Survivorship:
Heart Health for Cancer Survivors
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Heart Health for Cancer Survivors

Congratulations! You are one of the more than 13 million patients that are identified as cancer survivors. We believe that we can help you achieve an active and healthy lifestyle after cancer. Good heart health is an important part of your overall health.

Your health care team needs to understand certain things about your heart and how it functions. You as the patient are a part of that health care team. Having cancer alone does not put you at a higher risk for heart disease. However, cancer treatments such as chemotherapy and radiation can increase the risk for the developing heart disease.

We want you to understand your risk for developing heart disease. A treatment plan will be provided to help you achieve maximum functioning after cancer treatment. A thorough heart exam will include evaluation, diagnosis and treatment.

Evaluating your risk is the beginning of your heart health process. We want to provide you with the tools that will catch any problems before they arise. This book will provide you with health education materials that are helpful to you as a survivor in maintaining good heart health.

Understanding Your Heart

Knowing the basic parts of your heart and how it functions can help you communicate with your health care provider about your care.

The heart is a muscle whose job it is to pump blood through your body. The heart is composed of four chambers. The chambers of the heart are the:

1. Right atrium
2. Right ventricle
3. Left atrium
4. Left ventricle

Blood flow through these chambers are regulated by valves inside the heart. These one-way valves prevent the blood from flowing backwards.

5. Pulmonic Valve
6. Aortic Valve
7. Mitral Valve
8. Tricuspid

Large blood vessels connect to the heart and carry blood to the lungs (Pulmonary artery), and to the body (Aorta).
Important Structures of the Cardiovascular System

1. Arteries are large blood vessels that carry oxygen rich blood to the tissues throughout the body. These vessels are muscular and have the ability to expand and contract.

2. Carotid arteries are the large arteries in the neck that supply blood to the brain.

3. The aorta is the largest artery in the body.

4. Veins are vessels that carry blood from the tissue back to the heart for re-oxygenation.

5. Pericardium is the lining that surrounds the heart. Pericardial fluid lubricates the heart while it beats.

The electrical conduction system of the heart is a series of nerves and fibers that conduct electrical impulses throughout the heart. Heartbeat is regulated by this system.

What is Heart Disease?

Heart disease can be numerous things. For most people, it means that you have a condition where your heart is not functioning properly. Heart disease is a concern for everyone and can be prevented if treated early. Your heart is changing all of the time and can have problems like in other areas of your body.

The heart and vascular system play a vital role in maintaining a healthy lifestyle. Diseases of the heart or cardiovascular system could limit lifestyle and lifespan.

For a list of tests that can be performed to screen for heart disease, see page 16.

Hypertension, also called high blood pressure, is a condition in which blood pressure is elevated. If you have high blood pressure, your body is working too hard to push the blood through your vessels. This constant pressure can have a negative effect on your body and can lead to further heart disease.

Having high blood pressure for a long time can increase the risk of heart disease, stroke and kidney failure. It is recommended that you keep your blood pressure below 140/80.

Symptoms of hypertension include:

- headache
- dizziness
- chest pain
There are several different types of heart disease.

- **Congestive Heart Failure (CHF)** is a set of symptoms which include:
  
  - shortness of breath
  - fluid gain
  - fatigue
  - edema
  - abdominal distention

These symptoms seen in combination are a clue to the possibility of a dysfunctional heart muscle. There are several forms of heart muscle dysfunction.

- **Systolic dysfunction** is a condition where the left ventricle of the heart is weakened. The weakened left ventricle is unable to empty. Blood backs up into the lungs and tissues causing the symptoms referred to as congestive heart failure (CHF).

- **Diastolic dysfunction** is a condition that impairs relaxation of the heart. When the “stiff” ventricles are unable to fully relax, they may not fill completely. This causes blood to backup in the lungs and tissues. This causes the symptoms referred to as congestive heart failure (CHF).

- **Coronary Artery Disease (CAD)** is a condition in which plaque builds up in the arteries of the heart, which blocks flow to the heart muscle. Sudden plaque can rupture causing clot formation that blocks blood flow. Plaque formation (atherosclerosis) over time leads to progressive narrowing of the coronary arteries that can decrease or block blood flow. It does not matter if the blockage of blood flow to the heart is sudden or happens over a period of time. Any blockage of blood supply to the heart muscle can damage the heart muscle. The blockage of blood flow to the heart muscle can result in a condition known as a heart attack or myocardial infarction (MI).
The symptoms of coronary artery disease (CAD) are the same as the ones for a heart attack. These symptoms include:

- chest pain
- shortness of breath
- nausea and vomiting
- palpitations

The symptoms are often worse with exertion and relieved with rest. Fatigue may also be a symptom in some patients.

- **Embolic stroke** or **ischemic stroke** is a blockage of blood flow to the brain due to the formation of a clot in the arteries of the brain. These clots form when plaque ruptures or builds up in the brain’s blood vessels.

- **Hemorrhagic stroke** is the rupture of a blood vessel in the brain that causes blood to build up in the brain. This increases the pressure in the head and can cause brain damage.

Symptoms of a stroke are headache, numbness and tingling, weakness in extremities usually localized to one side, slurred speech, and/or facial drooping.

- **Hyperlipidemia** is the elevation of cholesterol levels. Low-density lipoprotein (LDL) is the bad cholesterol. This type of cholesterol has been shown to be a major contributor to the buildup of plaque in the circulatory system. High-density lipoprotein (HDL) is referred to as the good cholesterol and is thought to delay the formation of plaque in the arteries.

- **Pericardial effusion** is the accumulation of fluid in the pericardium. Fluid builds up in the pericardial sac impairing the heart’s ability to fill and empty. Then the patient experiences shortness of breath and a drop in blood pressure, which can lead to fainting. This is a cardiac emergency. Constrictive pericardial disease occurs when the sac around the heart gets stiff. The heart is unable to relax and filling is impaired.

- **Valvular disease** occurs when the valves of the heart which allow blood in and out are damaged and unable to function effectively. Impaired blood flow results in the backup of blood in the tissues and the lungs. This can lead to symptoms of heart failure if the damage to the valve is severe. Depending on the affected valve, a patient may experience symptoms such as palpitations, shortness of breath, weakness, fainting, and chest pain.

- **Arrhythmias** are abnormal rhythms. The severity of these abnormalities vary, some are completely benign and others have the potential to be life-threatening. Symptoms of arrhythmias include palpitation, shortness of breath, dizziness, weakness, fainting, and in some cases chest pain.

If you are feeling any of these symptoms call your doctor immediately.
• **Pulmonary Embolus (PE)** is a clot that has been lodged in the lungs. Symptoms of pulmonary embolus are fast heart rate and shortness of breath.

• **Deep Vein Thrombus (DVT)** is the formation of a clot in the large veins most often in the legs. The clot completely blocks blood flow to the affected area causing pain, swelling, warmth, and redness.

It is important to tell your doctor if you feel you have any of the symptoms discussed above.

**Risk Factors for Heart Disease**

Your risk factors for heart disease are either due to your lifestyle or inherited. This means that you may be at a higher risk for developing heart disease based on your health choices or your genes. These factors affect your heart health. They can impact the development of future heart disease.

**Risk Factors of the General Population**

• **Age** is a major risk factor because blood vessels age the same way as the body.

• **Family history** is a risk factor because you are more like to develop heart disease if your parents or siblings have heart disease.

• **Physical inactivity** has a negative effect on the cardiovascular system. The heart is a muscle and should be treated as you would treat any other muscle in the body. Regular exercise and physical activity will strengthen your heart and make it stronger.

• **Gender** is not a risk factor. Men and women have equal risk for developing heart disease.

These other lifestyle factors increase your risk for heart disease:

• excessive alcohol consumption

• obesity

• smoking

• uncontrolled stress

Along with lifestyle factors, certain diseases, such as high blood pressure, diabetes and metabolic syndrome, can place a person at a higher risk for developing heart disease. A person who has one of these conditions should be carefully monitored.
Risk Factors from Cancer Treatment

Some of the treatments used to treat cancer can have a negative effect on your heart. In particular some chemotherapy can cause cardiotoxicity (damage to the heart muscle).

Chemotherapy

Anthracyclines are a group of medicines used in chemotherapy treatments. You may know them by their distinctive red color. They are highly effective on breast cancer and lymphoma. However, these medicines can cause damage to the heart. Damage happens slowly over time. Not all patients taking these medicines will develop heart damage. It is hard to know who will be affected. Some patients will not have damage until 10-20 years following their cancer treatment. The more you take, the greater your chance for developing heart damage.

Patients should keep track of the dosage they received. You can find this information in your medical records. In general, an adult should take no more than 400 milligrams/m², and a child, no more than 250 milligrams/m².

There are many types of anthracyclines. Some of the more commonly used are doxorubicin, epirubicin, daunorubicin, idarubicin, and mitoxantrone.

Ask your doctor if your chemotherapy treatments include anthracyclines.

Radiation Therapy

Sometimes radiation therapy can cause damage to the heart. This can put patients at an increased risk for heart disease. The risk of developing heart disease depends on the amount of radiation received. This means radiation from many different sources including tests and treatment. You may need to have a doctor check for heart disease more often if you have had radiation therapy.

It is also important to know what parts of your body were radiated. You may need more screening if the heart and area around the heart were exposed to radiation. Your carotid artery in the neck, the coronary arteries around the heart and the valves of the heart are areas that are of concern. Of most concern is the left chest wall, which is directly over the heart.

Radiation may cause plaque to form in the blood vessels more quickly. People that had radiation prior to 1980 will be at higher risk for heart disease. This kind is of concern because it is thought to be more toxic. However there are still risks for anyone who received radiation, even after 1980. Your specific risk should be discussed with your doctor and survivorship care team.

Recently, radiation therapy has become more targeted. Doctors have worked to lessen the amount of the body exposed to radiation. This has helped to reduce the risk of heart disease. However, this risk is not completely gone. It is important to be aware of your total dose of radiation and the site(s) where the radiation was received. This information should be relayed to all persons involved in your care, including primary care physicians.
Adopt a healthy lifestyle and talk to your doctor about screening tests for heart disease. As a cancer survivor awareness is the best form of prevention.

**Reducing Your Risk of Heart Disease**

There are things you can do to lower your risk of developing heart disease. A healthy lifestyle is important in both heart health and prevention of cancer. Diet and exercise are important factors to decrease your risk. Stress management is also an important factor in reducing your risk.

**Diet**

A major focus of heart health diets is cholesterol control. **Cholesterol** is a fatty, waxy substance found in animal products. Cholesterol doesn’t just come from food sources. Your liver also produces it. The liver combined with the food you eat typically makes about 1,000 milligrams of cholesterol every day. Sometimes adding these together produces a high amount. This can lead to a problem called **hyperlipidemia**. This means you have too much cholesterol. The recommendation is to eat less than 300 milligrams of cholesterol. Choosing foods without high levels can help this. Your body will make the rest of it that you need.

There are two kinds of cholesterol. An easy way to think about it is that LDL is bad cholesterol. High fat diets raise the LDL. HDL is good cholesterol. Exercise increases HDL. For patients with hyperlipidemia the goal is to lower LDL and increase HDL. The best option is to control it through diet and exercise. Your doctor may prescribe medications if diet and exercise alone are not enough. However, this is not a substitute for a healthy diet and exercise.

**Limiting High Fat Foods**

Try to limit your fat intake to no more than 25-30% of your total daily calories, or 50-75 grams per day.

There are three major types of fat in foods.

- **Saturated Fats** – also known as animal fats (examples: red meat, poultry skin, full fat dairy products, eggs, bacon and butter) and should only be about 7% of your diet.

- **Polyunsaturated/ Monounsaturated Fats** – have a more positive effect on your heart. Most of your fat intake should come from these fats. Examples include nuts, seeds, avocados and fish high in omega-3 – like salmon and cod.

- **Trans fats** – are the worst fats. They can raise your bad cholesterol and lower your good cholesterol. Try to avoid or limit these fats. You can find trans fats in processed foods like doughnuts, stick margarine, cookies and fast foods. Less than 1% of your fat intake should come from these fats.
Decrease Your Sodium Intake

The cardiovascular system is affected by the amount of salt you eat. Salt can cause the body to hold on to water. This makes your heart and blood vessels work harder than normal. In some people, this extra work can affect their blood pressure. Having a normal blood pressure is important in maintaining a healthy heart. Low salt diets can help to control blood pressure. Normal salt intake for a person who does not have heart disease should be less than 2400 milligrams per day. If you have heart disease, talk to your doctor or dietitian about what changes you should make to your diet.

Increase the Amount of Fiber In Your Diet

Fruits, vegetables, whole grains and beans are all a great way to add more fiber to your diet. Fiber acts as nature’s broom and helps sweep the bad cholesterol out of your body. A good goal is to aim for 4 ½ cups of fruits and vegetables and at least three servings of whole grains every day.

Exercise

Exercise is one of the best tools to maintaining good heart health. You should strive to get some type of physical activity at least five times each week. The key to getting more exercise in your routine is to start slow. This may mean you only walk for 5-10 minutes daily. Slowly build up your time each week to where you feel comfortable exercising for 30 minutes at time. It is recommended that you get at least 150 minutes of moderate activity per week. Moderate physical activity can be:

- Walking
- Swimming
- Dancing
- Cycling
- Tennis
- Light jogging (to where your heart is beating quickly)

If you are unable to exercise, speak to your health care provider about other types of physical activity that you can do.

Moderate and vigorous describe how hard it is for you to do the activity. During moderate activity you should be a little out of breath and feel your heart beating a little faster. During vigorous activity, you should be breathing more rapidly and only able to speak a few words at a time.
Based on your ability and goals, try to get either:

- 150 minutes of moderate activity each week,
- 75 minutes of vigorous physical activity, or
- A combination of both vigorous and moderate activity.

Start slow with shorter sessions (10-15 minutes) at a relaxed pace to avoid injury. Then over time, increase the frequency, length and intensity of your activity. You can reach the total minutes through different types of exercise. For example, you could walk briskly for 30 minutes, five days a week. (This would be 150 minutes of moderate activity.) You could also swim laps or play basketball for 25 minutes, three days a week. (This would be 75 minutes of vigorous activity.)

The table below gives examples of moderate and vigorous activity.

<table>
<thead>
<tr>
<th>Moderate Activity</th>
<th>Vigorous Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brisk walking (17-minute mile)</td>
<td>Fast walking (12-minute mile)</td>
</tr>
<tr>
<td>Dancing</td>
<td>Running</td>
</tr>
<tr>
<td>Slow swimming</td>
<td>Fast bicycling</td>
</tr>
<tr>
<td>Golfing</td>
<td>Basketball</td>
</tr>
<tr>
<td>Gardening</td>
<td>Swimming laps</td>
</tr>
</tbody>
</table>

**Maintaining a Healthy Weight**

A combination of diet and exercise is shown to reduce the risk of some cancers. Talk to your doctor about how to keep your weight in a healthy range.

**Quitting Smoking**

Quitting smoking is probably the most important factor in preventing heart disease. Smoking can cause damage to the function of your heart and blood vessels. This increases the risk of plaque buildup. If you need help to quit, talk your doctor. You can also request a visit to the MD Anderson Tobacco Treatment Program, located in the Cancer Prevention Center.

**Cardiovascular Medications**

Medications may be used to treat a variety of heart diseases. The same drug used for high blood pressure may also be used for congestive heart failure. If you have any questions about your medications you should talk to your doctor who has prescribed the medication. For a list of some of the common heart medications please see page 14.

**Coping with Cancer and Heart Disease**

Many survivors say they have undergone a change after therapy is over. It may be hard for them to completely return to the person that they were prior to diagnosis. Many survivors have had their lives placed on hold while they
received treatment. They look forward to resuming the normal flow of the life they knew before cancer. You may still face emotional and physical issues after treatment.

Depending on the cancer and treatment that was received, the physical limits may impact how you are able to return to functioning. You may find that longstanding remission may help the amount of anxiety that you feel. Studies suggest that the rates of anxiety still persistent after treatment. If your heart was affected, you may have more stress or anxiety. This may be due to the uncertainty of having not one but two chronic diseases.

**Anxiety and Depression**

Anxiety and depression are common after treatment for cancer. There can be some factors that play a role in who is more likely to feel anxious or depressed. These are age, gender, age at diagnosis, and length of treatment. Other studies suggest that anxiety and depression are associated with increased risk of heart disease. If you think you may still experience anxiety or depression, talk your doctor for help.

**Fatigue**

Fatigue is a very common complaint among cancer survivors. Patients comment that fatigue “profoundly alters their way of life”. Sometimes fatigue can be a side effect of chemotherapy. Other times it could be a result of heart or other health issues. It is important to consider both when trying to determine the cause.

Some lifestyle changes can reduce fatigue. Smoking cessation and increasing physical activity may help lower fatigue. If you are experiencing fatigue, talk to your doctor as there may be some things you can do to reduce your fatigue.

**Issues with Sex**

Sexual problems are common among cancer survivors. If you are having issues with sex, it may be caused by heart issues. This may be more common in men. You should be evaluated by a doctor as there may be medications to help.

Cancer survivors should continue to see a primary care doctor. This doctor should perform a complete physical exam which includes emotional assessment and thorough exam of the heart. If there are any issues, you may be referred to a specialist. Remember that your emotional well-being can play a significant role on your physical well-being.

**Moving Forward**

As a patient you play an important role in your health care, the doctors you see will not have as much information about your health and your body as you. You are the one living in it. This makes you an important link to your good health.

Cancer survivors have undergone therapies that can potentially alter your heart and the overall cardiovascular system. There are some important things that you should be aware of concerning your cardiovascular health.
Your survivorship care team should discuss your risk of heart disease with you. In some cases they may refer you to a cardiologist. There are tests that can be done to evaluate the presence or level of heart disease.

Know these things about your health when talking to your doctor:

- your ejection fraction
- your blood pressure
- your medications
- your cholesterol
- your blood sugar and Hgb A1C if you have and elevated blood sugar
- the type and amount of chemotherapy (did you take an anthracycline based chemotherapy regimen?)
- the amount of radiation received, and what sites on your body you received the radiation

With these facts you as a cancer survivor will be the best advocate of your cardiovascular health. Remember to eat well, stop smoking and exercise. These are very important to lower your risk of heart disease, and you have control over them.

**Resources:**

MD Anderson Office of Cancer Survivorship
www.mdanderson.org/survivorship

Department of Cardiology

American Heart Association
www.heart.org/HEARTORG

American Cancer Society
www.cancer.org

The US Department of Health and Human Services National Institutes of Health National Heart, Lung, and Blood Institute

*Your Guide to Lowering Your Blood Pressure With DASH*
Your medical information:

Blood Pressure: ________________________________

Weight: ______________________________________

Chemotherapy Drugs: __________________________

   Anthracyclines ______________________________

Radiation Therapy: ______________________________

   Location ____________________________________

   Total dose __________________________________

   Last date given ______________________________

Goals for the future:

☐ Healthy Blood Pressure for me: __________________

☐ Healthy Weight for me: _________________________

Lifestyle factors to reduce my risk of heart disease. I will:

☐ quit smoking

☐ exercise more frequently

☐ control stress

☐ eat more fruits and vegetables

☐ use less amount of sodium

☐ continue routine health screenings

☐ other ________________________________________

Notes:

__________________________________________________________________________________

__________________________________________________________________________________

__________________________________________________________________________________

__________________________________________________________________________________
# Cardiac Medications

Though it is best to control heart health through diet and exercise, your doctor may prescribe one of these types of medications to prevent or treat heart disease. Tell all doctors about all the medications you are on.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Function</th>
<th>Examples</th>
<th>Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta Blockers</td>
<td>Beta blockers are frequently used in the treatment of cardiovascular disease. They help manage heart failure, coronary artery disease and certain arrhythmias (irregular heartbeats). These medications work by blocking receptors on the heart causing a decrease in heart rate and blood pressure.</td>
<td>Toprol XL® (metoprolol succinate) Lopressor® (metoprolol tartrate) Coreg® Coreg CR® (carvedilol) Zebeta® (bisoprolol) Tenormin® (atenolol) Bystolic® (nebivolol) Corgard® (labetalol) Inderal® (propranolol)</td>
<td>Beta blockers can trigger an asthma attack. Tell your doctor if you have asthma. Possible risks include: chest pain, difficulty breathing, slow heart beat or depression. They can also worsen congestive heart failure.</td>
</tr>
<tr>
<td>Ace Inhibitors</td>
<td>Angiotensin converting enzyme (ACE) inhibitors are used to treat high blood pressure and congestive heart failure. ACE Inhibitors block an enzyme in the body that indirectly causes blood vessels to contract. By blocking this enzyme, ACE inhibitors allow the blood vessels to relax. This lowers the blood pressure.</td>
<td>Capoten® (captopril) Zestril® (lisinopril) Vasotec® (enalapril) Altace® (ramipril) Accupril® (quinapril) Lostensin® (Benazepril)</td>
<td>ACE Inhibitors can cause birth defects. Tell your doctor if you are pregnant or if you think you might be pregnant. Risks include: dangerous swelling of the face, arms and legs, increase in potassium and a slight worsening of kidney function.</td>
</tr>
<tr>
<td>Angiotensin Receptor Blockers</td>
<td>Angiotensin Receptor blockers (ARBs) are used to treat high blood pressure and congestive heart failure. ARBs block an enzyme in the body that directly causes blood vessels to contract. By blocking this enzyme, ARBs allow the blood vessels to relax. This lowers the blood pressure.</td>
<td>Atacand® (candesartan) Diovan® (valsartan) Cozaar® (losartan) Benicar® (olmesartan) Micardis® (telmisartan)</td>
<td>ACE Inhibitors can cause birth defects. Tell your doctor if you are pregnant or if you think you might be pregnant. Risks include: dangerous swelling of the face, arms and legs, increase in potassium and a slight worsening of kidney function.</td>
</tr>
<tr>
<td>Loop Diuretics</td>
<td>Diuretics are used to treat fluid retention by eliminating excess fluid. They may lower blood pressure, increase urine output, reduce tissue swelling, reduce coughing, and reduce shortness of breath. These drugs reduce the workload of the heart, thereby reducing its need for blood and oxygen.</td>
<td>Lasix® (Furosemide) Demadex® (Toresemide) Bumex® (Bumetanide)</td>
<td>Weigh yourself daily while on diuretics to avoid dehydration. Risks include: dizziness, and lightheadedness. Insufficient potassium levels (either too high or too low) can cause irregular heartbeats. Tell your doctor if you experience an irregular heartbeat or palpitations.</td>
</tr>
<tr>
<td>Classification</td>
<td>Function</td>
<td>Examples</td>
<td>Precautions</td>
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<tr>
<td>Aldosterone Antagonists</td>
<td>This class of drugs treats fluid retention (edema), high blood pressure, congestive heart failure, and other conditions such as low potassium levels in the blood. These drugs block the actions of the hormone aldosterone. High levels of aldosterone can cause the kidneys to retain salt and water which can lead to edema and worsening of congestive heart failure.</td>
<td>Aldactone® (spironolactone)</td>
<td>Tell your doctor if you are pregnant. Tell your doctor if you have kidney disease or if you have ever had high levels of potassium in your blood.</td>
</tr>
<tr>
<td>Digoxin</td>
<td>Digoxin is used to increase exercise tolerance in heart failure patients and to treat irregular heartbeats. Digoxin improves the strength and efficiency of the heart. It can improve blood flow and slow down the heart rate.</td>
<td>Lanoxin® (digoxin)</td>
<td>Possible risks: irregular or slow heart beats. The risk becomes greater if you have kidney disease, heart disease, lung disease, arrhythmias, thyroid disorders, or electrolyte disorders.</td>
</tr>
<tr>
<td>Statins</td>
<td>These drugs are used to treat high cholesterol. They also have a protective effect on the heart and arteries helping to stabilize existing plaques.</td>
<td>Lipitor® (Atorvastatin)</td>
<td>Possible risks: muscle inflammation and kidney failure. Tell your doctor about all other medications, over-the-counter or herbal products you may be taking.</td>
</tr>
<tr>
<td>Amiodarone</td>
<td>Amiodarone is used to treat common arrhythmias such as atrial fibrillation and atrial flutter. It can also be used to treat adults with life-threatening ventricular arrhythmias.</td>
<td>Coradone®</td>
<td>Make sure your doctor knows if you have liver disease, heart disease, breathing problems or lung disease, eye or vision problems, high or low blood pressure, thyroid problems, or low potassium or magnesium in your blood. Using this medicine while you are pregnant can harm your unborn baby.</td>
</tr>
</tbody>
</table>
# Screening Tests for Heart Disease

Certain tests can be performed to detect heart disease. Below are some of these tests. Your doctor may request one of these as part of your health evaluation.

<table>
<thead>
<tr>
<th>Screening Test</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain Natriuretic Peptide (BNP)</td>
<td>BNP is a neurohormone that is secreted into the blood by the heart when the heart muscle is stretched. This blood test can be helpful to determine if the patient is having problems with the heart or lungs.</td>
</tr>
<tr>
<td>Troponin</td>
<td>Can be measured in the blood to diagnosis heart muscle damage. This test is useful when a patient has a heart attack.</td>
</tr>
<tr>
<td>Electrocardiogram (ECG or EKG)</td>
<td>Traces the electrical activity of the heart. Electrodes are placed in predetermined positions on the chest and limbs. It provides an electrical picture of the heart from various angles. This test is useful in diagnosing blockages in the heart, inflammation of the heart, and arrhythmias.</td>
</tr>
<tr>
<td>Echocardiogram</td>
<td>An ultrasound of the heart that is used to diagnosis many forms of heart disease. The amount of blood the heart is able to empty is called the ejection fraction. The normal ejection fraction is 55-60%. This means that the heart empties 55-60% of its blood with each contraction. A decreased ejection fraction is an indicator that the patient has systolic dysfunction. Valves can be visualized with the echocardiogram which will help diagnosis valvular disease. Pericardial effusions are often diagnosed with echocardiogram by evaluating the fluid in the pericardial sac. A physician is also able to use the echocardiogram to look at the motion of the left ventricle walls.</td>
</tr>
<tr>
<td>Stress Test</td>
<td>These tests are used to evaluate areas in the heart that may not be getting appropriate blood supply. Several different types of stress tests can be used to evaluate patients that are suspected of having these issues. There are exercise stress and chemical stress tests. Some also use nuclear isotope and others evaluate the function with echocardiogram. The cardiologist will choose the type that is appropriate for the patient.</td>
</tr>
<tr>
<td>Cardiac Catheterization</td>
<td>An invasive test that provides the doctor with visualization of the heart by injecting dye. This test can be useful in diagnosing problems with valves, abnormal left ventricular function and blockages of the coronary arteries.</td>
</tr>
<tr>
<td>Carotid Ultrasound</td>
<td>A painless procedure that uses sound waves to examine the structures and function of the carotid arteries in the neck. This test can be useful to detect narrowing, or stenosis of the carotid arteries.</td>
</tr>
<tr>
<td>Cardiac CT Angiogram</td>
<td>A non-invasive test in which dye is used to visualize the coronary arteries with the use of a CT scanner. Calcium and plaque buildup in the coronary arteries can be detected with this test. Very useful tool in patients receiving chemotherapy.</td>
</tr>
<tr>
<td>Doppler Ultrasound</td>
<td>An ultrasound used to evaluate for blood clots in the extremities. Sound waves are used to measure blood flow in the veins.</td>
</tr>
<tr>
<td>Carotid intimal Thickness</td>
<td>An ultrasound of the carotid arteries. This test is a measurement of the intimal layer of the carotid artery. A thickened carotid intima can be indicative of accelerated atherosclerotic disease.</td>
</tr>
</tbody>
</table>