

# Biventricular Pacemaker Implantation

## What is a biventricular pacemaker?

A biventricular pacemaker (BVP) is a type of permanent pacemaker placed in your chest. It improves the function of the heart. The heart has four compartments, or chambers. The upper chambers are called atria, and the lower chambers are called ventricles. For biventricular pacing (BVP), one wire goes from the pacemaker to the right ventricle. Another wire goes from the pacemaker to the left ventricle. BVP helps the heart work more efficiently by helping the two pumping chambers of the heart work together properly. This procedure is also called cardiac resynchronization therapy.

BVP is different from pacemakers that treat slow heart rates. Pacemakers that treat slow heart rates have a wire that leads only to the lower right side of the heart (right ventricle). These pacemakers also sometimes have a wire that leads to the right atrium (upper chamber on the right side of the heart) as well.

## When is it used?

BVP is used to treat people with heart failure. It may help if you still have shortness of breath even though you are taking medicine for the problem and if your heart's electrical signal is slower than it should be. This is detected with an electrocardiogram, or ECG.

## How do I prepare for the procedure?

Plan for your care and recovery after the operation, especially if you are to have general anesthesia. Allow for time to rest and try to find people to help you with your day-to-day duties.

If you need a minor pain reliever in the week before surgery, choose acetaminophen rather than aspirin, ibuprofen, or naproxen. This helps avoid extra bleeding during surgery. If you are taking daily aspirin for a medical condition, ask your provider if you need to stop taking it before your surgery.

Follow any instructions your healthcare provider gives you. If you are to have general anesthesia, eat a light meal, such as soup or salad the night before the procedure. Do not eat or drink anything after midnight and the morning before the procedure. Do not even drink coffee, tea, or water.

Follow your provider's instructions about not smoking

before and after the procedure. Smokers heal more slowly after surgery. They are also more likely to have breathing problems during surgery. For this reason, if you are a smoker, you should quit at least 2 weeks before the procedure. It is best to quit 6 to 8 weeks before surgery. Also, your wounds will heal much better if you do not smoke after the surgery.

No special preparation is needed for local anesthesia.

### **What happens during the procedure?**

The nurse will wash your upper chest and sometimes shave the area. You will be given medicines to relax your muscles and keep you from feeling pain during the operation. If you feel discomfort during the procedure, tell your healthcare provider immediately.

The healthcare provider will make a cut in the skin over the upper chest and separate the tissues to make a place for the pacemaker. The artificial pacemaker system consists of one or two electrodes and a battery unit. The electrodes -- wires that are insulated nearly to their tips -- are inserted into a vein located under your collarbone. With the help of X-rays, your healthcare provider places wires in your left and right ventricles. The tips of the electrodes make contact with your heart muscle and transmit the electrical impulse that stimulates the heartbeat. The other ends of the electrodes are connected to the pacemaker unit, which contains batteries and electronic circuits. The healthcare provider places this unit under the skin of your upper chest and sews the pocket closed.

### **What happens after the procedure?**

You may stay in the hospital for 1 to 3 days, depending on your condition. You will remain in bed and your heart will be monitored. The day after the procedure you will be encouraged to walk in preparation for leaving the hospital.

Before you leave the hospital, your healthcare provider will check your pacemaker using a small table-top computer, called a programmer, and a wand. The wand is about the same size as a remote control. Your provider puts the wand on your body, about where the pacemaker is located. This allows your healthcare provider to get information from the pacemaker about what the heart is doing and how well it is working. An echocardiogram may also be done as part of the check of your pacemaker. If needed, your healthcare provider can adjust the pacemaker using the programmer and the wand. It is not

painful, and it usually takes just a few minutes.

You may learn how to check the function of the pacemaker using the telephone. The function of the pacemaker can also be checked at follow-up visits with your healthcare provider.

Your healthcare provider may explain how having a pacemaker might affect your lifestyle and when the battery in the pacemaker may need to be replaced.

Ask your healthcare provider what other steps you should take and when you should come back for a checkup.

### **What are the benefits?**

You will probably have less shortness of breath than you did before the procedure. Your heart may beat in a healthy rhythm, and you may resume a more normal lifestyle. The benefits may be greater several months after the pacemaker is placed in your chest.

### **What are the risks?**

- There are some risks when you have general anesthesia. Discuss these risks with your healthcare provider.
- A local anesthesia may not numb the area quite enough and you may feel some minor discomfort. Also, in rare cases, you may have an allergic reaction to the drug used in this type of anesthesia. Local anesthesia is considered safer than general anesthesia.
- The wire could puncture one of the lungs, the vein, or the heart cavity.
- Like any electrical/mechanical device, the pacemaker may need a replacement if it stops working properly.
- The pacemaker wire may become dislodged or break.
- There is a risk of infection or bleeding.

The risks associated with BVP are slightly higher than with some other pacemakers because it is more difficult to place the wires properly on both sides of the heart. Ask your healthcare provider how these risks apply to you.

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