



# LIVING WITH YOUR HEART FAILURE DEVICE (CRT)\*

\* Cardiac Resynchronization Therapy (CRT)

**Medtronic**

# TOGETHER, HELPING YOU LEAD A FULLER LIFE.

If you or someone you love has been diagnosed with heart failure, this booklet can help you understand your heart condition and treatment options. It is designed to provide you with basic information about heart failure and cardiac resynchronization therapy (CRT) devices, including what to expect before and after you have a CRT device implanted.

Ask your doctor about your unique medical condition and therapy management.



**Angelina**  
CRT-D Recipient

## WHAT IS HEART FAILURE?

Heart failure is a condition where the heart muscle is weakened and is not able to efficiently pump blood.

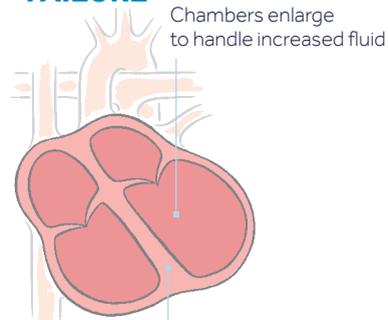
The term *heart failure* does not mean your heart has stopped pumping; rather, your heart muscle is not able to pump enough blood to meet your body's needs. As a result, you may feel tired, lack energy, experience shortness of breath and notice excess fluid collecting in your body.

The heart is a fist-sized organ that acts as a pump to send oxygen-rich blood throughout the body. In a healthy heart, each chamber contracts (squeezes) in a coordinated effort—the upper chambers (atria) of the heart contract first, then the lower chambers (ventricles) contract. These coordinated contractions circulate blood between the lungs and heart and to the rest of the body. If the heart is not beating in a coordinated fashion, then the body will not receive an adequate amount of blood to function properly.

### HEALTHY HEART



### HEART FAILURE



Walls may thicken to handle the increased strain

During heart failure, the heart attempts to compensate for lost pumping power, which may change its shape and result in an uncoordinated (or unsynchronized) and inefficient heartbeat.

# SYMPTOMS OF HEART FAILURE

Heart failure is a progressive condition, meaning it will gradually worsen. At first you might not experience any symptoms, but over time your heart's pumping ability will continue to weaken and you may experience some or all of the following symptoms:

- Chronic lack of energy
- Difficulty sleeping at night due to breathing problems
- Confusion and/or impaired memory
- Increased urination at night
- Swelling of feet and legs
- Shortness of breath
- Swollen or tender abdomen with loss of appetite
- Cough with frothy sputum

# CAUSES OF HEART FAILURE

Heart failure usually develops slowly after an injury to the heart. There is no single cause, and sometimes the cause is unknown. Some of the most common causes of heart failure are:

- Previous heart attack (myocardial infarction)
- Coronary artery disease
- High blood pressure (hypertension)
- Heart valve disease
- Infection of the heart (myocarditis)
- Congenital heart disease (condition you were born with)
- Endocarditis (infection of the heart's inner lining)
- Diabetes (the body does not produce or properly use insulin)

# RISKS OF A POORLY PUMPING HEART

A weakened heart muscle must work harder to pump blood to the body. This may cause the heart to beat faster, which can lead to dangerously fast or irregular heart rhythms. These abnormal heart rhythms can lead to a condition called Sudden Cardiac Arrest (SCA).

## What is SCA?

SCA typically occurs when an electrical problem with the heart triggers a dangerously fast heart rhythm that causes the heart to quiver rather than contract or pump. When the heart stops pumping blood, oxygen cannot reach the body and brain. If not treated immediately, SCA can be fatal. The most effective way to treat SCA is through defibrillation.<sup>1</sup> Defibrillation involves delivering an electrical shock to your heart to restore a normal heartbeat. To survive an SCA event, you must receive defibrillation within ten minutes.<sup>2</sup> Only about 5% of people survive SCA, because defibrillation was not delivered within this critical time frame.<sup>2</sup>

## Who is at risk of sudden cardiac arrest?

Generally, sudden cardiac arrest strikes without warning. People who are at a higher risk for SCA include<sup>2</sup>:

- Those who have had a heart attack
- Heart failure patients
- Survivors of a previous SCA or those who have a family member who has had an SCA event
- People with a low ejection fraction

## EF number: a number you should know

EF stands for “ejection fraction.” It is the percentage of blood that is pumped out of the heart with each heartbeat. Your doctor determines how well your heart is pumping based on your EF number.

Your EF number can change over time. It is important for you and your doctor to check your EF regularly.

## Chart of typical EF ranges<sup>2</sup>:

<b>50–75%</b> Heart's pumping ability is <b>NORMAL</b>	<b>36–49%</b> Heart's pumping ability is <b>BELOW NORMAL</b>	<b>35% &amp; Below</b> Heart's pumping ability is <b>LOW</b>
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People with a low EF—35% or below—are at an increased risk for SCA.<sup>3</sup>

A healthy heart has an EF between 50% and 75%. This indicates the heart is pumping well and able to deliver enough blood to the body and brain. Even a healthy heart does not pump 100% of blood out of the heart during each beat—some blood always remains in the heart.

## How is EF measured?

The most common way to measure EF is with an echocardiogram. This test is usually performed in a doctor's office or hospital's diagnostic area.

## Treating heart failure

Heart failure is a progressive condition. Your doctor may prescribe a variety of treatment options that may slow the progression of the disease, strengthen your heart and improve your quality of life. Some of these treatments may include medications, lifestyle changes, exercise, device therapy or a combination of these. Only your doctor can determine which option is right for you.

# WHAT IS A CARDIAC RESYNCHRONIZATION THERAPY DEVICE?

When people refer to an implantable cardiac resynchronization therapy (CRT) device, they are actually discussing the system—the CRT device and the leads.

- A **CRT device** is a device implanted under the skin, typically just below the collarbone. The device delivers therapies to coordinate the heart's pumping action and treats fast, irregular or slow heart rhythms depending on the type of CRT device. This device may also be referred to as a heart failure device, biventricular device, three-lead CRT device, CRT-P (pacemaker) or a CRT-D (defibrillator).
- **Leads** are thin, soft insulated wires about the size of a spaghetti noodle. The leads carry the electrical impulse from the CRT device to your heart and relay information about the heart's activity back to the CRT device.

# HOW DOES A CARDIAC RESYNCHRONIZATION THERAPY DEVICE WORK?

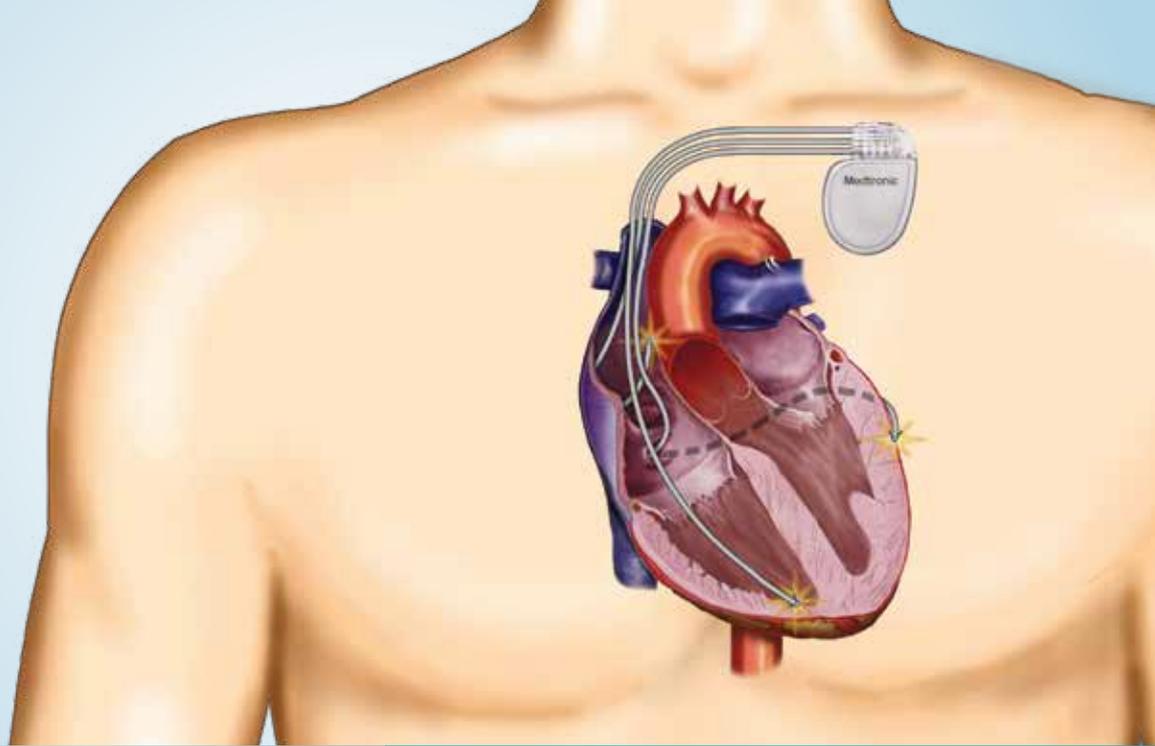
A cardiac resynchronization therapy device is designed to monitor your heart rhythm 24 hours a day. It sends electrical pulses to pace the lower chambers of your heart to help them beat in a more coordinated rhythm. This coordinating or "resynchronization" therapy improves the heart's ability to pump blood and oxygen more efficiently to the body. Your doctor will program the CRT device to deliver the most effective therapies for your specific heart condition.

## In response to abnormal heart rhythms, a CRT heart device may also provide the following therapies:

- Pacing therapy for slow heart rhythms—electrical impulses are delivered to the heart when the heart's own rhythm is too slow or irregular
- Defibrillation therapies for fast or irregular heart rhythms—a shock therapy is delivered to the heart to interrupt fast heart rhythms and restore a normal heart rate

There are two types of CRT devices—a CRT pacemaker (CRT-P) and a CRT defibrillator (CRT-D). CRT-D devices, like all defibrillators, have a pacemaker function in them. Both devices help to coordinate the heart's pumping action and deliver pacing therapy for a slow heart rate. However, the CRT-D can also treat fast heart rhythms.

All cardiac resynchronization devices are designed to use three leads. One lead is placed inside the right atrium, another lead is placed inside the right ventricle and the third lead is placed inside a vein on the outside of the left ventricle.



Cardiac Resynchronization Therapy  
Defibrillator (CRT-D) and Leads  
(actual size)



Cardiac Resynchronization Therapy  
Pacing (CRT-P) and Leads  
(actual size)



# GETTING A CRT DEVICE IMPLANTED

# MRI SCAN ACCESS

The procedure to implant a CRT device does not require open heart surgery, and most people go home within 24 hours. Before the surgery, medication may be given to make you sleepy and comfortable. Generally, the procedure is performed under local anesthesia.

## The general steps of an implant procedure include:

- A small incision, approximately two to four inches long, will be made in the upper chest area, just below your collarbone
- Three leads will be guided through a vein into your heart, and the leads will be connected to the CRT device
- The CRT device settings will be programmed, and the device will be tested to ensure it is working properly to meet your medical needs
- The CRT device will be inserted beneath your skin, and the incision in your chest will be closed

Traditionally, most CRTs are not considered safe in an MRI environment because the MRI could change the settings, temporarily affect the normal operation of or potentially damage the CRT.

Take comfort in knowing that Medtronic has CRT-D systems that are FDA approved for use in the MRI environment. The CRT-D system has a unique design developed so that under specific conditions, patients may safely undergo MRI scans. Talk to your doctor about the CRT-D options available to you, including a device that may allow you access to an MRI in the future.



# FOLLOW-UP CARE & REMOTE MONITORING

Follow-up appointments enable the CRT to be thoroughly checked. During these check-ups, your doctor may:

- Monitor the battery status of the CRT
- Check the leads to determine how they are working with the CRT and your heart
- Review your CRT settings to ensure they are programmed appropriately to your medical needs
- Make programming adjustments to your CRT

In addition to these check-ups with your doctor, your clinic or practice may choose to have your CRT checked through remote monitoring.

Today millions of people all over the world benefit from remote monitoring of their heart devices. Remote monitoring of your Medtronic heart device allows you to send device information to your doctor or clinic through a small monitor. Your clinic can review this information on the secure CareLink™ Network and take appropriate action.

Medtronic patient monitors are easy to use and offer convenient connection options—Wi-Fi, Internet connection or cellular signal—depending on your specific monitor.

**To find out if remote monitoring is right for you, please talk to your doctor.**

## PATIENT TESTIMONIALS



*“With remote monitoring, you’re more connected with your clinic. It’s easy. It’s reliable. It’s just a great tool and a great asset to your medical care—and making sure you’re connected with your doctor.”*

**Robbie**  
(Cardiac Device Patient)



*“Why wouldn’t you do something like this (remote monitoring)? It’s convenient. It’s accurate. It’s not intrusive.”*

**Doug**  
(Cardiac Device Patient)

# LIVING WITH A CRT DEVICE

Many people with a CRT device resume their normal daily activities after recovering from the implant procedure. There may be certain situations your doctor will ask you to avoid. Discuss your activity and lifestyle goals with your doctor and develop a plan that works best for you.

## FREQUENTLY ASKED QUESTIONS

### Can I use a cell phone?

Yes. When talking on a cell phone keep the phone's antenna six inches away from your CRT device, and use the phone on the ear opposite your CRT device. We also recommend you avoid placing the cell phone in a pocket near your CRT device.

### Are household appliances safe to use?

Yes. Most household appliances are safe to use as long as they are properly maintained and in good working order. This includes microwave ovens, major appliances, electric blankets and heating pads.

### Will magnets affect my device?

Items that contain magnets, such as magnetic therapy products, stereo speakers and hand-

held massagers can temporarily affect the operation of your CRT device. Therefore, it is recommended you keep items containing magnets at least six inches away from your implanted CRT device. We do not recommend the use of magnetic mattress pads and pillows because it is difficult to maintain a six-inch distance when using these items.

### Will I be able to travel?

Given the short duration of security screening, it is unlikely that your Medtronic CRT device will be affected by metal detectors (walk-through archways and hand-held wands) or full body imaging scanners (also called millimeter wave scanners and 3D imaging scanners) such as those found in airports, courthouses and jails.

To minimize the risk of temporary interference with your CRT device while going through the security screening process, avoid touching metal surfaces around any screening equipment. Do not stop or linger in a walk-through archway; simply walk through the archway at a normal pace. If a hand-held wand is used, ask the security operator not to hold it over your CRT device and not to wave it back and forth over your CRT device. You may also request a hand search as an alternative.

If you have concerns about these security screening methods, show your device ID card, request alternative screening and then follow the instructions of the security personnel.

# EDUCATIONAL SERVICES FOR PATIENTS

## Medtronic Patient Services

If you have a Medtronic cardiac device and want to learn more or have questions about living with an implanted CRT device, please contact Medtronic Patient Services at 1 (800) 551-5544, ext. 41835. Our Patient Services Specialists are available to assist you, Monday-Friday from 8 a.m. to 5 p.m. Central time.

## Medtronic.com

The Medtronic website includes in-depth information on heart conditions and treatment options for patients and their caregivers. Our interactive website allows you to take assessments, view video, read patient stories and link to other resources. Visit us online at [www.medtronic.com](http://www.medtronic.com).

## References

- <sup>1</sup> Zipes DP, Roberts D. Results of the international study of the implantable pacemaker cardioverter-defibrillator. A comparison of epicardial and endocardial lead systems. The Pacemaker-Cardioverter-Defibrillator Investigators. *Circulation*. July 1, 1995;92(1):59-65.
- <sup>2</sup> American Heart Association. Statistical fact sheet. Sudden death from cardiac arrest. [www.americanheart.org](http://www.americanheart.org).
- <sup>3</sup> Epstein AE, DiMarco JP, Ellenbogen KA, et al. ACC/AHA/HRS 2008 Guidelines for device-based therapy of cardiac rhythm abnormalities [corrections appear at *J Am Coll Cardiol*. April 21, 2009;53(16):1473. *J Am Coll Cardiol*. January 6, 2009; 53(1):147.]. *J Am Coll Cardiol*. May 27, 2008;51(21):e1-62.

## Brief Statement

### Additional Device Information

A cardiac resynchronization therapy (CRT) implantable cardioverter defibrillator (ICD) system delivers therapies to treat patients who may benefit from synchronizing the pumping of the heart chambers. A CRT ICD also delivers therapies to treat patients with heart rhythm disorders or who are at significant risk of developing heart rhythm disorders. A CRT ICD is placed inside your body and works automatically.

An implantable CRT pacemaker system relieves symptoms of heart rhythm disturbances. They do this by restoring normal heart rates. A normal heart rate provides your body with the proper amount of blood circulation. The pacemaker system is intended for patients who need rate-adaptive pacing or chronic pacing or for patients who may benefit from synchronizing the pumping of the heart chambers.

Risks associated with these implantable device systems include, but are not limited to, infection at the surgical site and/or sensitivity to the device material, failure to deliver therapy when it is needed, or receiving extra therapy when it is not needed. After receiving a CRT ICD system, you will have limitations with magnetic and electromagnetic radiation, electric or gas-powered appliances, and tools with which you are allowed to be in contact.

Treatment with these implantable device systems is prescribed by your physician. This treatment is not for everyone. Please talk to your doctor to see if it is right for you. Your physician should discuss all potential benefits and risks with you. Although many patients benefit from the use of this treatment, results may vary. For further information, please call the Medtronic toll-free number at 1 (800) 551-5544 (8:00 a.m. to 5:00 p.m., Monday-Friday, Central time) or see the Medtronic website at [www.medtronic.com](http://www.medtronic.com).

## Medtronic CareLink™ Monitor/CareLink™ Network

### Additional Device Information

The CareLink Monitor is a prescription product indicated for use in the transfer of patient data from some Medtronic implantable cardiac devices based on physician instructions and as described in the product manual. This product is not a substitute for appropriate medical attention in the event of an emergency and should only be used as directed by a physician. CareLink Service is currently available in the continental United States, Alaska, and Hawaii.

The CareLink Service is prescribed by your physician. This service is not for everyone. Please talk to your doctor to see if it is right for you. Your physician should discuss all potential benefits and risks with you. Although many patients benefit from the use of this service, results may vary. For further information, please call the Medtronic toll-free number at 1 (800) 551-5544 (Monday-Friday, 8:00 a.m. to 5:00 p.m., Central time) or see the Medtronic website at [www.medtronic.com](http://www.medtronic.com).

**Caution:** Federal law (USA) restricts these devices to sale by or on the order of a physician.

# Medtronic

## Patient Services

Medtronic  
8200 Coral Sea St. NE MVS14  
Mounds View, MN 55112  
Patient toll-free line:  
1 (800) 551-5544  
Fax: (763) 367-5809  
8:00 am to 5:00 pm CT Mon.-Fri.

Medtronic  
710 Medtronic Parkway  
Minneapolis, MN 55432-5604  
USA  
Tel: (763) 514-4000  
Fax: (763) 514-4879

Toll-free: 1 (800) 328-2518  
(24-hour technical support for  
physicians and medical professionals)

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