

Heart Rhythm Problems

The Heart Failure Society of America (HFSA) is a non-profit organization of health care professionals and researchers who are dedicated to enhancing quality and duration of life for patients with heart failure and preventing the condition in those at risk. These educational modules have been developed to help patients, their families, and individuals at risk for heart failure understand and cope with the disease. For more information about the Society please visit our web site www.hfsa.org.

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Heart Failure Society
of America

Contact Information

Please write down important contact information in the space below. You may also want to share this information with family members and friends.

Doctor Treating Me for Heart Failure:

Name:

Address:

City:

State:

Zip:

Phone number:

Fax:

E-mail:

Other Important Phone Numbers:

Ambulance, fire department, or emergency services: **911**

Pharmacy:

Other doctors or nurses:

Introduction

Normally, the heart beats in a regular and coordinated way like a clock or metronome. However, many people with heart failure may have a heart that beats irregularly and/or too fast or too slow. These rhythm changes are often referred to as arrhythmias or dysrhythmias. They are often benign, which means these rhythm problems do not cause problems and are not related to any known abnormality of the heart. But arrhythmias may also be due to changes in the heart from either heart failure or a previous condition such as a heart attack or long-standing high blood pressure. Under these circumstances arrhythmias may be dangerous and are important to understand and treat. With proper treatment and self-care, people with heart failure can lead normal, active lives even if they also have a heart rhythm problem.

This module will provide basic information about:

- Types of heart rhythm problems.
- The diagnosis, treatment, and prevention of heart rhythm problems.
- What your family and friends should know about heart rhythm problems.

It will help you:

- Recognize the symptoms of a heart rhythm problem.
- Understand what happens to the heart during different rhythm problems.
- Learn about the medicines and devices used to treat heart rhythm problems.
- Learn what you can do to reduce heart rhythm problems.

What are Heart Rhythm Problems?



The heart has an electrical system that causes the heart to beat and pump blood. During a normal heart beat, an electrical signal is first made in a small group of cells called the sinus node. This node tells the heart when to beat. The electrical signal then spreads throughout the atria or upper chambers of the heart to another group of cells called the AV node. Finally, the electrical signal travels to the ventricles or lower chambers of the heart. The AV node connects the upper and lower chambers of the heart. A pulse occurs each time the heart beats and pumps blood. An electrocardiogram (ECG) shows the electrical activity of the heart.



You may develop a heart rhythm problem if any part of this conduction system is damaged. For example, a rhythm problem may occur if an irritable heart cell starts a beat early, or if the electrical signal takes a detour through a part of the heart where a signal doesn't normally travel. Similarly, a problem in the AV node can cause a rhythm problem by blocking the electrical signals instead of allowing them through to the lower chambers of the heart.



Symptoms of Heart Rhythm Problems

You may not know if you have a heart rhythm problem. Many heart rhythm problems can be minor and harmless. People with healthy hearts have heart rhythm disturbances from time to time. However, heart rhythm problems in people with heart failure can be serious and make heart failure worse if they are not treated.

Be alert to symptoms that may be caused by heart rhythm problems including:

- Skipped heart beats.
- A “fluttering” or pounding feeling in the chest.
- Feeling dizzy or light-headed.
- Sudden shortness of breath.
- Periodic weakness.
- Fainting or sudden loss of consciousness.

These symptoms may happen because your heart is beating irregularly or too fast or too slow. Let your doctor or nurse know if you experience any of these symptoms.

Types of Heart Rhythm Problems

There are many types of heart rhythm problems. In general, they can be described as:

- Irregular
- Too fast (also known as a tachyarrhythmia)
- Too slow (also known as a bradyarrhythmia)

The following sections will describe some of the heart rhythm problems people with heart failure commonly experience in more detail.

Irregular Heart Rhythms

Here are two common reasons that an irregular heart rhythm may occur in people with heart failure:

- Extra heart beats cause the heart to beat earlier than normal. These extra heart beats are referred to as Premature Atrial Complexes (PACs) or Premature Ventricular Complexes (PVCs) depending on whether they start in the upper (atria) or lower (ventricles) chambers of the heart.
- An irregular heart rhythm can also be caused by conditions called sinus pause, sinus arrest, or sick sinus syndrome. In these conditions the sinus node, which generates signals causing the heart to beat, does not start the beats regularly or starts them too slowly. Sick sinus syndrome can be common in the elderly.

Fast Heart Rhythms

Atrial Fibrillation

Atrial fibrillation is an irregular and usually rapid heart rhythm in the upper chambers of the heart. It occurs when many electrical impulses are generated instead of the single impulse in the sinus node that starts the beat.

Atrial fibrillation is the most common heart rhythm abnormality in the general population. Atrial fibrillation is common in people with heart failure. It can occur on and off, or a person can have this rhythm all of the time. Blood is still being pumped from the upper to lower heart chambers when someone is having atrial fibrillation. However, some blood can pool in the upper chambers of the heart, and this can lead to the formation of blood clots which can cause a stroke. Anticoagulant medicines (commonly called blood thinners) are often prescribed for people with persistent atrial fibrillation to help reduce the chance of a stroke.

Supraventricular Tachycardia

Supraventricular tachycardia is a fast heart rhythm that starts in the upper chambers of the heart. Several early beats that start in the upper chambers of the heart can take over the heart rhythm and speed it up. This rhythm is sometimes called paroxysmal supraventricular tachycardia (PSVT) or paroxysmal atrial tachycardia (PAT). Paroxysmal means starting suddenly.

Ventricular Tachycardia

Ventricular tachycardia is a rapid heart rhythm that involves the lower chambers of the heart. This rhythm problem can become life-threatening and requires urgent treatment. A person who has had a heart attack or other changes in heart muscle is at risk for developing this type of rhythm problem.

Ventricular Fibrillation

Ventricular fibrillation is an irregular and rapid heart rhythm that results in chaotic, uncoordinated quivering (like a bowl of jello) in the lower chambers of the heart. This is the most serious heart rhythm problem, because no blood is pumped out of the heart during this rhythm disturbance. Ventricular fibrillation causes loss of consciousness and leads to sudden cardiac arrest unless a normal rhythm is restored through immediate cardiopulmonary resuscitation (CPR) and/or by delivering a defibrillation shock. This is why friends and family members of people with heart problems are encouraged to learn CPR and know emergency contact procedures.

Slow Heart Rhythms

Heart Block

Heart block occurs when electrical signals from the upper chambers of the heart can not travel to the lower chambers along the normal pathway because of damage to the AV node. Depending on the degree of heart block, the electrical impulses that cause the heart to beat may be slowed or partially blocked. A person with a slow or irregular heart beat may experience fatigue and/or dizziness or could lose consciousness.

Diagnosing Heart Rhythm Problems

Tests are available to help your doctor evaluate your heart rhythm problem and guide your care. Commonly used tests will be described in the following section.

Electrocardiogram (ECG)

An ECG is a simple way to record the electrical activity of the heart. To record an ECG, adhesive patches (electrodes) are placed on the patient's chest, arms, and legs. The patches are attached to wires and connected to a machine that records the electrical activity of your heart on graph paper. The test does not hurt.

This test may be performed in one of three ways depending on the type of information needed.

- A regular ECG done while the patient is resting.
- An exercise ECG done while the patient is walking on a moving treadmill. This test allows a doctor to check the electrical activity and how much oxygen is getting to the heart while the heart rate is increased. A patient may get tired from exercising during this test.
- A signal-averaged ECG is a special way of recording an ECG that allows the doctor to enlarge certain parts of the electrical tracing to better evaluate a patient's risk of developing a serious heart rhythm problem.

Holter Monitor

A Holter monitor is a small portable device used to make a tape recording of an ECG over a longer period of time. It helps pick up rhythm problems that may occur during normal daily activities that may not be detected on an ECG done for a short time in the doctor's office.

To make a Holter recording, electrodes (adhesive patches) are attached to the body and to a small portable monitor. Patients are asked to wear the monitor over their shoulder for 24 to 48 hours and to keep a diary of their symptoms. After the test is done, the tape is sent to a lab for analysis. The patient's symptoms are also compared to the recorded ECG. A Holter test is painless, but some people find the monitor although lightweight, cumbersome to wear.

Tilt Table

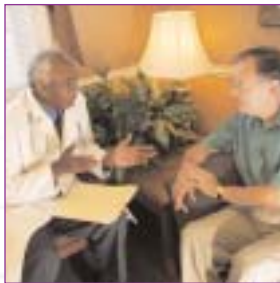
A tilt table test involves monitoring a patient's ECG and blood pressure while the bed is tilted upwards. The patient's head is up, and his or her feet rest on a footboard. The test allows a doctor to evaluate how a patient's heart rhythm and blood pressure response to position changes. Sometimes, medicines are given through a needle in the vein during the test. Patients are asked to report any symptoms they experience during the test such as light-headedness.

Diagnosing Heart Rhythm Problems (*cont.*)



Electrophysiology (EP) Study

An EP study is a test in which special catheters (thin insulated wires) are inserted into a blood vessel and threaded into the heart to record its electrical activity. A doctor specializing in heart rhythm problems called an electrophysiologist performs the test. An EP study is done in the hospital electrophysiology laboratory on an outpatient basis. During an EP study, the doctor will try to provoke a heart rhythm problem to pinpoint its starting location in the heart and evaluate how a patient responds to the abnormal rhythm. It also allows the doctor to test the effect of certain medicines on the abnormal rhythm.



The patient is slightly sedated during an EP test. He or she receives medicine to numb the site where the catheter is inserted and sedatives to feel comfortable during the test. After the test, the catheters are removed, and pressure is applied to the insertion site. The patient is then monitored in the hospital and usually discharged the same day. The patient may experience some discomfort from the needle insertion, but the test is usually fairly short.



Treating Heart Rhythm Problems

After your heart rhythm problem has been diagnosed, your doctor will develop a treatment plan that is right for you. Your treatment plan may include medicine, surgery, and/or an implantable device depending on the type of heart rhythm problem and your symptoms. Treatments for heart rhythm problems are described in more detail in the following sections.



Medicines

Antiarrhythmics

Many medicines can be used to control heart rhythm problems. These medicines are called antiarrhythmics.

Anticoagulants

People with atrial fibrillation need to take anticoagulant medicines (blood thinners) to help prevent blood clots and decrease the risk of stroke. People with heart failure (and their families) should receive specific instructions about caring for themselves while on a blood thinner. They should also be monitored carefully by a doctor or nurse.

If you take a blood thinner, you should:

- Take the medicine daily.
- Call your doctor or nurse for directions about what to do if you miss a dose.
- Keep all appointments for checking your blood clotting ability.
- Notify your doctor or nurse of any bruising or bleeding.
- Keep the amount of green vegetables and fish in your diet consistent, because dramatic changes in your intake of these foods, which are high in vitamin K, can cause unwanted fluctuations in the effect of blood thinners.
- Tell your dentist and other health care providers you are taking a blood thinner.
- Tell your doctor or nurse if you are taking herbal supplements.

Refer to Module 3: Heart Failure Medicines for more information and tips on taking heart failure medicines.

Procedures

Implantable Devices

Cardioversion

Cardioversion is a procedure in which an electrical shock is used to restore the normal heart rhythm. Cardioversion is done in the hospital. A defibrillation shock is delivered through pads applied to the patient's chest while their ECG is monitored. The patient receives medicine to make them feel drowsy before the cardioversion procedure, so they are less likely to feel the shock.

Catheter Ablation

Catheter ablation is a procedure used to correct some types of rhythm problems that cause the heart to beat too fast. It is performed in the electrophysiology laboratory using techniques similar to those used in an EP study. First a catheter is used to pinpoint the area of the heart where an abnormal pathway is causing a rhythm problem. An electrode is then used to destroy the small spot in the heart that is causing the rhythm problem.

In some patients with a heart rhythm problem, an implantable device can be used to automatically monitor and correct a rhythm that is irregular or too fast or too slow. The device corrects the rhythm using either small painless electrical impulses or a defibrillation shock as needed.

Implantable devices used in heart failure patients include pacemakers, implantable cardioverter defibrillators (ICDs), or combination devices. The devices look like small metal cans and contain the computer circuitry and a battery. Lead wires connect the devices to the heart. The devices are about the size of a small pocket watch, but may get even smaller in the future.

The device is usually implanted on an outpatient basis using local anesthesia. People with an implantable device must still take medicines as directed and follow self-care recommendations. They must also have their device checked regularly and follow any recommendations regarding their daily activities and work. There may also be restrictions on driving.

Pacemaker

A pacemaker is used primarily to treat a very slow heart rate. This device monitors the patient's heart rate and sends small and painless electrical impulses to start each heart beat as needed. Pacemakers today are small and do not change the patient's appearance.

Implantable Devices (*cont.*)

Implantable Cardioverter Defibrillator (ICD)

An ICD is a device that is used to treat very fast heart rates. It is inserted in the body with lead wires in a similar way to a pacemaker. An ICD can stop heart rates that are too fast and restore a normal rhythm by delivering painless pacing impulses or a more noticeable shock. ICDs are used in people considered at higher risk for having serious rhythm problems in the lower chambers of their heart such as ventricular tachycardia and/or ventricular fibrillation.

Other Heart Failure Devices

In some people with heart failure, conduction through the heart is slowed, and the electrical impulse that signals one or both of the heart's lower chambers (ventricles) to beat may be delayed. As a result, the heart may beat in an uncoordinated way. A new type of pacemaker can help coordinate the heart's pumping action. This type of therapy may be called biventricular pacing or cardiac resynchronization therapy (CRT). These new pacemakers send impulses to the right and left side of the heart in an attempt to coordinate the pumping action of the heart muscle. Some of these heart failure pacemakers also contain an ICD. These devices are currently reserved for patients who continue to have symptoms even though medicines are being taken as prescribed.

Your doctor can determine if a device is right for you by performing an ECG and an echocardiogram (echo) and determining if you are on the proper heart failure medications. An echocardiogram is a test used to evaluate the flow of blood through your heart and valves and the function of the walls of your heart.



Things that may Aggravate Heart Rhythm Problems and Suggestions to Minimize Them



A number of factors may aggravate heart rhythm problems including:

- Drug interactions, including over-the-counter medications such as cough or cold medicines.
- Abnormal blood chemistry levels such as potassium.
- Exercising too vigorously.

You may be able to minimize heart rhythm problems by:

- Making sure to ask your doctor or nurse before taking over-the-counter remedies including nutritional supplements.
- Reporting symptoms of muscle cramps, nausea and/or vomiting, unusual fatigue, weakness, or dry mouth as these may be signs of potassium imbalance.
- Drinking less alcohol.
- Quitting smoking.
- Consulting with your doctor or nurse about an exercise prescription.
- Taking all of your medicines as directed.

Sometimes heart rhythm problems are caused by other illnesses. For example, if you get sick with a stomach problem and have vomiting or diarrhea, it is important to replace the normal electrolytes that are lost. Your heart's electrical system needs electrolytes such as potassium to work properly. So it is important to notify your doctor or nurse if you have these illnesses and experience the symptoms of a heart rhythm problem listed on page 4.

What Family and Friends Should Know

Family and friends can help by learning about the heart rhythm problems their family member has. They can also monitor for symptoms and assist in seeking help when needed.

For example, friends and family should know:

- Which symptoms are expected and which ones indicate a need for help.
- How to access the emergency medical system (911).
- The patient's wishes for advanced life support in the event they should have a cardiac arrest.
- CPR, if possible.

Refer to Module 7: Tips for Family and Friends and Module 9: Advance Directives for additional information on how family members can help a person with heart failure.

Questions to Ask Your Doctor or Nurse

Do I have a heart rhythm problem?

Reason for asking this question: Heart rhythm problems are common in people with heart failure. Knowing your risk can help you take better care of yourself, take steps to reduce heart rhythm problems, develop a plan for emergency care, and stick to your overall self-care plan. It can also help family and friends provide the best support.

Is my heart rhythm problem under control?

Reason for asking this question: Heart rhythm problems can worsen heart failure. Your doctor can determine your risk for these problems and the best approaches for prevention and treatment.

Learn More

You can learn more about how to take control of your heart failure by reading the other modules in this series. You can get copies of these modules from your doctor or nurse, as they become available. Or you can check the Heart Failure Society of America web site at: www.hfsa.org.

The topics covered in the other modules include:

- Introduction: Taking Control of Heart Failure
- How to Follow a Low-Sodium Diet
- Heart Failure Medicines
- Self-Care: Following Your Treatment Plan and Dealing with Your Symptoms
- Exercise and Activity
- Managing Feelings About Heart Failure
- Tips for Family and Friends
- Lifestyle Changes
- Advance Directives
- How to Evaluate Claims of New Heart Failure Treatments and Cures

These modules are not intended to replace regular medical care. You should see your doctor or nurse regularly. The information in these modules can help you work better with your doctor or nurse.

