

How CRTs Work



Cardiac resynchronization therapy (CRT) devices help your heart beat more efficiently and monitor your condition so your doctor can provide the right treatment for you. Find out more about how your device works below.

About Heart Failure

If you have heart failure, your heart doesn't pump as well as it should, so your blood doesn't circulate as well as it should to supply your body with the oxygen and nutrients it needs to thrive. In a healthy heart, both ventricles (lower part of the heart) pump or beat at exactly the same time in a coordinated way. It's like making a fist—all of the fingers squeeze in unison. But for many people with heart failure, the ventricles do not pump at the same time. It's like making a fist just one finger at a time.

[Learn More](#)

What is a CRT Device?

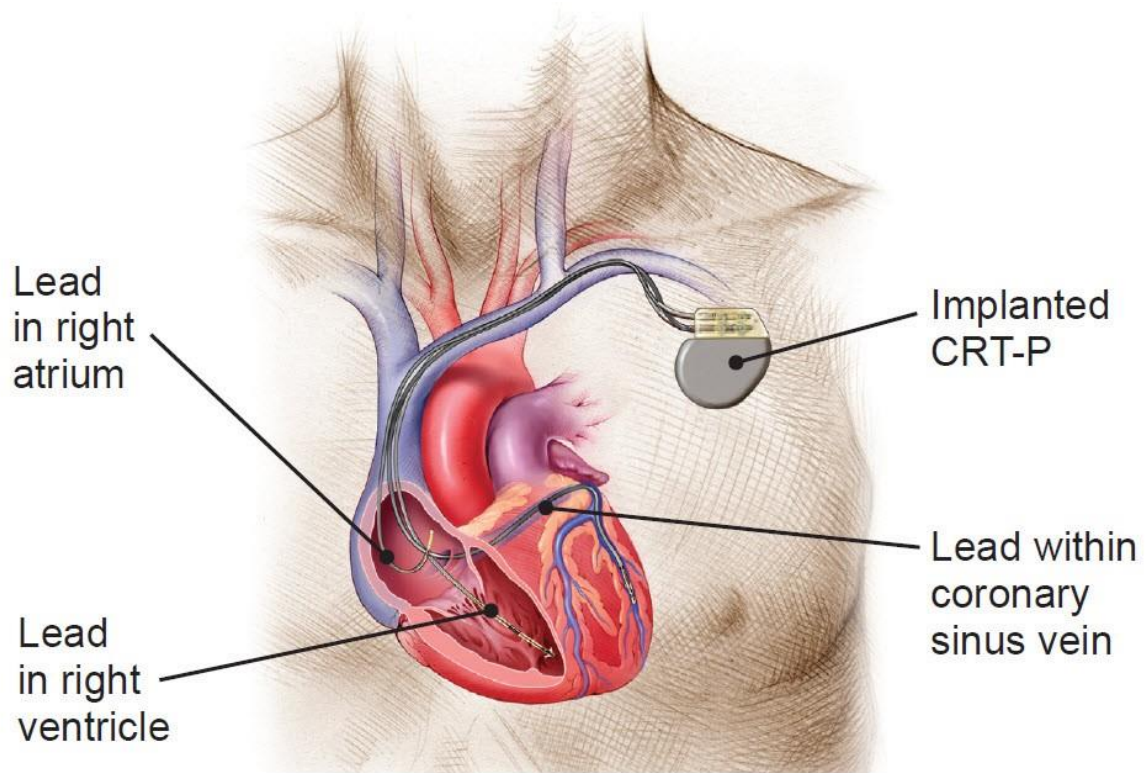
A CRT system consists of two components—the pulse generator, or device, and thin, insulated wires called leads. A CRT device delivers tiny amounts of electrical energy to the heart through these leads. This helps restore the normal timing of the heartbeats, causing both ventricles to pump together more efficiently like a fist closing normally again.

Types of CRTs

There are two types of CRT devices. One is a special kind of pacemaker. It's called a cardiac resynchronization therapy pacemaker (CRT-P) or "biventricular pacemaker." The other is the same device, but it also includes a built-in implantable cardioverter defibrillator (ICD). This type is called a cardiac resynchronization therapy defibrillator (CRT-D).

How CRT-P Devices Work

While functioning like a normal pacemaker to treat slow heart rhythms, a CRT-P device also delivers small electrical impulses to the left and right ventricles to help them contract at the same time so your heart pumps more efficiently.

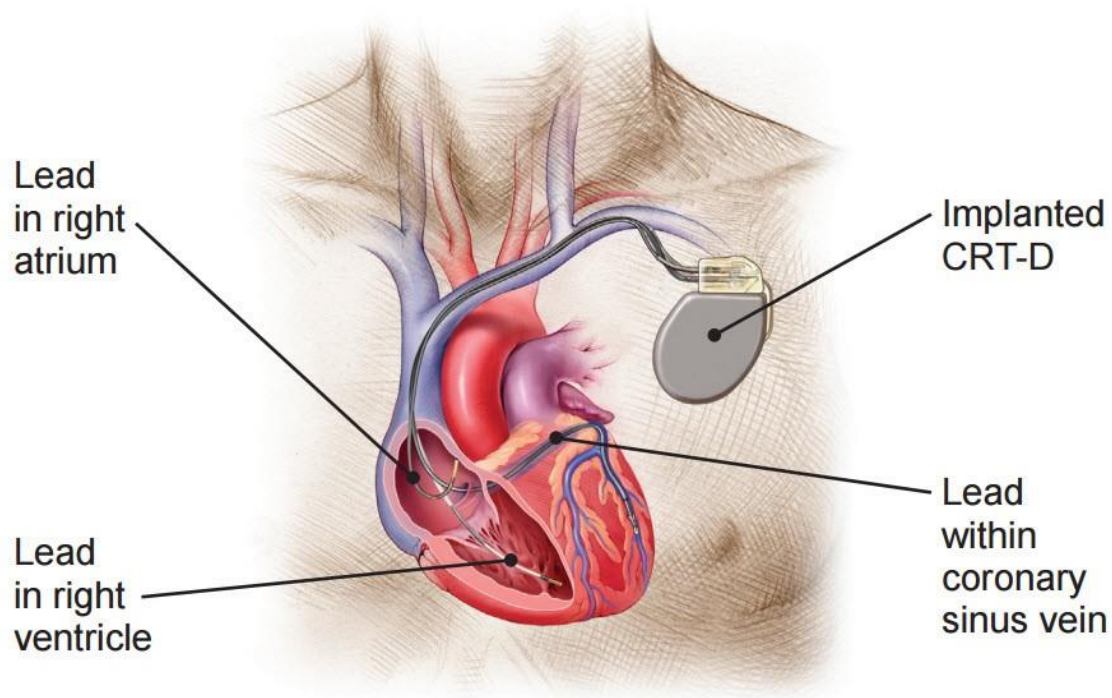


An implanted CRT-P system.

How CRT-D Devices Work

A CRT-D is a special device for heart failure patients who are also at high risk for sudden cardiac death. While functioning like a normal pacemaker to treat slow heart rhythms, a CRT-D device also delivers small electrical impulses to the left and right ventricles to help them contract at the same time. This will help your heart pump more efficiently.

A CRT-D device can also treat dangerously fast heart rhythms (arrhythmias) that can lead to sudden cardiac arrest. If the device senses heartbeats that are dangerously fast, it delivers a shock to the heart. This shock (defibrillation) stops the abnormal rhythm. Without this life-saving therapy, the dangerously rapid rhythm could lead to death in just minutes.



An implanted CRT-D system.

Your CRT Device Battery

Just like any battery, the battery in your CRT-P or CRT-D will run out over time. Since the battery is permanently sealed inside your device, it can't be replaced when its energy is depleted. So if your battery runs out, your entire device will need to be replaced. The battery life depends on the settings your doctor programs and how much therapy you receive.

Your CRT device will regularly check its own battery and your doctor will check to see how much energy it has left at each follow-up visit. In addition, your doctor can turn on a feature that makes your device beep when replacement time is near. Call your doctor immediately if your device beeps.

CRT-P and CRT-D Implant Risks

While complications don't happen very often, it's important to know that there are risks associated with the implantation of any device or lead. You should talk with your doctor about these risks, including the ones below.

Some of the risks encountered during the implant procedure include, but are not limited to, the following:

- Bleeding
- Formation of a blood clot
- Damage to adjacent structures (tendons, muscles, nerves)
- Puncture of a lung or vein
- Damage to the heart (perforation or tissue damage)
- Dangerous arrhythmias

- Heart attack
- Stroke
- Death

Some of the risks encountered after the system is implanted may include, but are not limited to, the following:

- You may develop an infection
- You may experience erosion of the skin near your device
- The device may move from the original implant site
- The lead(s) may move out of place in the heart
- The electrodes on the lead or the pacing pulses may cause an irritation or damaging effect on the surrounding tissues, including heart tissue and nerves
- You may have difficulty coping with having an implanted device
- The device might be prevented from shocking or pacing due to electromagnetic interference
- You may receive a shock or pacing therapy when it is not needed
- The device might not be able to detect or appropriately treat your heart rhythms
- The device may exhibit malfunctions that may result in lost or compromised ability to deliver therapy

Be sure to talk with your doctor so that you thoroughly understand all the risks and benefits associated with the implantation of a CRT system.