

HEALTHY HEART

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Cardiac Resynchronization Therapy (CRT) for Heart Failure

Heart Failure

Heart failure is 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 and breathing difficulty. Lifestyle changes and medicines can help with symptoms, but because many people with heart failure also have heart rhythm problem and electrical disturbance, they need even more help to keep their heart functioning properly.

Electrical disturbance in Heart failure Normal electrical activity is very important for normal function of the heart. Electric current spreads throughout the heart using special electrical connections within the heart. Patients may have defective electrical connections due to enlargement of heart in heart failure. Defective electric connections (LBBB) lead to blockage in electric current, which can cause worsening of heart failure symptoms.

What is CRT?

CRT (Cardiac resynchronization therapy) means correction of electrical disturbance in heart failure patients. Electrical disturbance occurs due to blockage in natural electric current of the heart.

CRT can improve heart failure symptoms by improving electric current and pumping of heart muscles.

CRT uses a biventricular pacemaker (with or without defibrillator) with two wires in the lower chambers of the heart to improve electrical activity. By delivering simultaneous electrical impulses to both lower heart chambers (right ventricle and left ventricles), it causes the heart to beat in a more synchronized and 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 of dangerously

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fast heart rhythms, biventricular pacing is often combined with a defibrillator.

CRT device implantation is a little more complicated than putting in a regular pacemaker or defibrillator. The extra third wire is usually positioned in a very small vein that goes to the left side of the heart. Most people (80-90%) have a vein that can be used for this purpose, but in some cases this extra wire is placed on the outside of the heart by a surgical procedure.

Components of CRT system (Combo therapy)

1. Pulse generator (device): It is a small metal box containing computer system with circuits and battery.
2. Leads: Leads are special wires which connect pulse generator with heart muscles. Electric current from pulse generator reaches to the heart muscles through these special wires. CRT will have total 3 leads (wires).

Types of CRT devices (Combo therapy)

1. Biventricular Pacemaker without ICD (CRT-P): It has three wires, one in the right atrium, one in the right ventricle and a third in the left ventricle. These are more complicated pacemakers and take more time to implant, and it is used to improve pumping in patients with heart failure. It can not normalize dangerous rapid heart rhythms.
2. Biventricular Pacemaker with ICD (CRT-D): It has three wires, one in the right atrium, one in the right ventricle and a third in the left ventricle. These are more complicated devices and take more time to implant, and it is used to improve pumping in patients with heart failure and it can also normalize dangerous rapid heart rhythms.

When are CRT devices Used?

1. Heart failure: Enlargement of heart with reduced pumping can lead to heart failure. Heart failure patients can have problem with electrical system (LBBB) which can aggravate heart failure symptoms. A special pacemaker can be programmed to improve electrical system of heart which can increase the force of heart muscle contractions. This is called "biventricular pacing" or "resynchronization" therapy (CRT).
2. Heart failure patients who are at high risk of Sudden Cardiac Death (SCD): In this type of patients CRT-D device can stop potentially life threatening dangerous rapid heartbeats by delivering an electric shock.

What are the benefits of having a CRT?

By delivering simultaneous electrical impulses to both lower heart chambers (right ventricle and left ventricles), it causes the heart to beat in a more synchronized and efficient

manner. Biventricular pacing improves the symptoms of about two-thirds of patients undergoing this procedure and also improves survival. CRT-D device can also stop potentially life threatening dangerous rapid heartbeats by delivering an electric shock. CRT can help people to enjoy longer, more productive, happier and healthier lives.

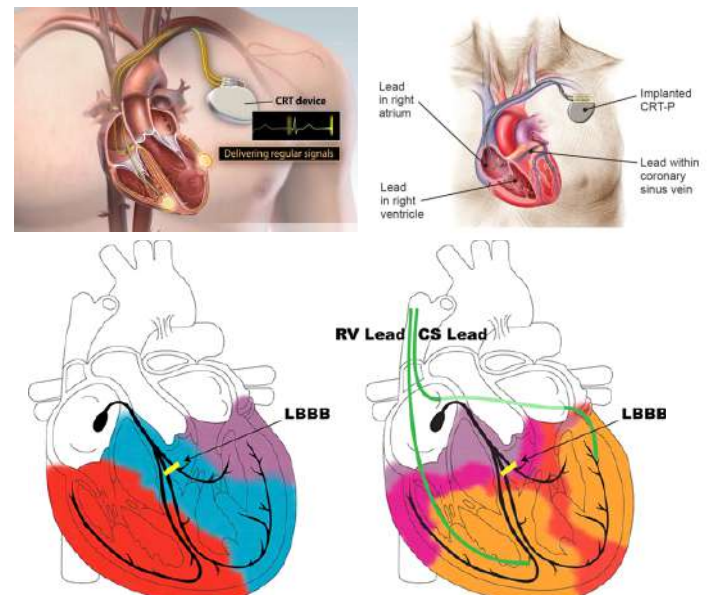
What about MRI after CRT?

An MRI (Magnetic Resonance Imaging) scanner is a large machine which generates very strong magnetic forces that can be very dangerous to almost all metallic implanted devices, like your CRT device. The magnetic fields can interfere with the tiny computer in your CRT and can heat the tips of leads in your heart to dangerous levels.

However, currently used CRTs are having MR Conditional system. This system has been specially designed to withstand the forces of most MRI scanners. If you have this MR Conditional system implanted, then you can have an MRI scan under certain circumstances.

What is Pacemaker clinic and why should I attend it regularly?

Pacemaker clinic is a special OPD having facility to check CRT patients. Your CRT device should be checked regularly and you will be advised to attend pacemaker clinic as required. You will be seen at least twice a year and may be asked to attend more often if necessary. During each clinic visit, the specialist will examine your CRT using a special programmer. This machine will allow them to examine the settings and the battery life of your device. Special measurements are also done to assess the function of the leads that connect the CRT device to your heart.





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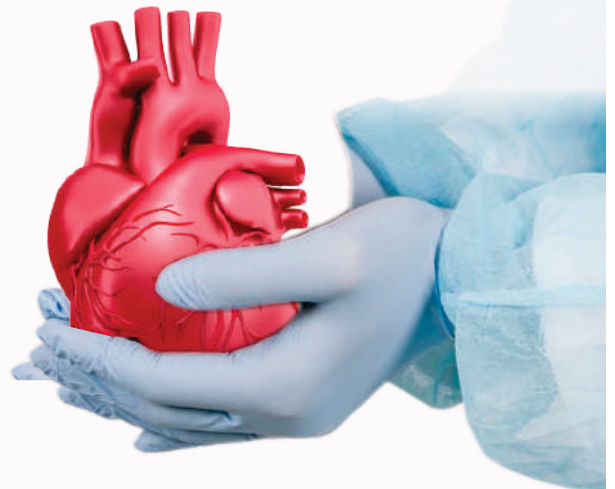
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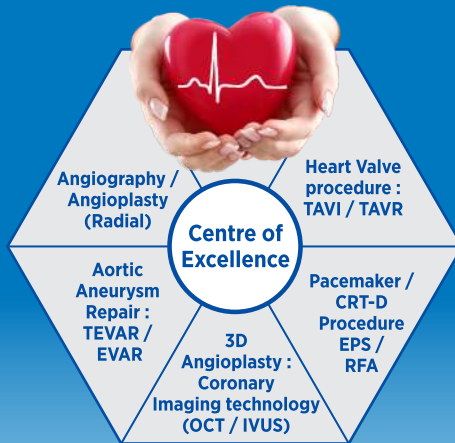


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