

A GUIDE FOR PATIENTS

Electrophysiology Study and Catheter Ablation



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The information in this booklet is provided to assist patients undergoing a cardiac electrophysiology study.

The following questions will be answered:

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?

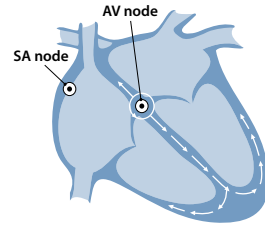
It is important that you ask your cardiologist prior to the study if there is anything that you do not fully understand.

Electrophysiology Study and Catheter Ablation

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.

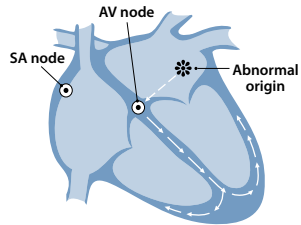
In order to maintain efficient pumping of the heart there must be synchronised contraction of the atria and ventricles. Disorders of the heart’s electrical system result in a fast, slow or irregular heart beat, and the ability of the heart to pump blood becomes impaired. Symptoms such as dizziness, weakness, blackouts, shortness of breath, palpitations or chest discomfort may occur.

Examples of abnormal rapid heartbeat patterns



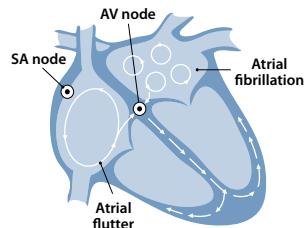
AV Nodal Re-Entry Tachycardia

Abnormal circular conduction occurs near the AV node.



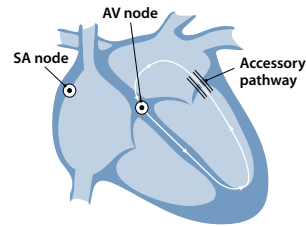
Atrial Tachycardia

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



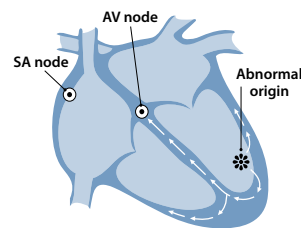
Atrial Fibrillation/Flutter

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



AV Re-Entry Tachycardia

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



Ventricular Tachycardia

Abnormal origin of the electrical impulse from the ventricles.

1. What is an electrophysiology 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 the veins (usually in the groin) to the heart.

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 their limitations. Unless you have symptoms during one of these tests, your diagnosis may remain unclear.

With an EP study, we are usually 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 undertaken at the time of the study.

3. What will the study involve?

The EP study is conducted in the Cardiac Catheter Laboratory. (Figure 3, page 7)

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 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.

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 occasionally the side of your neck and upper chest will be cleansed with an iodine or alcohol solution.

The cardiologist will then insert some local anaesthetic at the sites where catheters are to be inserted (normally the right groin). 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 up to the heart and positioned using x-ray guidance (Figure 2, page 7). It may take up to 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 won't 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 small. Possible complications include blood clots, damage to the heart wall, damage to the 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 lung collapse. All of these complications are very uncommon and can be treated.

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

Many heart rhythm disturbances can be cured by delivering radiofrequency energy directly to an area of the heart muscle. This is normally done in the same procedure after the problem is diagnosed with the EP study.

A special steerable catheter is positioned in the area pinpointed by the preceding EP study. Current is then delivered which results in heating of the heart tissue at the end of the catheter. Heating destroys the electrical pathway or group of electrical cells responsible for the abnormal heart rhythm.

There may be some discomfort during energy delivery (usually felt as a burning sensation in the chest), and pain-killing medications are often administered. Cryoablation (freezing) energy may be used in some cases. This generally does not cause pain.

The ablation is given in pulses lasting 30 - 120 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 energy is being delivered. After the ablation has been performed you will be observed for a period of time in the catheter laboratory, before you return to the ward.

Figure 2. Normal electrical pathway of the heart and positions of the catheters in the heart.

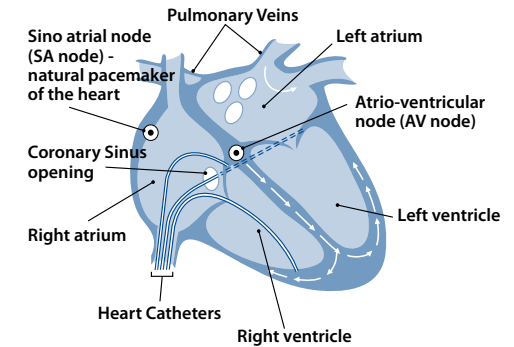


Figure 3. Catheter Laboratory. The radiation exposure to you during the study is minimal, and no specific radiation protection is required.

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



Catheter ablation is a very successful treatment, generally producing cure of arrhythmias in over 90 per cent of cases but occasionally a repeat procedure is required. Your cardiologist will discuss the details of your individual case with you before the procedure.

Atrial fibrillation (AF) is a more complex arrhythmia, requiring longer ablation procedures, usually performed under general anaesthesia. Success depends on the type and duration of AF and other factors (eg. age, blood pressure), and more than one ablation may be needed. You should discuss this in detail with your cardiologist/electrophysiologist.

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 may result in an excessively slow heartbeat, requiring implantation of a pacemaker.

The overall risk of any complication for simple ablation is approximately one in two hundred. For atrial fibrillation the risks are higher - as much as one in twenty. The cardiologist performing the ablation will let you know if there is any risk of this complication in your particular case.

A rare complication that may occur when catheter ablation is performed on the left side of the heart (such as for AF) is "clot embolism".

A small blood clot can form on the catheter or over the area of heart tissue that has been ablated. This can then dislodge and may occlude blood vessels in 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 (Heparin) intravenously during the study and are usually prescribed aspirin or other anti-clotting drugs (eg. Warfarin) for some time following the procedure.

Other complications include bleeding or formation of blood clots in the leg, bleeding around the heart, damage to other heart structures or blood vessels and damage to adjacent structures such as nerves and the oesophagus (food pipe). These complications are usually identified early and may be treated.

The overall risk of any complication is approximately one in one hundred except that for AF ablation is 2-3%.

Not all heart rhythm problems can be treated with catheter ablation. If your doctor thinks that his 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 on the day of the procedure. You will be advised when and where to report for admission.

You will need to fast (no food or drink) for 4-6 hours before your procedure – please confirm this with your cardiologist.

Any drugs that you take to prevent heart rhythm abnormalities should generally be stopped 5 days before the procedure, but please confirm this with your cardiologist. Warfarin may need to be ceased prior to your procedure and sometimes Clexane injections will be prescribed.

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. Bring your medications with you.

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 the procedure?

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

The catheter insertion sites will be regularly inspected, and your pulse and blood pressure will be monitored. It will be necessary for you to lie flat for at least three hours to prevent bleeding from the site.

You may be kept on a heart monitor for some hours and your cardiologist may recommend further treatment. You may require an overnight stay. If you have any further questions please do not hesitate to ask your cardiologist.

Discharge Information

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

You must not drive a car for at least 24-48 hours post-procedure. It will be necessary to arrange for someone to drive you home from the hospital and you should have someone staying with you the night following your procedure.

Avoid strenuous activities for at least 5 days following the procedure in order to minimize the risk of bleeding.

If bleeding does occur, apply firm pressure to the insertion site, rest quietly and contact the hospital or your cardiologist.

If the puncture was made in the groin you may remove the dressing the following morning. If there is no lump or swelling, you may resume gentle activities at this time.

Watch for the following

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

Please contact Hollywood Private Hospital Coronary Care Unit on (08) 9346 6021, if you have any further questions or concerns.

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