



## Procedure Information Sheet

### Introduction

Heart failure patients have symptoms of shortness of breath and body swelling caused by decreased pumping of blood from the heart. Initial management includes treating underlying cause, adopting a healthy lifestyle and taking medications. Patients with persistent symptoms despite the above treatments and a high risk of developing life-threatening arrhythmias such as ventricular tachycardia (VT) and ventricular fibrillation (VF) may consider implantation of a Cardiac Resynchronization Therapy Defibrillator (CRT-D) - Cardiac Resynchronization Therapy device with a back up defibrillation function. It is essentially an implantable cardiac pacemaker which consists of a battery-powered generator and leads which connect the generator to the patient's heart. But there is a special lead placed in the left heart, so that the device can stimulate both the left and right heart in a coordinated (synchronized) manner. The synchronized contraction will increase pumping of blood from the heart. Moreover, the lead placed in the right heart has defibrillation function. As soon as a VT or VF is detected, the CRT-D will automatically try to correct it by anti-tachycardia pacing, cardioversion or defibrillation.

Recent studies have shown that in selected groups of patients, CRT-D improves heart failure symptoms, quality of life, exercise capacity and heart function and reduce the death rate from the disease. If patient refuses this procedure, heart failure symptoms may be persistent or worsened and the result may be detrimental or even fatal especially when VT or VF occurs.

### Indication

Management of heart failure, improve the function of pumping of blood from the heart.

### The Operation / Procedure

1. This invasive procedure is performed under local anesthesia in a cardiac catheterization centre. Patient is alert during the procedure, but sedation may be given for calm down purpose.
2. Electrodes are adhered to the chest to monitor the heart rate and rhythm. Blood oxygen monitor through finger tip will be set up. Measurement of blood pressure from the arm will be taken during the examination.
3. Skin disinfection will be performed and a small skin incision (about 3-5 cm long) will be made under the left (sometimes right) clavicle.
4. Contrast may be injected intravenously to visualize the veins in the arm and needle puncture under the clavicle may be required to obtain access to the vein.
5. 3 leads will be advanced to the heart chambers through the vein under X-ray guidance. One lead is placed in the right atrium and one in the right ventricle. A special lead is implanted in a vein called the coronary sinus which lies on the surface of the left ventricle. Contrast injection is required to show this vein.
6. The generator will be connected with the lead(s) and implanted in a pocket created under the skin or muscle.
7. The wound will be closed with suturing material and covered with pressure dressing.
8. The procedure usually takes around 3-4 hours.

### Before the Operation / Procedure

1. Preliminary investigations including blood tests, chest X-ray, electrocardiogram and echocardiogram of the heart will be performed.
2. Patient needs to sign an informed consent.
3. Blood thinning drugs or Metformin (for diabetes) may have to be stopped several days before the procedure. Steroid will be given if contrast injection is necessary and there is history of allergy.
4. Shaving and disinfection near the implant site may be required.
5. An IV infusion will be set up and fasting for 4-6 hours is needed.
6. If patient is a female, please provide the last menstrual period (LMP) and avoid pregnancy before the procedure as this procedure involves exposure to radiation.

<b>Patient's Label</b>
Patient Name: _____
Hospital No: _____
Episode No: _____



## After the Operation / Procedure

1. After the procedure, patient will be kept on close monitoring in the ward.
2. Nursing staff will check pulse and wound regularly.
3. Patient should inform nurse if blood oozing from the wound site is found.
4. Patient may resume oral diet as instructed.
5. Mild wound pain is common. Patient may take simple analgesic to relieve pain.
6. Antibiotics will be given for a few days to minimize the risk of wound infection.
7. Patient may be discharged from hospital several days after the CRT-D implantation.
8. Before discharge, CRT-D testing and programming will be performed and VF may be induced.
9. The wound should be covered with light dressing. Please keep the wound site clean and avoid making the dressing wet during a bath. Always change dressing if wet.
10. Patient will need to come back to clinic for wound inspection one week after procedure or according to Doctor's order.
11. Please avoid lifting the affected arm for 1 week, and avoid vigorous arm movement in the first month after the procedure.
12. Patient should have regular follow up for CRT-D analysis, re-programming and battery power assessment. To maximize the benefits of CRT, the settings will be optimized with the help of echocardiogram.
13. Please carry the CRT-D identity card at all times.
14. Follow Doctor's instructions or refer to the information booklet from the CRT-D company to minimize the risk of CRT-D malfunction due to electromagnetic interference. In general, strong electro-magnetic field or radiofrequency signal will interfere the pacemaker. Please keep a distance of >15 cm (6 inches) from an active mobile phone. Household electrical or electronic appliance usually does not affect pacemaker.
15. CRT-D generator will need to be replaced in few years' time when the battery is depleted.

## Risk and Complications

1. The procedure carries certain risks.
2. Major complications include death (<1%) and perforation of heart chambers (<1%).
3. Other potential risks include wound infection (<1%), wound haematoma (<1%), vein thrombosis (<1%), air embolism, contrast allergy, vascular injury, pneumothorax and haemothorax.
4. Special risks related to the device include lead dislodgement, insulation break or fracture, and pocket erosion.
5. The special left ventricular lead can cause damage to coronary sinus or cardiac veins (6%), and is more prone to dislodgement (9%).

## Alternative Treatment / Investigation

Alternative treatments include continuation of medical therapy or more invasive surgical treatment (such as cardiac transplant).

## Disclaimer

This leaflet only provides general information pertaining to this operation / procedure. While common risks and complications are described, the list is not exhaustive, and the degree of risk could also vary between patients. Please contact your doctor for detailed information and specific enquiry.

## Reference

Smart Patient Website by Hospital Authority:  
Cardiac Resynchronization Therapy Defibrillator (4/2019)

### Patient's Label

Patient Name: \_\_\_\_\_

Hospital No: \_\_\_\_\_

Episode No: \_\_\_\_\_

Patient's Signature: \_\_\_\_\_ Date: \_\_\_\_\_