



Why Do I Need An Electrophysiology Study?

An electrophysiology study is a procedure conducted by a heart rhythm cardiologist in hospital. Patients can be seen as a day case or an overnight stay. Recording wires are carefully placed in the heart, through needle punctures into the veins.

These recording wires are used to analyze the function of the heart's electrical system, and to diagnose abnormal heart rhythms. It can enable your doctor to determine the cause of the abnormal heart rhythms and assist them in making decisions in relation to future treatment (if required).

How does the heart work normally?

The heart is a muscular pump, which delivers blood, containing oxygen to the body. It is divided into two upper chambers, or "atria", which collect blood returning via the veins, and two lower chambers or "ventricles", which pump blood out through the aorta (main artery) and the lungs.

Normally, the heart beats in a regular, organized way, at a rate of 60-100 beats per minute. This is because it is driven by the "sinus node", a clump of specialized cells situated in the atria which emits electrical impulses. These electrical impulses spread through the atria and then into the ventricles via a connecting relay-station, (the "AV node"). The sinus node controls the timing of the heart, according to the needs of the body. An example of this is during exercise, when the heart rate speeds up. When the heart is beating normally like this, we refer to it as "sinus rhythm", or "normal sinus rhythm".

What can happen if there is an abnormality in the electrical system of my heart?

The normal electrical conduction system consists of a "pathway" of conduction responsible for all normal beats. However, sometimes this pathway can be bypassed due to extra electrical connections, or "pathways", or extra pathways combine with the normal pathway and result in a short-circuit. These short-circuits can result in rapid heart beat.

Often these pathways are present at birth, but may only start to work in adulthood. At other times, or in other patients, heart beats arise from a "rogue" or "ectopic" source, rather than the normal mechanism. If such beats arise early in the normal cycle of heart beat, they can give rise to sensations of extra beats, or missed beats.

An extra beat (an ectopic), can trigger the short-circuit, and a fast heart beat. It can travel down the pathway and up the normal conduction system. If this continues, palpitations can result. The heart can suddenly "bump" then start to race, causing a fast pulse. If the abnormal heart rhythm uses the upper chambers of the heart, this is known as supra-ventricular-tachycardia or SVT.

This type of heart rhythm disturbance is usually not life-threatening, but can cause unpleasant symptoms and interfere with your quality of life. If the abnormal heart rhythm comes only from the lower, pumping chambers of the heart (the ventricles), it can be dangerous, particularly if it is associated with fainting, and especially if a patient already has a heart condition, such as a previous heart attack scar. These heart rhythm disturbances can be treated in a variety of ways and your doctor will discuss treatment options with you, either before, or after he/she has performed your electrophysiology study.

What does the procedure involve?

Before the study is performed you may be asked to stop taking some of your medications for up to 2 weeks prior to the procedure. Your doctor/nurse should give you specific advice about this. You will also have some routine tests such as blood sampling and a physical examination. Your doctor/nurse will visit you, or see you ahead of admission, (a pre-admission visit), to discuss details of the procedure and any risks/benefits that may be associated with it. You will be given the opportunity to ask questions before you sign a consent form for the procedure.

Your electrophysiology study will be performed in a cardiac catheter laboratory, a room which is similar to an operating theatre, equipped with X-rays. There will be a team of people present, some of whom you may have met before. The doctor, or electrophysiologist, will carry out the procedure with the help of a physiologist, who gives technical support, nurses, who will look after you and assist the doctor and a radiographer who will assist with the Xray equipment. An electrophysiology study is an invasive procedure, which is usually performed using local anaesthetic, and small needle-punctures, used to access the heart via the veins. You may also be given some sedation, which makes you feel relaxed and sleepy.

During the study you will be required to lie flat and the local anaesthetic will be administered to your right groin and possibly in the side of your neck or upper chest. Some fine tubes will then be inserted into the vein where the local anaesthetic has been applied. Fine wires or electrical recording catheters are then passed through the tubes and positioned within the heart. This is done with the guidance of an Xray machine; therefore it is important that you tell your nurse/doctor before the procedure if you think you may be pregnant.

Once the wires are positioned within the heart the doctor is able to record electrical activity from specific areas of your heart. Extra beats are also delivered using external pacemaker, which may bring on your palpitations. This is necessary to see where the heart rhythm is coming from. It is possible to put the heart back into normal rhythm within a few seconds, by delivering some extra beats. The procedure should enable the doctor to detect any abnormalities in the electrical system of your heart. The procedure normally takes approximately 45-60 minutes.

Once the procedure is over, the wires and tubes will be removed and the nurse/doctor will apply some light pressure over these areas for a few minutes to stop any bleeding. You will then be transferred back to the ward where you will be asked to rest in bed for 2-4 hours.

However, in some centers, under certain conditions, your electrophysiologist may have talked to you about proceeding directly to a catheter ablation treatment immediately after the electrophysiology study is completed, and the number, type and location of extra pathways in your heart have been demonstrated.

The reason for proceeding directly will be the desire to avoid having to go through a further similar procedure all over again. If ablation is being contemplated after the study, this will have been fully explained to you in advance, and you will have been asked to consent to the procedure, and sign that you have understood all the risks and benefits fully.

What are the risks associated with the electrophysiology study?

The benefit of having an electrophysiology study is that it can enable your doctor to determine the cause of any abnormal heart rhythms and assist the patient in making decisions in relation to your future treatment (if required). There is no procedure in medicine completely risk-free and an electrophysiology study is no exception, although it is very safe.

The risk of any serious complications occurring during the study is less than 1%. Your doctor/nurse will discuss this with you in more detail before the procedure is performed. If a catheter ablation procedure is done after the electrophysiology study, the additional risks will have been explained in full.

How long will I have to stay in hospital?

Most people recover quickly from the procedure and feel well enough to go home later on the same day.

However your doctor may want to initiate further treatment whilst you are in hospital depending on the findings of your study. This will be discussed with you after your procedure.

You should be able to carry on with normal activities the following day. You should avoid heavy lifting for about 2 weeks afterwards. If a catheter ablation procedure is done after the electrophysiology study, you are likely to stay in overnight for one night.

Following the study it is quite common to be aware of your own heartbeat, even in normal rhythm. Some people are aware of extra or "missed beats". Try not to worry too much about these symptoms, which usually settle down with the passage of time.

