

Invasive Treatments

ICD

1. Patients with ejection fraction of less than 35% are:
 - a. High risk for fatal dysrhythmia
 - b. High risk of sudden cardiac death
 - c. Unable to reduce these risks with medications alone
2. **Implantable Cardioverter Defibrillator (ICD)**
 - a. **Implanted device that will shock and terminate a fatal dysrhythmia**
 - b. Implanted in patients with low ejection fraction
 - c. ICD has two main parts to the device:
 - i. Pulse generator
 - Implanted subcutaneously (pocket incision) in the pectoral area of the patient
 - ii. “Lead” (wire)
 - Connects to the generator on one end
 - Threaded into the right ventricle on the other end
 - The lead detects fatal ventricular dysrhythmias and delivers a shock
3. **Procedure for ICD implantation:**
 - a. **Performed with local anesthesia**
 - b. **Performed in a cath lab or operating room**
4. To qualify for an ICD, the patient needs to meet one of these qualifications:
 - a. **Ejection fraction is 35% or less with symptomatic heart failure**
 - b. **Ejection fraction is 30% or less with asymptomatic heart failure**
 - c. **Must be at least 40 days past a myocardial infarction**
 - i. After an MI, ejection fraction is temporarily reduced
 - ii. After 40 days, re-measurement of the ejection fraction is a more accurate assessment
 - iii. During the 40-day wait, patient can wear an external (wearable) defibrillator
 - Worn like a vest, under the clothes
 - ♥ Vest has built in electrodes that detect shockable dysrhythmias
 - ♥ Many lives have been SAVED from wearing these vests while waiting the 40 days
 - Common brand: Life Vest
5. Complications:
 - a. Similar to pacemakers (see Pacemaker/ICD section in ECG class)
6. Nursing Implications:
 - a. Similar to pacemakers (see Pacemaker/ICD section in ECG class)

7. Patient Education:

- a. Similar to pacemakers, plus what to do if ICD discharges a shock, teach CPR to family members or have them take a CPR class (see Pacemaker/ICD section in ECG class)

Cardiac Transplant

1. A heart transplant is the gold standard for end-stage heart failure treatment
 - a. **Long-term solution for end-stage heart failure**
 - b. After a transplant, patients return to NYHA Functional Class I
2. Post-transplant patient needs:
 - a. **Life-long immunosuppressant therapy**
 - i. **Immunosuppressive drugs**
 - ii. Antibiotic prophylaxis
 - iii. Antihypertensive medications
 - iv. Diuretics
 - v. Lipid lowering drugs
 - vi. Proton pump inhibitors
 - b. **STRICT isolation precautions**
 - i. Patients must wear masks for several months after the operation
 - ii. **Avoid working in soil**
 - iii. **Avoid eating raw or unpeeled vegetables and fruits**
 - iv. Avoid indoor plants, birds, and **litter boxes**
 - c. **Right heart catheterization with a right ventricle biopsy**
 - i. Performed every week for 4 weeks after the operation
 - ii. **Purpose:**
 - **Biopsy is the only TRUE way of detecting organ transplant rejection**
 - iii. After 4 weeks, biopsies will be done less frequently
 - d. **Left heart catheterization to examine the coronary arteries**
 - i. **Performed annually**
 - ii. **Purpose:**
 - **Detect coronary artery disease**
 - Transplant destroys cardiac nerves, so patient will not have ability to experience chest pain from ischemia
 - e. **Cardiac Rehabilitation**
 - i. **Patient will require a longer warm-up than other patients**
 - f. Close monitoring for signs of organ rejection:
 - i. Heart failure symptoms (shortness of breath or activity intolerance)
 - g. Strict medication compliance

3. Heart transplant wait list is long
 - a. Heart donations are still in low supply
 - b. LVAD is a short-term solution for patients on the waiting list
 - c. LVAD is a long-term solution for non-surgical candidates (destination therapy)
 - i. Left Ventricular Assist Device (LVAD):
 - Machine acts like a left ventricle
 - One end of the pump attaches to the left ventricle
 - Other end attaches to aorta
 - Machine pumps blood from the left ventricle into the aorta through the device
 - d. **Hospice**
 - i. **An option when death is imminent in the next 6 months**
 - ii. ICD would be deactivated so shocks would not be delivered at time of death
 - iii. Hospice helps patient enjoy remaining days and keep them comfortable