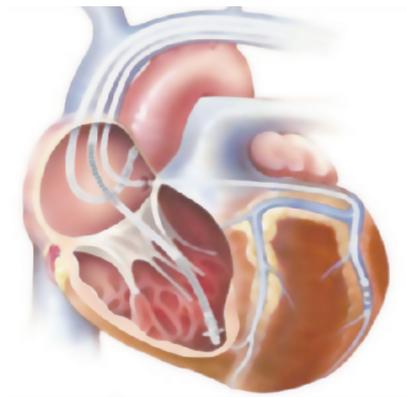


# Cardiac Resynchronization Therapy (CRT)

Millions of people worldwide suffer from congestive heart failure (CHF), a serious and common problem that is often due to weak pumping of the heart muscle.



Poor heart pumping function can cause fatigue, leg swelling, trouble exercising, and difficulty breathing. Lifestyle changes, medicines, and heart surgery can sometimes help with symptoms, but because many people with CHF also have an arrhythmia, or heart rhythm problem, they need even more help to keep their hearts functioning properly.

## What is CRT?

Cardiac resynchronization therapy (CRT) can improve CHF symptoms by improving the timing of the heart's contractions, resulting in a more powerful heartbeat, pumping more blood to the body.

CRT uses a biventricular pacemaker (or defibrillator) with two wires in the lower chambers of the heart to overcome this abnormal conduction. By delivering simultaneous or near simultaneous electrical impulses to both lower heart chambers (the right and left ventricles), it causes the heart to beat in a more synchronized, efficient manner. Biventricular pacing improves the symptoms of about two-thirds of patients undergoing this procedure and also improves survival.

Because people with heart muscle damage are at risk for dangerously fast heart rhythms, biventricular pacing is often combined with a defibrillator.

The procedure to put in a resynchronization device is a little more complicated than putting in a regular pacemaker or defibrillator. The extra or third wire required is usually positioned in a very small vein that goes to the left side of the heart. Although most people have a vein that can be used for this purpose, this is not true of everyone. Therefore, this extra wire is occasionally placed on the outside of the heart during a surgical procedure or at the time of another heart operation, such as valve surgery or coronary bypass operation.

Biventricular pacing improves the symptoms of about  $\frac{2}{3}$  of patients undergoing this procedure and also improves survival.

Like all pacemakers and defibrillators, biventricular devices require monitoring to be certain that they are functioning in the best possible way. Their batteries also gradually wear down, and they need to be changed every 5-7 years. Changing the batteries in a biventricular device is generally a simple operation.

### When is CRT the Right Choice?

**The ideal candidate for a CRT device is someone with:**

- **Moderate to severe CHF symptoms, despite lifestyle changes and medication**
- **A weakened and enlarged heart muscle**
- **A significant electrical delay in the lower pumping chambers (bundle branch block)**

**Some CRT candidates also have a high risk of Sudden Cardiac Death. For these patients, a special CRT device can stop potentially life-threatening rapid heartbeats by delivering an electrical shock known as defibrillation. This device incorporates a standard implantable cardioverter defibrillator (ICD) with a CRT pacemaker creating a “CRTD” device. (The “D” refers to defibrillation.)**