

Implanted cardioverter defibrillator



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An Implanted Cardioverter Defibrillator, or ICD, is a small battery-operated device placed over the heart to keep track of one's heart rate and rhythm. The device is made to send low or high energy impulses to correct abnormal heart rates and rhythms. Modern ICDs have a pacemaker function that works to control the heart rate if it goes out of normal or desired range or after a shock is delivered. If the heart beats too slow, it will send an electrical impulse to trigger the heart to beat (American Heart Association, 2016).

Who Needs One?

ICDs are recommended for individuals with cardiac dysfunctions that place them at high risk for a deadly cardiac arrhythmia or sudden cardiac death. If one has experienced a ventricular arrhythmia before, had a heart attack, survived cardiac arrest, has a congenital heart disease or long QT syndrome, they are at risk for a ventricular arrhythmia (AMA, 2016). Ventricular arrhythmias are more life threatening than other arrhythmias because the ventricles pump blood to the vital organs (Ignatavicius, Workman, and Rebar, 2018). These “ can cause severe problems with contractions of the heart chambers by: 1) Not allowing your heart chambers to fill with enough blood because the heart pumps too fast, or 2) Not allowing enough blood to be pumped out to your body because your heart pumps too slowly or too irregularly” (John Hopkins, 2019). If an individual goes into cardiac arrest ventricular tachycardia is commonly the rhythm that leads to the failure of the ventricle. Ventricular fibrillation causes complete chaos of the heart and there is no synchronized rhythm; the heart is just quivering. This means

there is no blood pumping effectively in any part of the body and this can cause death in just 3 minutes if not rapidly treated (Ignatavicius et al., 2018). The Subcutaneous ICD (S-ICD) was developed to overcome limitations of the transvenous ICD, particularly lead-related issues. They have been used in younger patients who need lifetime therapy, have limited vascular access and high risk of infection. Although most patients suitable for an ICD can receive the S-ICD, it is contraindicated in patients who require pacing, CRT or anti-tachycardia pacing for ventricular tachycardia because the only pacing the device offers is limited and only after a shock (Chieng, Paul, and Denman, 2019).

The Procedure

“ The ICD is made of three components: 1) the generator that produces the electrical impulse, 2) one to two leads, insulated flexible wires, that conduct those impulses between the generator and the heart, and 3) electrodes at the end of the lead that allow the impulse from the leads to transfer into the heart” (John Hopkins, 2019). The generator is about the size of a pocket watch and the leads can be inserted through a blood vessel with a small incision; this is safer and more beneficial than open heart surgery (AMA, 2016). A physician inserts the ICD by making a small incision under the collarbone where the wires are threaded through the heart’s blood vessel. Before attaching the generator, the wires are tested. The generator is then implanted under the skin (John Hopkins, 2019).

For the S-ICD, the pulse generator is inserted into a subcutaneous pocket at the left midaxillary line, at the fifth/ sixth intercostal space. The electrode is

tunneled subcutaneously from the pocket towards the xyphoid incision. If a ventricular arrhythmia is detected, an 80J shock is then delivered. Post shock bradycardia pacing at 50 bpm can be delivered for up to 30 seconds. This procedure has even more advantage than the traditional ICD for it avoids complications such as “ pneumothorax, hemothorax, cardiac tamponade, lead dislodgement and endocarditis” (Chieng et al., 2019).

Nursing Diagnoses

Pre-procedure. According to Ackley and Ladwig (2014) appropriate pre-procedure nursing diagnoses may include: 1) Decreased cardiac output r/t possible dysrhythmia (p. 179), 2) Risk for ineffective cerebral tissue perfusion: risk factor: decreased blood supply to the brain from dysrhythmia (p. 199), 3) Fear r/t threat of death and change in life status AEB verbal expression of fear and anxiety (p. 353), 4) Readiness for enhanced knowledge: expresses an interest in learning (p. 508).

Post-procedure. According to Ackley and Ladwig (2014) appropriate post-procedure nursing diagnoses may include: 1) Risk for infection: risk factor: invasive procedure (p. 480), 2) risk for bleeding: risk factor: invasive procedure, treatment-related side effects (p. 156), 3) Anxiety r/t anticipation of shock AEB reported fear of a shock from the ICD (p. 137).

Care Concerns

Caring for a patient with an ICD involves knowing their underlying condition, the type of device they have, and determining their own concerns about having the device. If coming to the hospital due receiving a shock from the

ICD, the ICD should be examined by a physician. The patient should be placed on ECG telemetry to monitor their heart real time. If a shock is delivered in the hospital, it can be determined if the shock was appropriately given to an arrhythmia. Electrolytes should be monitored and corrected if out of normal range. The patient should be assessed for their perception and interpretation about being shocked and sources of support. An antiarrhythmic drug may be prescribed and should be given as ordered to prevent additional shocks. Patients may also be prescribed an antiarrhythmic and also an antianxiety when leaving the hospital (Braunschweig, 2010).

Education

Before patients are discharged with their ICD, they and their significant family need to be educated about living with the ICD. Patients need to be educated about their underlying condition and why they are receiving an ICD (this should be done prior to the procedure). Take home information about the condition should be given as well. After receiving an ICD, a manufacturer identification card will be given to the patient that indicates first that the individual has one, and also what type of ICD, the type of leads, model and serial number, the date it was implanted, and the paced rate. This card should be carried at all times. (AMA, 2016; John Hopkins, 2019). Batteries last 5-10 years and eventually it will need to be replaced, but that is less work than the initial procedure. They can shower and bathe as the device is protected from the water by their layer of skin (AMA, 2016).

Stay away from magnets and strong electrical fields and inform airport or other screeners that you have an ICD. Magnets will deactivate the ICD; if

they have been near a magnet contact the health care provider. It takes about eight weeks for the ICD to set in place so the doctor will need to be asked when it will be safe to return to normal activity. Having an ICD can cause some anxiety, but it is not uncommon in the first months or year. One should consult their doctor if experiencing anxiety or depression (AMA, 2016).

This information should be taught verbally to the patient and any significant family members. The way in which the information is given will depend on the nurse's learning and health assessment of the patient. The instructions should be given verbally as well as in written form and any other way the patient deems she/he will learn from. Using the teach back method is an effective way to know if the patient and/or family understands what has been presented to them.

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