

The Basics of Heart Failure

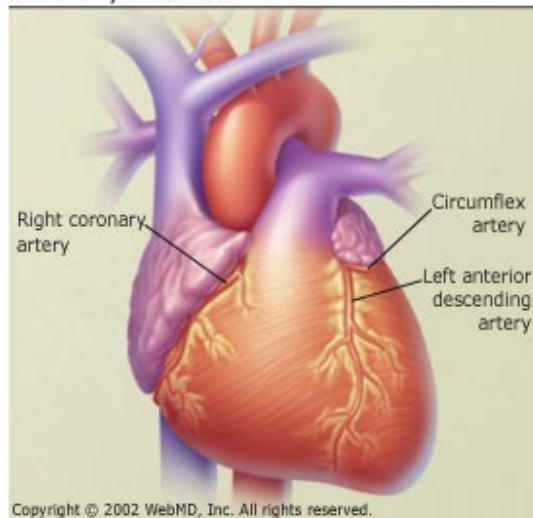
Heart failure affects about 5 million Americans. Roughly 550,000 people are diagnosed with heart failure each year. It is the leading cause of hospitalization in people older than 65.

What Is Heart Failure?

Heart failure does not mean the heart has stopped working. Rather, it means that the heart's pumping power is weaker than normal. With heart failure, blood moves through the heart and body at a slower rate, and pressure in the heart increases. As a result, the heart cannot pump enough oxygen and nutrients to meet the body's needs. The chambers of the heart respond by stretching to hold more blood to pump through the body. This helps to keep the blood moving, but in time, the heart muscle walls weaken and are unable to pump as strongly. As a result, the kidneys often respond by causing the body to retain fluid (water) and sodium. If fluid builds up in the arms, legs, ankles, feet, lungs, or other organs, the body becomes congested. Congestive heart failure is the term used to describe this condition.

What Causes Heart Failure?

Coronary Arteries



Heart failure is caused by many conditions that damage the heart muscle, including:

- **Coronary artery disease:** CAD, a disease of the arteries that supply blood and oxygen to the heart, causes decreased blood flow to the heart muscle. If the arteries become blocked, the heart becomes starved for oxygen and nutrients. This condition along with heart attack is responsible for two thirds of heart failure cases in the U.S.

- **[Heart attack](#)**: A heart attack may occur when a coronary artery becomes suddenly blocked, stopping the flow of blood to the heart muscle and damaging it. All or part of the heart muscle becomes cut off from its supply of oxygen. A heart attack can damage the heart muscle, resulting in a scarred area that does not function properly.
- **["Non-ischemic" cardiomyopathy](#)**: This condition occurs when there is damage to the heart muscle from causes other than artery or blood flow problems, such as from infections or alcohol or drug abuse.
- **Conditions that overwork the heart**: [High blood pressure](#) (hypertension), [valve disease](#), thyroid disease, kidney disease, diabetes, or heart defects present at birth can all cause heart failure (some of these are non-ischemic cardiomyopathy -- see above). In addition, heart failure can occur when several diseases or conditions are present at once.

What Are the Symptoms of Heart Failure?

The symptoms of heart failure are related to the changes that occur to your heart and body, and may be moderate to severe, depending on how weak your heart is. The [symptoms](#) can include:

- **Congested lungs**. Fluid back up in the lungs can cause shortness of breath with exercise or difficulty breathing at rest which is often worse when lying flat in bed. Lung congestion can also cause a dry, hacking cough or wheezing.
- **Fluid and water retention**. Less blood to your kidneys causes fluid and water retention, resulting in swollen ankles, legs, and abdomen (called edema) and weight gain. Symptoms may cause an increased need to urinate during the night. Bloating in your stomach may cause a loss of appetite or nausea.
- **Dizziness, fatigue, and weakness**. Less blood to your major organs and muscles makes you feel tired and weak. Less blood to the brain can cause dizziness or confusion.
- **Rapid or irregular heartbeats**. The heart beats faster to pump enough blood to the body. This can cause a fast or irregular heartbeat.

If you have heart failure, you may have one or all of these symptoms or you may have none of them. In addition, your symptoms may not be related to how weak your heart is; you may have many symptoms but your heart function may be only mildly weakened. Or you may have a more severely damaged heart but have no symptoms.

What Are the Types of Heart Failure?

Systolic cardiac dysfunction (or systolic heart failure) occurs when the heart muscle doesn't contract with enough force, so there is not enough oxygen-rich blood to be pumped throughout the body.

Diastolic cardiac dysfunction (or diastolic heart failure) occurs when the heart contracts normally, but the ventricle doesn't relax properly reducing the amount of blood that can enter the heart and causing blood to back up into the lungs.

A measurement called the ejection fraction is determined to calculate how well your heart pumps with each beat to determine if systolic or diastolic dysfunction is present.

In patients with systolic heart failure, the ejection fraction is less than 40% and the heart has several characteristics on imaging studies such as dilated left ventricle, and reduced output of the heart.

In contrast, patients with diastolic heart failure usually have a normal ejection fraction, normal heart pumping capability, but the imaging studies show that the heart has impaired filling.

How Is Heart Failure Diagnosed?

To diagnose heart failure, your doctor will ask you many questions about your symptoms and medical history to identify whether you are at risk for the condition. You will be asked about any conditions you have that may cause heart failure (such as coronary artery disease, angina, diabetes, heart valve disease, and high blood pressure). You will be asked if you smoke, take drugs, drink alcohol (and how much you drink), and about what medications you take.

You will also do a [physical exam](#). Your doctor will listen to your heart and look for other illnesses that may have caused your heart failure.

Your doctor may also order other tests to determine the cause and severity of your heart failure. These include:

- **Blood tests.** Blood tests are used to evaluate kidney and thyroid function as well as to check cholesterol levels and the presence of anemia. Anemia is a blood disorder that occurs when there is not enough hemoglobin (the substance in red blood cells that enables the blood to transport oxygen through the body) in a person's blood.
- **[B-type natriuretic peptide \(BNP\) blood test](#).** BNP is a substance secreted from the heart in response to changes in pressure that occur when heart failure develops and worsens. The level of BNP in the blood increases when heart failure symptoms worsen, and decreases when the heart failure condition is stable.
- **Chest X-ray.** Chest X-ray shows the size of your heart and whether there is fluid build-up around the heart and lungs.
- **[Echocardiogram](#).** This test (often called an "echo") shows a graphic outline of the heart's movement. During an echo, a wand is placed on the surface of your chest. This wand sends ultrasound waves that provide pictures of the heart's valves and chambers so the pumping action of the heart can be studied. Echo is

- often combined with Doppler ultrasound and color Doppler to evaluate blood flow across the heart's valves. [Ejection fraction](#) can also be measured.
- **Electrocardiogram (EKG or ECG).** ECG records the electrical impulses traveling through the heart. During the test, small, flat, sticky patches called electrodes are placed on your chest. The electrodes are attached to an electrocardiograph monitor (ECG) that charts your heart's electrical activity on graph paper.

How Is Heart Failure Treated?

Today there are more options available to treat heart failure than ever before. [Regular medications](#) and [lifestyle](#) changes coupled with careful monitoring is the first line of treatment. As the condition progresses, centers specializing in the treatment of heart failure can offer more advanced treatment options, such as surgery.

How Can I Prevent my Heart Failure From Worsening?

To prevent your heart failure from worsening:

- [Keep your blood pressure low.](#) In heart failure, the release of hormones causes the blood vessels to constrict or tighten. The heart must work hard to pump blood through the constricted vessels. It is important to keep your blood pressure as low as possible, so that your heart can pump effectively without extra stress.
- [Monitor your own symptoms.](#) Check for changes in your fluid status by weighing yourself daily and checking for swelling.
- **Schedule regular doctor appointments.** During follow-up visits, your doctors will make sure you are staying healthy and that your heart failure is not getting worse. Your doctor will ask to review your weight record and list of medications. If you have questions, write them down and bring them to your appointment. Call your doctor if you have urgent questions. Notify all your doctors about your heart failure, medications, and any restrictions. Also, check with your heart doctor about any new drugs prescribed by another doctor. Keep good records and bring them with you to each doctor visit.

How Can I Prevent Further Heart Damage?

To help prevent further heart damage:

- [Stop smoking or chewing tobacco.](#)
- Reach and maintain your healthy weight.
- Control high blood pressure and diabetes.
- [Exercise regularly.](#)
- Do not drink alcohol.
- Have surgery or other procedures to treat your heart failure or what may have caused it.

How Can I Lessen My Heart Failure Symptoms?

To lessen heart failure symptoms:

- **Maintain fluid balance.** Your doctor may ask you to keep a record of the amount of fluids you drink or eat and how often you go to the bathroom. Remember, the more fluid you carry in your blood vessels, the harder your heart must work to pump excess fluid through your body. Limiting your fluid intake to less than two liters per day will help decrease the workload of your heart and prevent symptoms from recurring.
- **Limit how much [salt](#) you eat.**
- **Monitor your weight and lose weight if needed.** Learn what your "dry" or "ideal" weight is. This is your weight without extra water (fluid). Your goal is to keep your weight within four pounds of your dry weight. Weigh yourself at the same time each day, preferably in the morning, in similar clothing, after urinating but before eating, and on the same scale. Record your weight in a diary or calendar. If you gain two pounds in one day or five pounds in one week, call your doctor. Your doctor may want to adjust your medications.
- **Monitor your symptoms.** Call your doctor if new [symptoms](#) occur or if your symptoms worsen. Do *not* wait for your symptoms to become so severe that you need to seek emergency treatment.
- **Take your medications as prescribed.** [Medications](#) are used to improve your heart's ability to pump blood, decrease stress on your heart, decrease the progression of heart failure and prevent fluid retention. Many heart failure drugs are used to decrease the release of harmful hormones. These drugs will cause your blood vessels to dilate or relax (thereby lowering your blood pressure).

What Medications Should I Avoid if I Have Heart Failure?

Several different types of medications are best avoided in those with heart failure. These include:

- Certain painkillers called non-steroidal anti-inflammatory drugs (NSAIDs), such as Motrin.
- Most arrhythmia drugs.
- Most calcium channel blockers (especially older versions like Calan, Cardizem, Covera, Isoptin) if you have systolic heart failure.
- Some nutritional supplements and growth hormone therapies.
- Antacids that contain salt.
- Decongestants such as Sudafed (they make your heart work harder).

If you are taking any of these drugs, discuss them with your doctor. It is important to know the names of your medications, what they are used for, and how often and at what times you take them. Keep a list of your medications and bring them with you to each of your doctor visits. Never stop taking your medications without discussing it with your

doctor. Even if you have no symptoms, your medications help your heart pump more effectively.

How Can I Improve My Quality of Life With Heart Failure?

- **Eat a healthy diet.** Limit your consumption of salt (sodium) to less than 2,000 milligrams (2 grams) each day. Eat foods high in fiber and potassium. Limit foods high in fat, cholesterol, and sugar. Reduce total daily intake of calories to lose weight if necessary.
- **Exercise regularly.** A regular cardiovascular exercise program, prescribed by your doctor, will improve symptoms and strength and make you feel better. It may also decrease heart failure progression.
- **Don't overdo it.** Plan your activities and include rest periods during the day. Certain activities, such as pushing or pulling heavy objects and shoveling may worsen heart failure.
- **Prevent respiratory infections.** Ask your doctor about flu and pneumonia vaccines.
- **Take your medications as prescribed.** Do not stop taking them without first contacting your doctor.
- **Get emotional or psychological support if needed.** Heart failure can be difficult for your whole family. If you have questions, ask your doctor or nurse. If you need emotional support, social workers, psychologists, clergy, and heart failure support groups are a phone call away. Ask your doctor or nurse to point you in the right direction.

What Surgeries Are Used to Treat Heart Failure?

Surgery is aimed at stopping further damage to the heart and improving the heart's function. Procedures used include:

- **Left ventricular assist device (LVAD):** The LVAD helps your heart pump blood throughout your body. It allows you to be mobile, sometimes returning home to await a heart transplant.
- **Bypass surgery :** The most common surgery for heart failure is bypass surgery to circumvent a blocked heart artery.
- **Heart valve surgery :** As heart failure progresses, the heart valves that normally help direct the flow of blood through the heart to the rest of the body stretch out of shape allowing blood to "leak" backwards. The valves can be repaired or replaced.
- **Infarct exclusion surgery (Modified Dor or Dor Procedure):** When a heart attack occurs in the left ventricle (left lower pumping chamber of the heart), a scar forms. The scarred area is thin and can bulge out with each beat (an aneurysm). A heart surgeon can remove the dead heart tissue or the aneurysm.

- **Heart transplant:** A heart transplant is considered when heart failure is so severe that it does not respond to all other therapies, but the person's health is otherwise good.

Heart Failure Treatment Is a Team Effort

Heart failure management is a team effort, and you are the key player on the team. Your heart doctor will prescribe your medications and manage other medical problems. Other team members, including nurses, dietitians, pharmacists, exercise specialists, and social workers, will help you achieve success. But it is up to you to take your medications, make dietary changes, live a healthy lifestyle, keep your follow-up appointments, and be an active member of the team.

What Is the Outlook for People With Heart Failure?

If you have heart failure, your prognosis or outlook for the future will depend on how well your heart muscle is functioning, your symptoms, and how well you respond to and follow your treatment plan. With the right care, heart failure will not stop you from doing the things you enjoy.

Everyone with a long-term illness, such as heart failure, should discuss their desires for extended medical care with their doctor and family. An "advance directive" or "living will" is one way to let everyone know your wishes. A living will expresses your desires about the use of medical treatments to prolong your life. This document is prepared while you are fully competent in case you are unable to make these decisions at a later time.