

# HEART FAILURE : NEWER TREATMENTS NEW HOPE - AIMING FOR CURE

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## What is heart failure ?

Heart failure is a condition or a collection of symptoms in which the heart is not pumping enough blood to meet the body's needs.

## Scope of Problem

Heart failure is very common. Heart failure affects millions of patients in India. About half of people who develop heart failure die within 5 years of diagnosis. Not only is heart failure a major problem affecting many people, heart failure is also a major killer. Heart failure directly accounts for about 8.5% of all heart disease deaths. And, by some estimates heart failure actually contributes to about 36% of all cardiovascular disease deaths. One study notes that heart failure is mentioned in one in eight death certificates. Hospitalisations for heart failure are a huge burden on our health-care system. But with newer advances in therapy the trend may change and we are heading towards major cure.

## Early recognition Important : Lost Time is never found Again

### Signs and Symptoms of Heart Failure

Common symptoms include:

- Shortness of breath during daily activities.
- Having trouble breathing when lying down.
- Weight gain with swelling in the feet, legs, ankles, or stomach.
- Generally feeling tired or weak

## BUT HEART FAILURE IS TREATABLE AND RECOVERY POSSIBLE

Your electrophysiologist / heart failure specialist will determine the cause of heart failure and if there is a reversible cause heart failure may improve by its correction. You will be started on appropriate medicines as per suitability and tolerability.

**Device Therapy For Heart Failure:** Newer devices have revolutionised the way we treat heart failure patients and help recovery.

### Understanding Pacemaker & devices

A pacemaker is designed to mimic the heart's natural pacemaker, the sinus node. The pacemaker has two main purposes :

- 1 Pacing: A pacemaker will send an electrical impulse to the heart through a pacing lead when the heart's own rhythm is too slow or interrupted. This electrical impulse starts a heartbeat.
- 2 Sensing: A pacemaker will also "sense" (monitor) the heart's natural electrical activity. When the pacemaker senses a natural heartbeat, it will not deliver a pacing pulse.

Traditional cardiac pacemaker systems generally include a subcutaneous pulse generator placed in the chest wall and transvenous pacing leads affixed to myocardial tissue.

Depending on your heart condition, your doctor will prescribe either a single- or dual-chamber pacemaker. This refers to the number of heart chambers that need to be paced or sensed.

For single-chamber pacing, either the right atrium (upper chamber) or the right ventricle (lower chamber) is paced. Only one pacing lead is used.

For dual-chamber pacing, both the right atrium and right ventricle are paced by two pacing leads.



Cardiac Devices like defibrillator or cardiac resynchronisation therapy are pacemaker like devices with additional special functions.

**PROCEDURE :** The procedure is performed under local anesthesia. A small incision, approximately 2 inches long will be made in the upper chest. One or two leads (thin insulated wires) will be guided through the vein into the heart. The electrophysiologist will then connect the lead(s) to your pacemaker / device and program it as per your medical needs.

The pacemaker / device is inserted beneath your skin, and the incision in your chest will be closed.



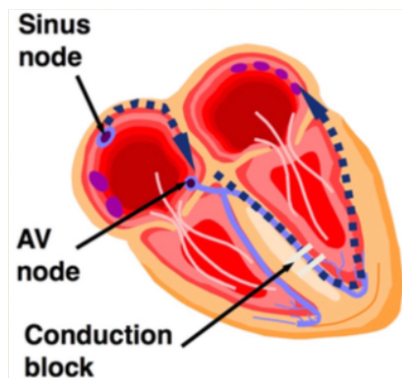
### **Cardiac Contractility Modulation :**

Cardiac contractility modulation is a therapy which is intended for the treatment of patients with moderate to severe heart failure with symptoms despite optimal medical

therapy who can benefit from an improvement in cardiac output. The short- and long-term use of this therapy enhances the strength of ventricular contraction and therefore the heart's pumping capacity by adjusting the myocardial contractility.

### Cardiac Resynchronization Therapy (CRT)

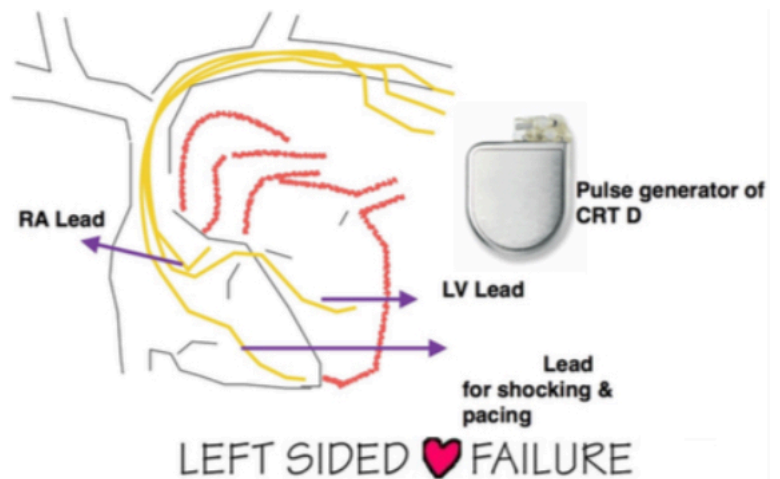
In a subset of heart failure patient with certain conduction abnormality known as left bundle branch block (LBBB) detected on ECG the lower chambers of heart may not pump blood in a synchronise manner resulting in decreased cardiac output and a device known to provide cardiac re-



diac re-synchronisation is used known as CRT.

CRT device

sends small, undetectable electrical impulses to both lower chambers of the heart to help them beat together in a more synchronised pattern. This improves the heart's ability to pump blood and oxygen to the body.



### LEFT SIDED HEART FAILURE

- Paroxysmal Nocturnal Dyspnea
- Elevated Pulmonary Capillary Wedge Pressure
- Pulmonary Congestion
  - Cough
  - Crackles
  - Wheezes
  - Blood-Tinged Sputum
  - Tachypnea
- Restlessness
- Confusion
- Orthopnea
- Tachycardia
- Exertional Dyspnea
- Fatigue
- Cyanosis



**CRT-D** : in addition to improving pumping function provides additional defibrillation capability which is mostly required in weak hearts. Abnormal fast heart beating ( ventricular tachycardia & fibrillation ) are most common cause of sudden death in heart failure patients. During an abnormal rhythm the heart may not be able to pump enough blood to the body.

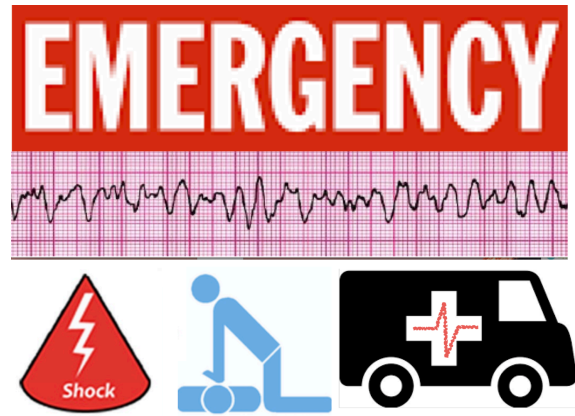
It describes the amount of blood that is getting pumped out.

What does "Ejection Fraction" mean?

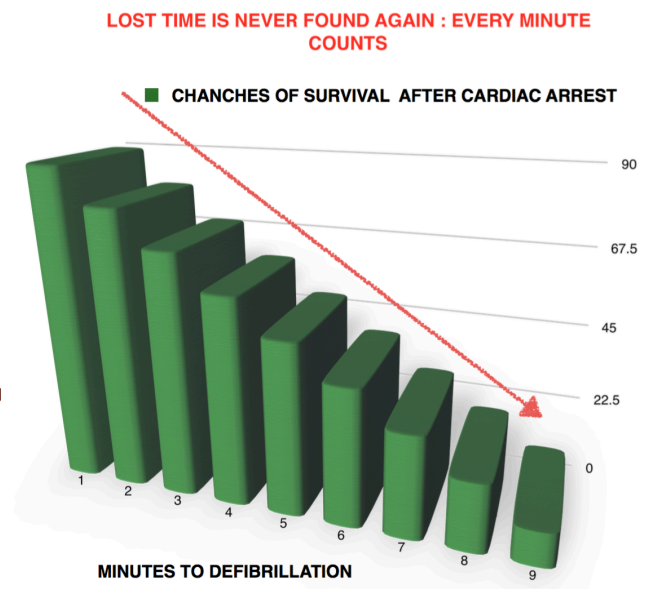
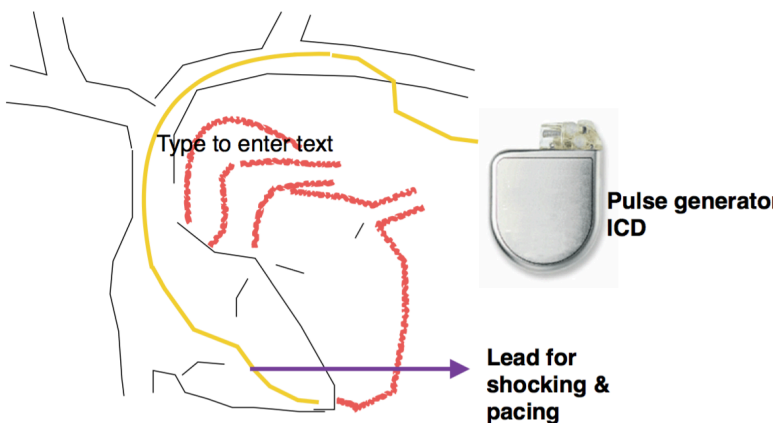
A "reduced ejection fraction" may lead to symptoms like increased fatigue.

**Sudden cardiac arrest** - sudden

death of apparently normal patient is leading cause of death in heart failure patients and worldwide. This is mostly due to abnormal very fast heart beating in lower chamber of heart and requires immediate electric shock to correct . The success of electric shock decreases exponentially with time and delayed after 10 minutes practically no one survives. The ICD helps by timely delivering electric therapy to restore normal rhythm.



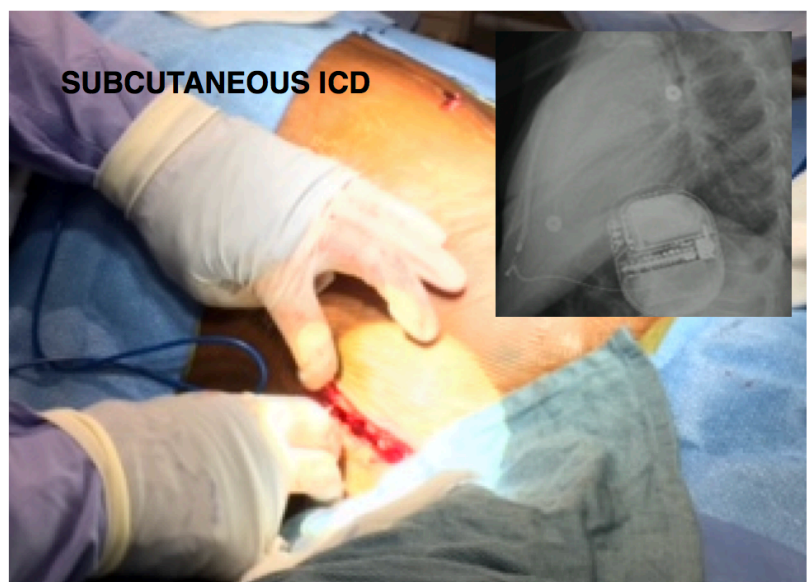
**Implantable cardioverter defibrillator (ICD)** is a device implantable inside the body, able to perform cardioversion, defibrillation, and pacing of



the heart.

It is inserted like a pacemaker under local anaesthesia and placed under the skin and having a transvenous lead that goes to heart .It can perform defibrillation in addition to pacing.It is recommended for those with ventricular tachycardia or ventricular fibrillation or those having risk of sudden death.

For patients not having



patients veins to implant leads subcutaneous ICD is an option.

Similarly for patients not having patent veins or very elderly , high risk or having atrial fibrillation if they require pacing leadless pacemaker with size of less than a rupee coin can be implanted.

## Follow up

It is important that the patient's pacemaker/device be checked regularly (one month after implant and every six months thereafter). Your electrophysiologist monitors the

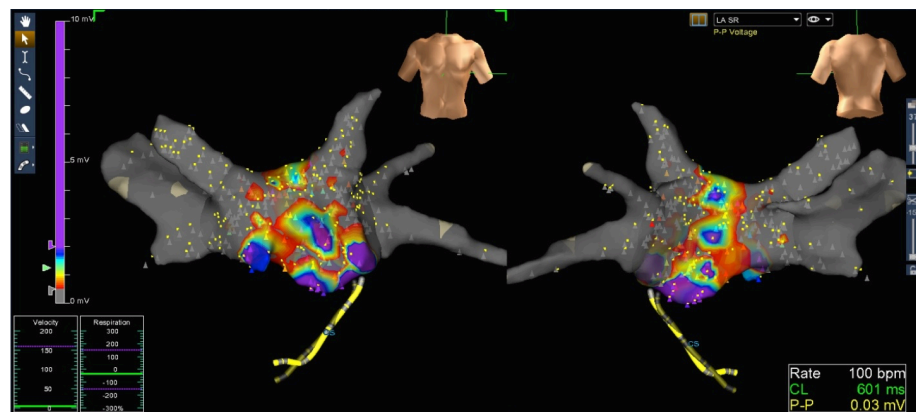


battery status , pacing and sensing parameters of the device and also your device works as a continuous spy on your heart and your doctor can get information about arrhythmia, your activity and numerous important parameters pertaining to your heart function.

## Heart Failure due to arrhythmias

Arrhythmia are abnormal heart rhythms. For adequate blood pumping heart needs synchronised electric impulse to start at pacemaker cells of heart and travel via conduction system( electric wires or nerves ) to various parts of heart.

Atrial Fibrillation (AF) is the most common arrhythmia and responsible for heart failure. These arrhythmia related heart failure are completely reversible by control of arrhythmias by drugs



or minimally invasive ablation therapy which uses special tubes (catheters) with small electrodes. After administration of a local anaesthetic to numb the skin over blood vessels (usually in the groin), the catheters are inserted into the blood vessel and guided to the heart. There, they are used to cauterise (burn) or freeze heart cells to modify or destroy the abnormal electrical circuits and triggers causing AF or other arrhythmias , thereby preventing them.

**Education is greatest weapon for change .** The purpose of this article is public awareness & education & reverse dismal mortality statistics in India.

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Post Doctoral Fellowship – Electrophysiology & Device

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Founder India's First Arrhythmia Support Network

First Atrial Fibrillation & Sudden cardiac arrest Support Network

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