Gleneagles Hospital
HONG KONG
港怡醫院

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| Hosp No. | : | HKID No.: |
| Case No. | : | |
| Name | : | |
| DOB | : | M / F |
| Adm Date | : | |
| Contact No. | : | |

# Procedure Information Sheet - Cardiac Resynchronization Therapy Defibrillator (CRTD)

## 1. Introduction

1.1. 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.

## 2. Importance of Procedure

2.1. 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 you refuse this procedure, you may have persistent or worsening heart failure symptoms and the result may be detrimental or even fatal especially when VT or VF occurs. Alternative treatments include continuation of medical therapy or more invasive surgical treatment (such as cardiac transplant).

## 3. Before the Procedure

3.1. Preliminary investigations including blood tests, chest X-ray, electrocardiogram and echocardiogram of the heart will be performed.
3.2. You need to sign an informed consent.
3.3. 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.
3.4. An IV infusion will be set up and you need to fast for 4-6 hours.
3.5. Shaving and disinfection near the implant site may be required.
3.6. If you are a female, please provide your last menstrual period (LMP) and avoid pregnancy before the procedure as this procedure involves exposure to radiation.

## 4. The Procedure

4.1. This invasive procedure is performed under local anesthesia in a cardiac catheterization centre. You are alert during the procedure, but we may give you sedation to calm you down.
4.2. Electrodes are adhered to the chest to monitor the heart rate and rhythm. Blood oxygen monitor through your finger tip will be set up. Measurement of blood pressure from your arm will be taken during the examination.
4.3. Skin disinfection will be performed and a small skin incision (about 3-5 cm long) will be made under your left (sometimes right) clavicle.
4.4. Contrast may be injected intravenously to visualize the veins in your arm and needle puncture under the clavicle may be required to obtain access to your vein.
4.5. 3 leads will be advanced to your heart chambers through your 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.

4.6. The generator will be connected with the lead(s) and implanted in a pocket created under the skin or muscle.
4.7. VF may be induced under sedation for testing the proper functioning of the CRT-D.
4.8. The wound will be closed with suturing material and covered with pressure dressing.
4.9. The procedure usually takes around 3-4 hours.

## 5. After the Procedure

5.1. After the procedure, you will be kept on close monitoring in the ward.
5.2. Nursing staff will check your pulse and wound regularly.
5.3. You should inform your nurse if you find blood oozing from the wound site.
5.4. You may resume oral diet as instructed.
5.5. Mild wound pain is common. You may take simple analgesic to relieve pain.
5.6. Antibiotics will be given for a few days to minimize the risk of wound infection.
5.7. You may be discharged from hospital several days after the CRT-D implantation.
5.8. Before discharge, CRT-D testing and programming will be performed and VF may be induced.

## 6. Follow Up

6.1. 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.
6.2. You may need to come back to the ward or clinic for suture removal 1 week after the procedure. You may remove the dressing 2-3 days after suture removal.
6.3. Please avoid lifting the affected arm for 1 week, and avoid vigorous arm movement in the first month after the procedure.
6.4. You will be arranged to attend CRT-D clinic for regular 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.
6.5. Please carry your CRT-D identity card at all times.
6.6. Follow your 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 your 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.
6.7. CRT-D generator will need to be replaced in few years' time when the battery is depleted.

## 7. Risk and Complications

7.1. The procedure carries certain risks.
7.2. Major complications include death (<1%) and perforation of heart chambers (<1%).
7.3. Other potential risks include wound infection (<1%), wound haematoma (<1%), vein thrombosis (<1%), air embolism, contrast allergy, vascular injury, pneuomothorax and haemothorax.
7.4. Special risks related to the device include lead dislodgement, insulation break or fracture, and pocket erosion.
7.5. The special left ventricular lead can cause damage to coronary sinus or cardiac veins (6%), and is more prone to dislodgement (9%).
7.6. Broken guidewire (0.1-0.8%).

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## 8. Remarks

8.1. It is hard to mention all the possible consequences if this procedure is refused.

8.2. The list of complications is not exhaustive and other unforeseen complications may occasionally occur. The risk quoted is in general terms. In special patient group, the actual risk may be higher.

8.3. Should a complication occur, another life-saving procedure or treatment may be required immediately.

8.4. If there is further query concerning this procedure, please feel free to contact your nurse or your doctor.

## 9. Reference

9.1. American College of Cardiology Foundation, American Heart Association (2008). Guidelines for Device-based Therapy of Cardiac Rhythm Abnormalities. Retrieved from: http://circ.ahajournals.org/content/circulationaha/117/21/e350.full.pdf

9.2. American College of Cardiology Foundation, American Heart Association and European Society of Cardiology Committee (2006).Guidelines for Management of Patients with Ventricular Arrhythmias and the prevention and sudden cardiac death. Retrieved from: http://circ.ahajournals.org/content/114/10/e385

9.3. Hospital Authority (2019). Smart Patient. Retrieved from: https://www.ekg.org.hk/pilic/public/Cardiac_PILIC/Cardiac_CardiacResynchronizationTherapyDefibrillator_0117_eng.pdf

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I, _____ acknowledged that the above information concerning the operation or procedure has been explained by Dr _____. I have also been given the opportunity to ask questions and received adequate explanations concerning the condition and treatment plan.

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| Name: | |
| Patient No.: | Case No.: |
| Sex / Age: | Unit Bed No.: |
| Case Reg. Date & Time: | |

Patient Signature: _____

Patient Name: _____

Date: _____