in a divided pillbox to keep track of each dose taken. Keep remaining medication in the container it came in, tightly closed and out of the reach of children.
- Most medications are stored at room temperature away from excessive heat and moisture. Do not store them in the bathroom. Some medications may require refrigeration, consult your pharmacist regarding proper storage.
- Do not flush or throw medications away in your household garbage. Take medications to a safe disposal facility such as your local police department or pharmacy. Call your city government offices to confirm this service.
- Refill your medication when you are down to a 1-2 week supply. Ask your pharmacist to request a prescription refill from the doctor.
- Avoid hazardous activity such as driving until you know how your body will react to a new medication. Side effects not listed on your information sheet may occur.
- Take a missed dose as soon as you remember it. However, if it is almost time for the next dose, skip the missed dose and continue your regular dosing schedule. Do not take a double dose to make up for a missed one.
- Check with your doctor or pharmacist about using alcohol with any medication.
- Grapefruit can interfere with several heart medications. If you are taking a statin you should avoid grapefruit or grapefruit juice. Ask your doctor or pharmacist if grapefruit will interfere with any of the medications you are taking.

To support your treatment it is recommended that you receive the pneumococcal vaccine (pneumovax) based on your age and risk factors, as well as an annual flu shot (influenza vaccine). Ask your doctor if you have had these vaccines or if you should receive them based on your health history. Both vaccines have been shown to be very safe and effective.

Going Home

Going Home

All you need to know about Going Home

CALL YOUR SURGEON IF

- You have increased redness, swelling or drainage from your incision
- **You have a temperature greater than 101 degrees**
- You have increased leg swelling

CALL YOUR CARDIOLOGIST IF

- Your heart rate is very fast, very slow or irregular
- You have unusual shortness of breath or dizziness
- You have a weight gain of more than 3 to 5 pounds in one week
- You have chest pain that is not from your chest incision

CALL YOUR PRIMARY CARE PROVIDER for any other healthcare questions or concerns

Incision Care

- Check your incisions daily. Mild swelling and slight redness around the entire incision is normal. However, if you notice increased redness, swelling or drainage call your surgeon.
- Shower daily and wash entire incision with mild soap and warm water. Avoid vigorous scrubbing. Do not rub incisions with a washcloth. When bathing, do not reach over your shoulder to wash your back.
- Blot dry with a clean dry towel and leave it open to air. Use a fresh clean towel every day.
- Do not use lotion, powder or cream of any kind on your incisions.
- Do not take a tub bath, use a hot tub/spa, or swim.
- Stitches that are left in place are removed during your follow-up doctor's appointment. Steri-strip tapes will loosen and fall off; if they remain in place after a week, okay to gently remove.





Exercise Guidelines

If you experience shortness of breath, dizziness, leg cramping, unusual fatigue, feel irregular heartbeats and/or chest pain (angina), stop any exercise immediately. Notify your doctor if these symptoms persist.

If your post-exercise pulse rate is more than 30 beats faster than your resting pulse rate, then you have exercised too hard. In order to correct this, you will need to modify your next exercise session.

Protect Your Chest Operation Site: It takes 6-8 weeks after surgery for the sternum (breastbone) to heal. It is important to listen to your body as you recover.

Lifting: Imagine there is a tube around your upper body. You can use both arms to lift and push as long as your arms remain within the tube. When reaching for an object at your side, turn and face the object before reaching, and then use both arms to pick it up, keeping your arms tucked in so that you do not engage the muscles in your chest. As you heal, it is ok to start doing activities "outside the tube" as long as it is not painful.

Dress: Wear comfortable, loose-fitting clothes that do not put undue pressure on your incisions. If you wear a bra, choose one without underwire and with a front closure.

Walking: Walking is the most important activity you can do to speed your recovery. Walking helps prevent complications and improves your energy level. Start with 5 minutes 4 times a day. Increase walking by 5 minutes every 2 weeks until you reach 30-45 minutes per day.

Each person progresses at a different rate after heart surgery. Walk at your own pace. If you get tired, stop and rest. Do not try to do too many things at one time. When the outside temperatures are lower than 40°F or above 80°F, walk indoors.

Stairs: Unless your doctor tells you differently, you can climb stairs when necessary. Take them at a slow pace. Stop and rest if you become tired. When using the handrail, do not pull yourself up with your arms. Use your legs.

Help prevent leg swelling: If your legs are swollen, elevate them above the level of your heart for 1 hour twice a day. Elevate legs by lying down and placing both legs on 3 to 4 pillows. Do not cross your legs because it impairs circulation. If your surgery involved taking a bypass graft from your leg, check your leg daily for swelling. If you have swelling that does not improve, notify your surgeon.

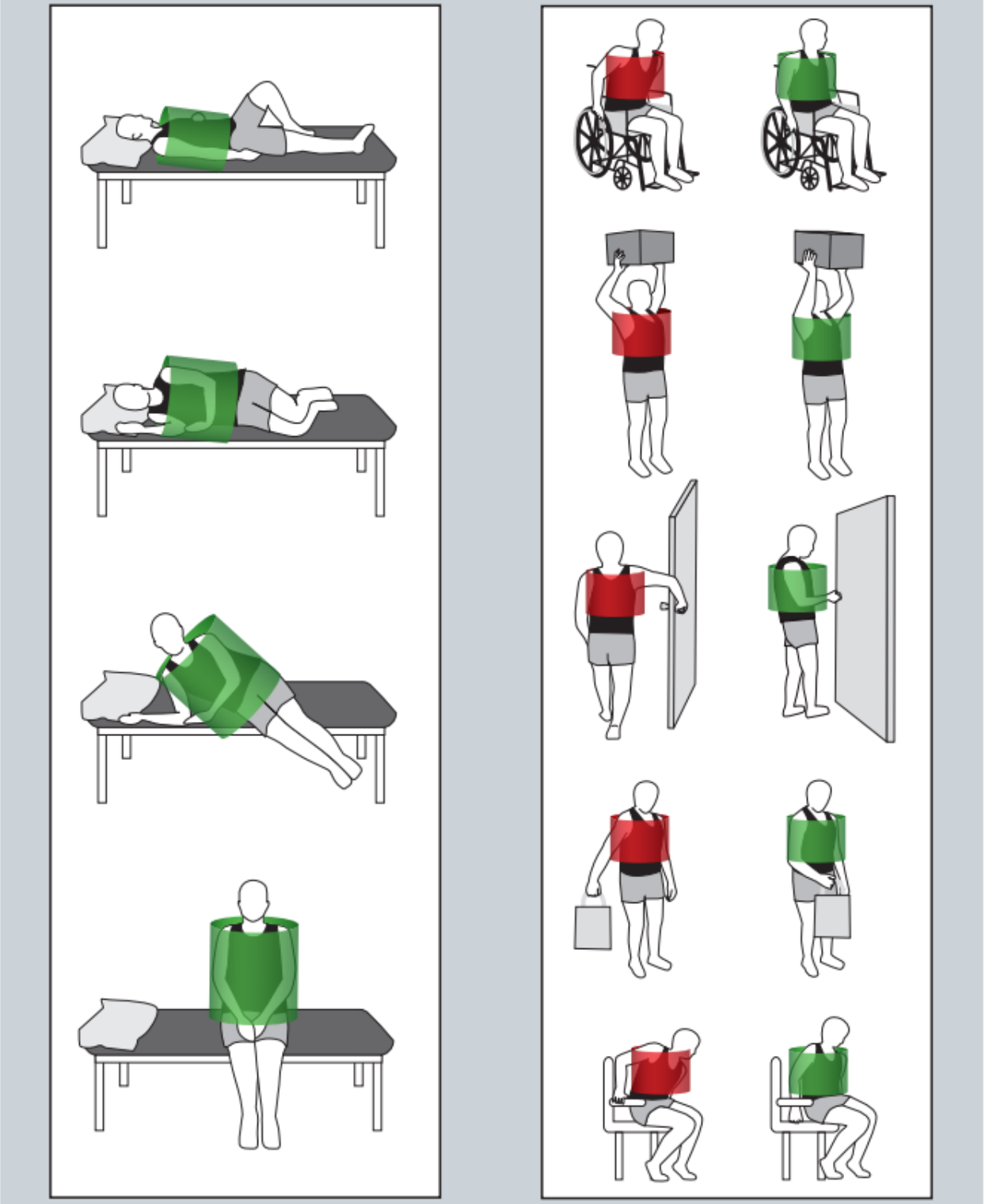
Rest: You need a balance of rest and exercise during your recovery. Plan to rest between activities and take short naps as necessary. Don't sleep all day, or you might have more trouble sleeping at night. If you normally sleep on your side, prop yourself up with pillows at about a 1/4 turn so that you are not completely on your side.

Driving: Your doctor will let you know when it is safe for you to start driving. Usually you will be allowed to resume driving about 4-6 weeks after surgery. This time period is recommended to allow your sternum to heal. You can ride as a passenger in a car at any time. It is recommended that you sit in the backseat. Always wear a seat belt. When traveling, be sure to get out of the car every 2 hours and walk around for a few minutes.

Sex: You can resume sexual relations when you feel comfortable. For many people, this is about 2-4 weeks after discharge, unless instructed differently by your doctor. Ask your nurse for more detailed information, if needed.

Work: Most patients will begin to feel like returning to light work 6-12 weeks after surgery. Check with your surgeon and get cleared before returning to work.

Keep Your Move in the Tube®



All pictures with permission from Baylor Health Care System

General Information

- Review your After Visit Summary (AVS) for important information about your medications and discharge instructions. It is important for you to follow the discharge instructions you receive.
- If you are having pain, take your pain medication regularly, as directed by your doctor. When your pain is controlled, you can breathe deeper, move easier and recover faster.
- Pain medication and inactivity may cause constipation. A laxative and/or fiber supplement might help relieve your symptoms of constipation.
- Perform warm up and cool down exercises. If you feel instability or excessive pain at your sternum, notify your surgeon immediately.
- Good body posture is important. Relax your upper body and keep your back straight.
- If you had valve repair or replacement, notify your dentist. **Antibiotics may be required before dental work**.
- No smoking. If you need assistance with stopping, contact your primary doctor.
- Limit your visitors for the first couple of weeks. If you get tired, excuse yourself and lie down. Your visitors will understand.
- Although everyone recovers at a different rate, you'll need about six to eight weeks of healing before you go back to your normal routine.

If you plan to attend **Cardiac Conditioning**, please call the center closest to your home to schedule an appointment. Cardiac Conditioning can begin 4 weeks after surgery. See "*Exercise*" section for more details.

John Muir Health Cardiac Conditioning - Pleasant Hill (925) 947-5254

Don't forget to "move in the tube" if your surgery was done through your sternum (breastbone):

- Imagine a tube slid over your upper body (illustrated on the left page in green).
- You can lift, push, and raise your arms as long as you remain in the tube.
- You can start to move outside of the tube as long as you do not experience pain. If you feel pain, stop, and resume activities within the tube.
- Use your "heart" pillow, held over your chest, to support the operation site when you cough or sneeze. The pillow helps absorb the pain at the operation site.

Daily Monitoring After Discharge

Monitor and Record Your Weight

Fluid retention and swelling can be an issue after heart surgery. To monitor your fluid balance you must:

- Weigh yourself daily, first thing in the morning after you go to the bathroom and before you eat breakfast or drink liquids.
- Wear the same amount of clothing each time you weigh.

Increased weight means you may be retaining fluid. If your weight goes up 3 pounds from one day to the next, or 5 pounds over the week, or if you have increased shortness of breath and/or swelling, call your cardiologist.

Monitor Your Temperature

Take your temperature each night for at least 2 weeks. A fever can be a sign of infection. Notify your surgeon for a temperature over 101 degrees.

Monitor your Blood Pressure and Heart Rate

It is helpful to have a blood pressure cuff at home to monitor your blood pressure and heart rate. See "*Exercise*" section for directions on how to check your pulse if you are unable to obtain a blood pressure cuff. Ask your cardiologist about upper and lower limits for your blood pressure and heart rate. If your heart rate is very fast, very slow, or irregular call your cardiologist.

Follow Up Appointments

Your follow up appointments have most likely been scheduled for you already. If they haven't, you should see your surgeon about 1 week from discharge and your cardiologist 2 weeks from discharge.



Use your Deep Breathing Exerciser every day.

- Week 1 and 2: 5 times, every 2 hours
- Week 3: 5 times, every 4 hours
- Week 4 and 5: 3 times a day

Daily Weight, Temperature & BP/HR Log*

Date	Weight	Temp (call surgeon if over 101)	Blood Pressure/ Heart Rate	Notes
Pre-op:				

** Bring this log with you to your follow up appointments*

Daily Weight, Temperature & BP/HR Log* (continued)

Date	Weight	Temp (call surgeon if over 101)	Blood Pressure/ Heart Rate	Notes

** Bring this log with you to your follow up appointments*

It is Normal to...

Not have much of an appetite.
It takes several weeks for your normal appetite to return. Many patients notice that their sense of taste initially is diminished or almost absent. Don't worry, it will return. Some patients are even nauseated by the smell of food for a week or two after surgery.

Have some swelling, especially if you have a leg incision.
Your leg may continue to swell for some time. Elevate your legs, do your exercises, and wear your compression/support hose, if prescribed. These things will help with the swelling.

Have difficulty sleeping at night.
You may find it difficult to fall asleep, or you may wake up at 2:00 a.m. or 3:00 a.m. and not be able to fall back to sleep. This will improve. If difficulty sleeping or staying asleep is due to pain or significant discomfort, taking your prescribed pain medication about an hour before bed may help. Also, exercising during the day will help you fall asleep faster and sleep more soundly.

Have problems with constipation.
You may use a stool softener or laxative of your choice. Drinking plenty of water and walking, as approved by your doctor, adding more fruits, vegetables, and fiber in your diet can help move things along.

Have mood swings and feel sad on some days.
Your body went through some major changes during surgery. Don't become discouraged. This will get better as your body continues to heal. Talk to your doctor if you experience feelings of anxiety or depression.

Have a lump at the top of your incision.
If it is tender and slightly pink or red, this is normal and should disappear with time. Contact your doctor if you notice increased swelling, redness, or pain.

Experience muscle pain or tightness in your chest, shoulders, and upper back between your shoulder blades.
This will improve with time. Your pain medicine also will help relieve this discomfort. If the pain increases, call your surgeon or 911.

Recovery: Emotional Aspects



It is not unusual to feel worried about leaving the hospital. The hospital gives you a sense of security. When you first get home your activities should be the same as they were in the hospital. Slowly do a little more each day. Use common sense. Set goals that you can reach. You don't want to over do it, but you don't want to be inactive either. Rest when you are tired. Change an activity when it makes you tired. Gradually resume a normal routine.

At times your recovery may seem to be slow. You may feel drained from limited activity, lack of good sleep, medicines and surgery itself. On some days you will have more energy than others. This is normal. It takes a lot of energy to deal with fear and anxiety, and you may show your feelings more than usual. It is common to feel depressed, anxious, tearful, tired, irritable and more sensitive than usual. These feelings may be due to the many changes in your life which you are adjusting to. The recovery process is experienced differently by each person. Some people have bad dreams. Others have a loss of memory and can't concentrate. You may feel embarrassed or worry about your feelings. Emotional ups and downs following heart surgery are experienced by most people and are considered a normal part of recovery. These emotions should go away by the end of your recovery. If they don't, call your doctor.

Prior to your surgery you were probably used to being in control of many aspects in your life. After surgery, you may be more dependent on others and perhaps be pampered more than you would like. You will not be driving or working for a while and this may lead to a change in roles within your family. It is important for you to remember that there is still a lot you can do and your limitations are short-term.

As you are recovering from surgery you will also begin to make some long-term lifestyle changes. This may include making changes in your diet, medications, exercise, stopping smoking and learning to manage stress. Remember habits which took years to develop cannot be changed overnight. Try your best, but don't be too hard on yourself.

Although recovering from heart surgery can be stressful, many people also find it to be a positive experience. It gives you the opportunity to re-evaluate your life and perhaps alter some of your priorities. Many people say that it has helped them to "stop and smell the roses." It can also help strengthen relationships and open up communication within the family. Talking to your friends and family about your feelings is the best way to cope with the difficulties you may be experiencing.

Please remember, your care team at John Muir Health is here to help you through this process. Please do not hesitate to reach out to your doctors or cardiac navigators if you have questions or need assistance.

Resources

Resources

All you need to know about your Resources

You are not alone in this. There are places, people and resources available to you whether you are near or far. Take advantage of these services to make your recovery easier.

John Muir Health Cardiovascular Services

Cardiac surgery information available at: www.johnmuirhealth.com/cardiacsurgery, or scan the QR code.

Cardiac Conditioning

Medically supervised cardiac rehabilitation programs are offered to improve cardiovascular fitness and awareness in individuals who have heart or blood vessel disease and to help those who are at high risk of developing circulatory disease. Doctor referral is required. Fee, may be covered by insurance. Offered at the following locations:

John Muir Health Cardiac Conditioning

Pleasant Hill Outpatient
3480 Buskirk Avenue Suite 110
Pleasant Hill, CA 94523
(925) 947-5254

John Muir Health Wellness Services

Walnut Creek John Muir Health
#100 - 1656 N. California Blvd

- John Muir Health Wellness Services – (925) 941-7900
- John Muir Health Community Health Improvement – (925) 941-7900
- John Muir Health Mammography and Ultrasound – (925) 947-3242
- John Muir Health Pre Op Dept – (925) 941-4058
- John Muir Health Center for Women's Continence and Pelvic Health – (925) 941-7900

Mended Hearts

Mended Hearts is a national organization affiliated with the American Heart Association that provides support and education to cardiac patients and their families. Call (925) 947-5206 for more information. Free.

Senior Services

Health resource center and library, insurance counseling and other services for seniors available at John Muir Health Senior Services. (925) 947-3300.

Smoking Cessation

Community sponsored smoking cessation programs and information:

- California Smokers Help Line – 1-800-QUIT-NOW (1-800-784-8669)
- American Cancer Society Quit for Life – 1-866-QUIT4LIFE (1-866-784-8454)
- Nicotine Anonymous 12 Step Program – 1-877-879-6422 | www.nictoine-anonymous.org
- The California Smokers' Helpline:
    - English – 1-800-NO-BUTTS (1-800-662-8887)
    - Spanish – 1-800-45-NO-FUME (1-800-456-6386)
    - Mandarin & Cantonese – 1-800-838-8917
    - Vietnamese – 1-800-778-8440
    - Korean – 1-800-556-5564
    - Chewing Tobacco – 1-800-838-8917
- Stop Smoking Website – http://www.nobutts.org

Smoking cessation resources may be available through your health plan. Contact your health plan provider for more information:

- John Muir Health Wellness Services – (925) 941-7900
- Contra Costa Health Plan participants – 1-800-495-8885
- Kaiser Permanente Healthy Living – Resource and Classes:
    - Antioch – (925) 813-3560
    - Martinez – (925) 372-1198
    - Walnut Creek – (925) 906-2190
    - Pleasanton – (925) 847-5172
    - Richmond – (510) 307-2210

Books

- A Woman's Guide to Living with Heart Disease by Carolyn Thomas. 2017 Call #616.12008 THOMAS
- American Medical Association Guide to Preventing and Treating Heart Disease by Martin Lipsky. 2008 Call #616.12 AMERICAN
- Encyclopedia of Heart Disease by M. Gabriel Khan. 2011
- The End of Heart Disease: The Eat to Live Plan to Prevent and Reverse Heart Disease by Joel Fuhrman. 2016 Call #616.12 FUHRMAN
- Heart Smart for Black Women and Latinas: a 5-Week Program for Living a Heart-Healthy Lifestyle by Jennifer H. Mieres, Terri Ann Parnell and Carol Turkington. 2008
- Mayo Clinic Healthy Heart for Life! by Martha Grogan. 2012 Call #616.1205 MAYO
- Outliving Heart Disease: The 10 New Rules For Prevention And Treatment by Richard A. Stein 2009
- Prevent And Reverse Heart Disease: The Revolutionary, Scientifically Proven, Nutrition-Based Cure by Caldwell B. Esselstyn Jr. 2007 Call #616.12305 ESSELSTYN
- Prevent, Halt and Reverse Heart Disease: 109 Things You Can Do by and Barry Franklin and Joseph Piscatella. 2011
- The Smart Woman's Guide to Heart Health: Dr. Sarah's Seven Steps to a Heart-Loving Lifestyle by Sarah Samaan. 2009
- The Woman's Heart: An Owner's Guide by John A. Elefteriades and Teresa Caulin-Glaser. 2010

Many of these resources are available at Contra Costa County libraries www.ccclib.org

Dietary Resources and Cookbooks

- American Heart Association Low-Fat, Low Cholesterol Cookbook: Delicious Recipes To Help Lower Your Cholesterol American Heart Association. 2004 Call #LT 641.56311 AMERICAN
- Cleveland Clinic Healthy Heart Lifestyle Guide and Cookbook by Bonnie Sanders Polin and Frances Towner Giedt; foreword by Steven E. Nissen. 2007 Call #641.56311 POLIN
- Diabetes Meal Planning Made Easy by Hope Warshaw. 2010. Call #616.4 WARSHAW
- Diabetes & Heart Healthy Cookbook by the American Diabetes Association, an American Heart Association. 2014
- The Everything Low-Cholesterol Cookbook: Lower Your LDL With These Delicious, Low-Fat Meals Your Whole Family Will Love! by Linda Larsen. 2008 Call #641.5638 LARSEN
- The Everything Low-Fat, High-Flavor Cookbook: Simple and Satisfying Meals You Won't Believe Are Good For You! by Linda Larsen. 2008 Call #641.5638 LARSEN
- The Everything Whole-Grain, High-Fiber Cookbook: Delicious, Heart-Healthy Snacks and Meals the Whole Family Will Love by Lynette Roher Shirk, Lynette Rohrer. 2008 Guide to Healthy Fast Food Eating by Hope Warshaw. 2009 Call #616.46206 WARSHAW

- The Road To A Healthy Heart Runs Through The Kitchen by Joseph C. Piscatella, recipes by Bernie Piscatella. 2006 Call #616.12065 PISCATELLA
- The New American Heart Association Cookbook American Heart Association. 2010 Call #641.56311 NEW
- The New American Plate Cookbook: Recipes For a Healthy Weight and a Healthy Life by the American Institute for Cancer Research University of California Press. 2005 Call #641.563 NEW
- The Prevent and Reverse Heart Disease Cookbook by Ann Crile Esselstyn. 2014 Call #641.56311 ESSELSTYN

Many of these resources are available at Contra Costa County libraries www.ccclib.org

Websites

General information on diseases/conditions, drugs and health news

- United States Department of Health: www.healthfinder.gov
- National Library of Medicine / National Institutes of Health: medlineplus.gov

General health information

- Harvard Health: www.health.harvard.edu
- Mayo Clinic: www.mayoclinic.org
- Cleveland Clinic: www.myclevelandclinic.org
- American Academy of Family Physicians: www.familydoctor.org

Information on cardiothoracic surgery

- The Society of Thoracic Surgeons: ctsurgerypatients.org

Information on drugs, medications and supplements

- American Society of Health System Pharmacists: www.safemedication.com

Information on complimentary medicine and supplements

- National Center for Complimentary and Integrative Health: http://nccih.nih.gov

Information on services, classes, doctors and health reference library

- John Muir Health: www.johnmuirhealth.com

General nutrition information

- Dietary Guidelines / Calories and Nutrients: www.nutrition.gov
- Academy of Nutrition and Dietetics: www.eatright.org

References

Adams, J., Lotshaw, A., Exum, E., Campbell, M., Spranger, C. B., Beveridge, J., Baker, S., McCray, S., Bilbrey, T., Shock, T., Lawrence, A., Hamman, B. L., & Schussler, J. M. (2016). An alternative approach to prescribing sternal precautions after median sternotomy, "Keep Your Move in the Tube". Proceedings (Baylor University. Medical Center), 29(1), 97–100. https://doi.org/10.1080/08998280.2016.11929379

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