

## Electrophysiology Study and Catheter Ablation

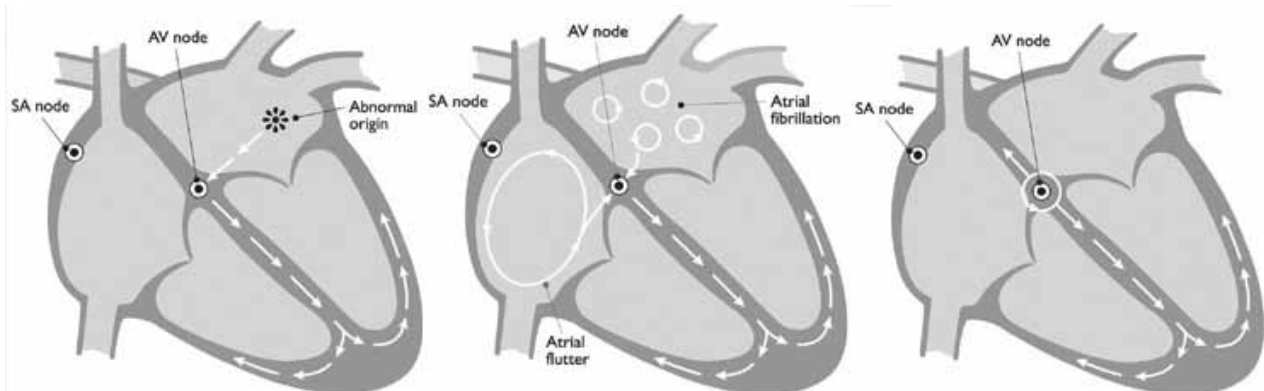
The information in this document is provided to assist patients undergoing a cardiac electrophysiology study understand the procedure and hopefully answer such questions as:

1. What is an electrophysiology (or "EP") study?
2. Are there any alternative methods to test my heart?
3. What will the study involve?
4. What is catheter ablation? Can it be done in my case?
5. What preparation is required?
6. What happens following the study?

**It is important that you ask your cardiologist prior to the study if there is anything that you do not fully understand.**

Your heart is a specialised muscle that pumps blood around your body. It contains four chambers that hold the blood as it moves around the heart. The two upper chambers (called atria) receive blood from the lungs and body, and contract to move blood to the two lower chambers (called ventricles). The ventricles then contract to pump blood back to the lungs and to the rest of the body. Contraction of these chambers is controlled by the heart's electrical system.

### Examples of Abnormal Rapid Heartbeat Patterns



#### Atrial Tachycardia

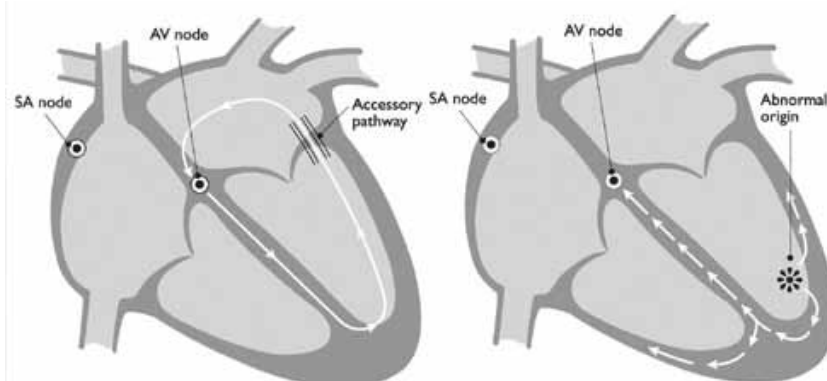
Abnormal origin of the electrical impulse from a small area in the atria other than the SA nodes.

#### Atrial Fibrillation/Flutter

Abnormal electrical impulses originate from one or more large areas of the atria.

#### AV Nodal Re-Entry Tachycardia

Abnormal circular condition occurs near the AV node.



#### AV Re-entry Tachycardia

Abnormal circular conduction utilising the AV node and an "accessory pathway" connecting the atria and ventricles (e.g. Wolff-Parkinson-White Syndrome).

#### Ventricular Tachycardia

Abnormal origin of the electrical impulse from the ventricles.

## 1. What is an electrophysiology (or “EP”) study?

An electrophysiology (or “EP”) study is a technique used by cardiologists to evaluate and treat abnormalities of the heart’s rhythm. The minute electrical impulses (which cause the chambers of the heart to contract), can be measured using special thin wires called electrode catheters.

These can be passed through veins (usually in the groin) to the heart. The electrical signals detected by these catheters are amplified and displayed on a television screen, and are also recorded on a computer. By analysing these recordings during normal, fast, slow or irregular heart activity, the accurate diagnosis of heart rhythm disorders can be made.

## 2. What alternative methods are available?

There are other methods of investigating heart rhythm problems, and you may already have undergone some of these. They include electrocardiography (ECG), 24-hour heart monitoring (Holter Monitoring), event monitors (such as the “King of Hearts” monitor), Tilt Table testing and exercise stress testing. While these methods may be helpful, they have limitations. Unless you have symptoms during one of these tests, your diagnosis may remain unclear.

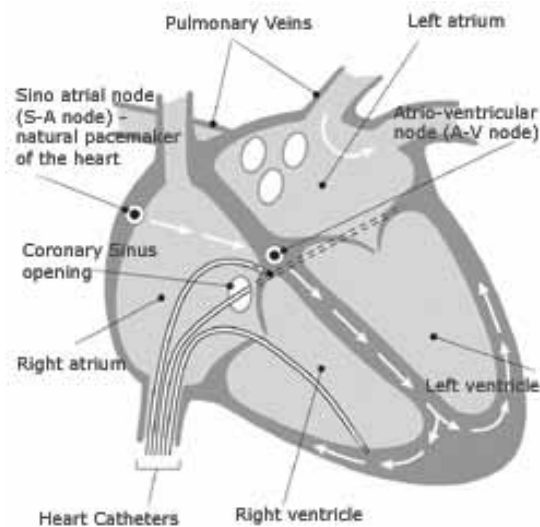
With an EP study, we are able to pinpoint the electrical problem in your heart more accurately compared to the other tests.

During an EP study it is often possible to reproduce your symptoms, at which time the recordings will make the diagnosis. A curative procedure can frequently be administered at the time of the study.

## 3. What will the study involve?

The EP study is conducted in the Catheter Laboratory.

A cardiologist will perform the test, assisted by a nurse and a technician. You will be awake during the procedure although sedation may be given, particularly if you feel very anxious. The cardiologist/doctor will tell you what is happening as the study progresses, and will want to know if any feelings or sensations you experience during the study are similar to your heart symptoms.



Normal electrical pathway of the heart and positions of the catheters in the heart.

You will lie on a theatre table, which has an X-ray machine above it. You will be covered with sterile drapes and towels and your groin and/or side of your neck and upper chest will be cleansed with an iodine or alcohol solution. The doctor will then insert some local anaesthetic at the sites where catheters are to be inserted. (Figure 2). You may feel some discomfort with this, but this will disappear as soon as the anaesthetic starts to work (usually less than a minute). If you do feel excessive discomfort or any other symptoms during the procedure you should tell the doctor and nurse.

Wires (or “electrode catheters”) are then advanced to the heart and positioned using x-ray guidance (Figure 3). It may take an hour or more to position these wires correctly.

After the wires have been positioned, electrical testing of the heart is performed. You may experience palpitations or a sensation of racing heartbeat, as a result of the electrical stimulation or rhythm disturbance. The rhythm can be restored to normal usually with small electrical impulses (which you will not feel), but occasionally with an electric shock. Such shocks are only given if you lose consciousness (so that you will not feel or remember them).

Like any test where doctors insert tubes or wires into the body, EP studies do carry some risk, although this is very low. Possible complications include blood clots, damage to the heart wall, heart valves or blood vessels, bleeding, bruising and infection. If an

electrode catheter needs to be inserted from the upper chest or neck there is a very small risk of causing lung collapse. All of these complications are very uncommon and can be treated.

The radiation exposure to you during the study is minimal, and no specific radiation protection is required.

**However, you should advise your doctor prior to the study, if there is any chance that you may be pregnant.**

#### **4. What is catheter ablation? Can it be used in my case?**

Some heart rhythm disturbances, particularly those arising from the atria (upper chambers) or from circuits involving both the atria and ventricles, can be cured by delivering a high frequency (radiofrequency) electric current, directly to an area of the heart muscle.

A special steerable catheter is positioned in the area pinpointed by the preceding EP study. Electric current is then delivered which results in heating of the heart tissue at the end of the catheter. Heating the tissue destroys the electrical pathway or group of electrical cells responsible for the abnormal heart rhythm. There may be some minor discomfort during current delivery (usually felt as a burning sensation in the chest), and small doses of pain-killing medication is often administered.

The electrical current is given in pulses lasting 30-60 seconds, and a number of pulses may be required. The cardiologist performing the ablation will ask you not to take any deep breaths or move whilst the electrical current is being delivered. After the ablation has been performed you will be observed for a period of time in the catheter laboratory to ensure that the procedure has been successful.

Occasionally during catheter ablation it is possible to damage the heart's normal conducting system (particularly if the abnormal circuit runs close to the normal electrical pathway). Permanent damage to the heart's normal conducting system may result in an excessively slow heartbeat, requiring implantation of a permanent pacemaker.

The overall risk of this complication is approximately one in two hundred. The cardiologist performing the ablation will let you know if there is any higher risk of this complication in your particular case.

One other rare complication that may occur when catheter ablation is performed on the left side of the heart is "clot embolism". A small blood clot can form adjacent to the area of heart tissue that has been ablated. This can be pumped in to the bloodstream where it may occlude blood vessels in various areas of the body. If, for example, the clot travelled through the bloodstream to the brain this could cause a stroke.

To minimise the risk of this complication, patients who undergo ablation on the left side of the heart are given anti-clotting medications intravenously during the study and are usually prescribed aspirin or other anti-clotting drugs for approximately four to six weeks following the procedure.

Other complications include formation of blood clots in the leg, damage to the heart wall or blood vessels, or a partial collapse of one lung. These uncommon complications are easily identified and can be treated. The overall risk of any complication is approximately one in one hundred.

Not all heart rhythm problems can be treated with catheter ablation. If your doctor thinks that this technique could be used in your case he/she will discuss this with you and obtain your consent for this procedure to be performed at the time of your EP study.

#### **5. What preparation is required?**

The majority of patients undergoing EP study and/or catheter ablation are admitted for less than one day. Procedures undertaken in the afternoon may require an overnight stay. You will be required to arrive at the hospital, at the time and location advised.

Any drugs that you take to prevent heart rhythm abnormalities should be stopped 2 to 3 days before the procedure, or as advised by your doctor. Please notify us if you are taking warfarin, as this particular drug will need to be ceased prior to your procedure.

Bring pyjamas with you as you can change into these on your return to the ward, following your test. Do not wear unnecessary jewellery or bring money or valuables into hospital.

The nurse in charge of your care will prepare you for the EP study. You will be dressed in a hospital gown. Before you go to the catheter laboratory your consent form will be checked, and your blood pressure, pulse and temperature will be recorded.

#### **6. What happens following testing?**

At completion of the procedure the wires are removed from the heart and tubes are removed from the groin. The cardiologist will discuss the results of the test with you. You will then return to your bed where you will be given something to eat and drink.

The catheter insertion site will be regularly inspected, and your pulse and blood pressure will be re-checked.

If the groin approach has been used, it will be necessary for you to lie flat for at least 3 hours to prevent bleeding from the site. You may be kept on a heart monitor for some hours and your doctor may recommend further treatment.

You will be notified of follow up appointments if necessary.

If you have any further questions, please do not hesitate to ask your doctor.

## Discharge Information

We would like to ensure that your transition from hospital to home is as smooth as possible.

1. You must not drive a car on the day of your procedure, and for 24 hours post-procedure. It will be necessary to arrange for someone to drive you home from hospital. We prefer that you are not alone the night following your procedure.
2. Avoid any strenuous activities for at least 24 hours following the procedure.
3. If bleeding occurs, apply firm pressure to the insertion site, rest quietly and contact your Doctor.
4. If the puncture was made in the groin, please remove the dressing the following morning. If there is no swelling, you may also resume normal activities at that time.

If you experience any of the following symptoms:

- Increased swelling around the wound;
- Excessive bleeding (anything more than a slight ooze);
- A change in sensation or feeling in your leg;

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Rest quietly and contact Hollywood Private Hospital on **(08) 9346 6000** and ask for the Clinical Nurse of the Angiography Suite or the After Hours Clinical Nurse Manager for assistance and advice.