

Patient information factsheet

Electrophysiology study (EPS)

Your doctor has recommended you have the above procedure.

This factsheet has been written to help you understand what is involved. If there is anything you do not understand, or you are unsure why you need this treatment, please ask a member of your healthcare team who will be happy to explain further.

To help you understand this factsheet please refer to our “how the heart works” factsheet first. This is available on: www.uhs.nhs.uk or ask a member of your healthcare team.

What is an electrophysiology study (EPS)?

An EPS is a test which looks at your heart's electrical activity in detail. It is done to find out why your heart beats too quickly, or why it does not beat in a regular pattern. (This may be due to an extra electrical pathway or area of conduction within your heart).

An EPS is used to diagnose and treat a wide variety of abnormal heart rhythms (arrhythmia). Your doctor believes an abnormal heart rhythm may be the cause of your symptoms and the EPS will allow us to find out more about this, and decide on the most effective treatment for you.

Your doctor will recommend you have an EPS when other tests cannot provide enough information to diagnose your arrhythmia.

The procedure

An EPS is a catheter technique where flexible wires (catheter electrodes) are passed through a vein in your groin (or rarely, through the vein under your collarbone) and carefully placed at specific positions within your heart to record the electrical signals (activity). An EPS records how your heart reacts to extra electrical signals (paced beats) delivered within the different areas of the heart. This allows your doctor to collect detailed information about the cause of your arrhythmia and choose the most appropriate treatment for you.

An EPS may also be performed in combination with a procedure called radio-frequency catheter ablation. This procedure is performed under a local anaesthetic, with sedation, which will help you to relax.

X-ray screening will be used during the procedure so if you think you may be pregnant you should let us know before the procedure.

Risks of the procedure

An EPS is safe, however as with any procedure there are potential risks. Your individual risk of complications will be identified and fully explained by your doctor before you have your procedure. An EPS is performed safely in both children and adults.

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If you are known to have underlying coronary heart disease the risks are slightly increased.

All the risks outlined below can be treated and are rarely life-threatening.

- **Bruising and bleeding at the access site:** this is common in the groin following the procedure. However, this usually disappears within a week and does not cause a problem.
- **Blood vessel damage:** occasionally the catheter electrodes can accidentally damage the blood vessels when being moved into position within the heart. The risk of this happening to you is between 3% and 5%. Serious injury to the blood vessels requiring a surgical procedure to repair the damage is extremely rare and occurs in less than 1% of patients.
- **Pulmonary embolism, or deep vein thrombosis (DVT):** the risk of developing blood clots in the legs (DVT) or heart that travel to the lungs (pulmonary embolism) is extremely rare, less than 1%.
- **Transient ischaemic attack (TIA) / cerebrovascular accident (CVA) - commonly called a stroke:** The brain cells in the part of the brain served by the affected blood vessel die of lack of oxygen and nutrients due to a blockage. Symptoms can be slurred speech, limb/ facial weakness and loss of memory or recall depending on the area of the brain affected. The difference between a TIA and CVA is the duration of the symptoms. (Less than 48 hours is usually classified as a TIA). This is extremely rare, less than 1%.
- **Cardiac tamponade:** during placement the catheters may puncture the heart muscle causing blood to collect around the heart. If this happens the doctor may need to insert a drain to remove it. The risk of this happening to you is less than 1%.
- **Death:** this is extremely rare but with any procedure there is always a small risk.

Additional risks

Occasionally we have difficulty gaining access through the blood vessels in the groin. In this case we will access the blood vessels through the chest wall. To do this we make a small incision in the chest wall to pass catheter electrodes through the blood vessels into the heart, this has potential additional risks:

- **Pneumothorax:** (if the vein under your collarbone is used) very occasionally, the catheter electrodes can puncture the lung wall. Air leaks out of the lungs and collects in the space between the lung and chest wall, resulting in partial or complete collapse of the lung. If this happens the doctor may need to insert a drain to re-inflate your lungs. The risk of this happening to you is less than 1%.
- **Haemothorax:** (if the vein under your collarbone is used) very occasionally, the catheter electrodes can puncture the lung wall. Blood leaks out of the lungs into the pleural cavity, the space between the lungs and the walls of the chest. If this happens the doctor will need to insert a drain to reinflate your lungs. The risk of this happening to you is less than 1%.

Before admission

- If you are taking medication to control your heart rhythm the admission coordinator may advise you to stop taking your tablets five days before your procedure. This is to allow your doctor to make a better assessment of your heart rhythm. Stopping your tablets may cause your symptoms to return.
- If you are taking warfarin (blood thinner) regular blood tests will be needed for at least four weeks before the procedure, usually at your doctor's surgery. We ask that you keep your INR between 2.0 and 3.0. A record of this should be kept in your yellow warfarin book. We also request that you check your INR three days before your admission to confirm it is in this range to enable the procedure to go ahead.

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- If you are on another type of blood thinner, specific instructions will be on your admission letter.

You will be advised not to eat or drink before your procedure, specific instructions will be on your admission letter.

The above advice should be followed unless your admissions letter advises otherwise.

Before the procedure

When you arrive on the ward a nurse will talk to you and your family about your hospital admission and answer any questions you may have. Before the procedure, you will have blood tests taken and an electrocardiogram (ECG) recorded. A doctor will see you to explain the procedure and ask you to sign a consent form. This is to ensure you understand the procedure and the associated risks. If you have any worries or questions, please do not be afraid to ask.

It is important to tell your nurse or doctor if you have any allergies or have had a previous reaction to drugs or other tests. If you are having the procedure done under a general anaesthetic, you will also talk to an anaesthetist.

A doctor or nurse will insert a small needle into a vein in your hand (cannula) in order to give you drugs during the procedure. You will be asked to shave your groin and if necessary your upper chest and be given a hospital gown to wear.

If you are diabetic, your nurse will discuss your tablets/insulin dose with you, because not eating may affect your blood sugar levels.

How long will the procedure take?

The procedure could take a couple of hours. You may wish to let your family know so that they do not worry.

During the procedure

You will be taken to the catheter lab where a nurse will stay with you and be there to reassure you throughout the procedure. There is a lot of equipment in the room, which is used to monitor your heart rhythm. You will be awake during the procedure, but to help you relax your doctor will give you a short acting sedative.

The doctor will inject a local anaesthetic into your groin to numb your leg. This may sting a little and you may feel some mild discomfort. When the local anaesthetic has taken effect, the doctor will insert a small tube (sheath) into your groin. You should not feel any pain, but if you do, please let your doctor know. Through the sheath the doctor will gently thread several flexible wires (catheter electrodes) into your heart. These special wires will record the electrical signals from inside your heart. The catheters are about the size of a small drinking straw. The doctor carefully moves the catheters into position within your heart under x-ray screening. You should not feel pain during this part of the test. Sometimes your doctor may also put a catheter in one of your veins below your collarbone.

Once the catheters are in place, your doctor will attempt to start your arrhythmia by giving your heart small electrical impulses (paced beats) to make it beat at different speeds. This allows the doctor to collect detailed information about the cause of your arrhythmia and pinpoint where the area of extra electrical activity responsible for your arrhythmia is within

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your heart. During this time you may feel your heart speeding up, slowing down or missing a beat. This may cause you some mild discomfort. This is a normal part of the test and in the controlled setting of an EPS is not a danger to you.

Occasionally you will also be given drugs to bring on your arrhythmia. The test will be stopped after your doctors have collected and recorded all the information they need, including how fast your heart is beating, where in your heart the arrhythmia is coming from and how easily it can be stopped.

Your arrhythmia should stop by itself. However if it continues your doctor will need to stop it by pacing your heart into a regular rhythm or giving you drugs to slow your heart rate down. Occasionally, it may be necessary to give you electric shock treatment (cardioversion). If you need this treatment your doctor will give you more sedation (as cardioversion is not performed when you are awake).

Please tell your nurse or doctor if you have any uncomfortable symptoms during the procedure, for example:

- chest pain
- dizziness
- shortness of breath

It is important that your doctor knows how you feel when you have your arrhythmia.

Results and next steps

Depending on the findings, the doctor/s will decide on the next step and will discuss the findings with you. If a potentially treatable problem is present, the doctors will explain this to you and seek your permission to proceed. Occasionally, you may be not ready for such and the doctors will discuss the future plan with you. Don't worry about surprises being found during the EPS. In most cases, the potential underlying problem would have been discussed with you and a plan put in place before the procedure.

Occasionally, the study may be negative – meaning your doctors may not be able to find any abnormal rhythm problem in your heart. Your doctor will discuss the reason for this with you and may offer to repeat the EPS at another time or deem that you really don't have a heart rhythm problem.

After the procedure

After the procedure is completed the catheter and sheath will be removed. Firm pressure will be applied to your groin where the catheter was inserted to stop any bleeding.

You will be moved to the recovery area where you will be monitored for a short time. On returning to the ward you will need to rest for a few hours. You may feel a little sleepy until your sedative has worn off. The nurse will record an ECG, check your blood pressure, pulse and feel your foot pulses, and check your groin for any bleeding. It is important that you remain in bed and avoid bending your affected leg for approximately two hours after the catheter has been removed. This is to prevent any bleeding from the puncture site. After this time you will be able to get up if there are no complications. You will be able to eat and drink normally as soon as you return to the ward. The nurse will remove the small needle in your hand.

If you feel any palpitations or dizziness after the test, please let the nurse know.

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If the doctor has used the vein under your collarbone, you will also have a chest x-ray to make sure that you do not have a pneumothorax (pocket of air) in your lung.

Results

Your doctor will usually discuss the results and any ongoing treatment plan with you and your family after the procedure (see Results and next steps section on the previous page) .

Going home

You will normally be able to go home the same day. It is important to ask a family member or friend to collect you and drive you home. If you are being discharged on the same day as your procedure we would advise you to have someone stay with you for the night. If you don't have anyone who can stay with you overnight, please let the CRM coordinator know before your procedure.

Before you are discharged your doctor will advise you regarding the medicines you will need to take, or stop and your follow-up care.

Caring for your wound

You will have a small dressing on your puncture site that can be removed the next day. It is important to keep the area clean and dry until it has healed. If you notice any swelling, redness or oozing please let your GP know.

Resuming normal activities

You can resume your normal daily activities when you leave hospital. You should not strain or lift heavy objects for a few days so the incision site can heal. Unless your job requires you to lift heavy objects, you can return to work in a day or two.

The DVLA instructions state that you cannot drive for at least two days, but we recommend that you don't drive for one week after the procedure. If you hold a Group 2 PSV licence (lorries/buses) you are not allowed to drive for six weeks and you need to inform the DVLA.

Follow-up care

The cardiac rhythm management (CRM) team will give you specific follow-up instructions when you leave hospital. The doctor will write a letter to your GP detailing your hospital stay and treatment.

Cancellations

Unfortunately we do sometimes have to cancel procedures. If this happens to you, we will always try to explain the reason. We fully appreciate that this is a stressful time for you and your family and we will do our best to provide you with a new date that is convenient for you as soon as possible.

Who will perform my procedure?

Your procedure will be performed by a specially trained doctor with appropriate experience (although we aren't able to guarantee that you will be treated by a particular member of staff). If the doctor is undertaking training on this procedure they will be supervised by an appropriately qualified colleague

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Contact us

If you have any questions regarding your procedure please call: **023 8120 8436** to speak to a cardiac rhythm management (CRM) clinical nurse specialist.

You can also email: **uhs.crmnurses@nhs.net**

If you have a query relating your admission date please contact the cardiac rhythm management coordinator on: **023 8120 8772**.

Useful links

The following websites also provide useful information:

www.bhf.org.uk

www.heartrhythmcharity.org.uk

An online version of this factsheet is available on our website **www.uhs.nhs.uk**.

Navigate to: Our services > Blood, heart and circulation > Cardiac rhythm management > Useful information and resources.

For a translation of this document, or a version in another format such as easy read, large print, Braille or audio, please telephone **023 8120 4688**.

For help preparing for your visit, arranging an interpreter or accessing the hospital, please visit **www.uhs.nhs.uk/additionalneeds**