



University Hospitals Bristol
NHS Foundation Trust

Patient information service
Bristol Royal Hospital for Children

Information about electrophysiology studies (EPS) and radio-frequency ablation



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Bristol Royal Hospital
For Children

The information provided within this booklet is general information. The doctor or nurse caring for your child will discuss their individual treatment and offer more specific information.

Normal heart rhythm

The normal heart is composed of two pumps lying side by side, each of which has a top chamber (atrium) and bottom chamber (ventricles). The heart is stimulated electrically and speeds up and slows down according to the frequency of the electrical impulses. These impulses start off from the top part of the right atrium, at a specialised bit of muscle called the sinus node. The impulse is then passed down the atrium to the junction of the atrium and the ventricles.

In the normal heart, there is an extra bit of muscle called the AV node, which allows impulses to conduct from atrium to ventricles. There is no other electrical connection between the atrium and the ventricles, so all impulses must pass through this AV node. These electrical impulses then pass throughout the ventricles, causing them to tighten.

In some patients, there is an extra electrical connection in addition to the AV node. This is sometimes called an 'accessory pathway', and this focus or pathway may be causing electrical impulses to be generated or conducted wrongly. This is what causes your child's heart to race or feel irregular.

What is an electrophysiology study?

An electrophysiology study (EPS) is a procedure conducted by a heart rhythm specialist (an electrophysiologist). It enables the doctor to look at the function of the heart's electrical system and therefore to work out the cause of your child's strange heart rhythm. It will help the doctor to decide upon a course of future treatment.

What is a radio frequency ablation procedure?

It is often referred to as an 'ablation' procedure for short.

It involves passing a small wire (called a catheter) through a vein at the top of each leg. Once the accessory pathway has been found, the catheter has heat passed through it to the tip, where it should then be possible to make a small burn within the heart, directly against the accessory pathway. This destroys it, permanently stopping it from conducting electricity.

There are a variety of heart rhythm disorders that are treated by using the ablation process; for example, the treatment of any extra or abnormal pathways which are identified throughout the EPS process.

The radio frequency ablation procedure is successful in approximately 90 per cent of patients. There is a small risk that the path may just be stunned and could come back, but this is very uncommon.

Where does it take place and who does it?

The procedure will take place in the cardiac catheterisation suite in the hospital, which is on the fourth floor (referred to throughout this booklet as the cardiac cath lab for short).

It will be performed by your child's electrophysiologist (a doctor who specialises in heart rhythms).

What happens in the catheter lab and how long does it take?

Your child will be put to sleep with a general anaesthetic. The catheter is inserted into the vein in the groin and moved to specific positions in the heart. Electrical conduction within the

heart is monitored by sensors at the tip of these catheters. The heart is stimulated with electrical impulses or medicines and the catheter is manipulated within the heart. Your child may have EPS or EPS and ablation.

Once the procedure has finished, the catheters will be removed and your child will be taken to the recovery suite. When your child wakes, one parent/carer and a nurse from the ward will collect them and transfer them back to the ward.

The length of time the procedure takes will be different for each patient. It can take anywhere between 45 minutes to several hours. However, your child's doctor will be able to give you more specific information regarding this.

How soon are results likely to be available?

The electrophysiologist who has performed the procedure will usually see you on the same day and discuss the initial results with you. On some occasions it may be necessary for your child to have an echocardiogram (a scan of the heart) the day after the procedure. The electrophysiologist will review your child after the procedure, and decide when your child can be discharged. Usually this is the day after the procedure.

They should be able to tell you when they wish to see you and your child again in the outpatients department.

What are the complications?

The main risk of the procedure is the risk of damage to the AV node. The risk of injury to the AV node depends very much on where the accessory pathway is located. Probably only in about 10 per cent of cases is there a real risk to the AV node. If the extra pathway is close to the AV node, then we tend to use a different technique called 'cryoablation'. This essentially means freezing the pathway. This is much safer, as there is a greater degree of reversibility.

Other complications that can arise after the procedure include:

Localised bleeding

More commonly, there may be minor bleeding or bruising at the groin site where the catheters were put in. This problem can be lessened by applying firm pressure to the puncture site.

Loss of foot pulses

The leg artery may go into spasm or be blocked by a blood clot, causing pulses in the leg to stop or not be as strong. The majority of cases will go back to normal on their own, whilst a few may require intravenous medicine to restore the pulse.

Arrhythmia

Following the ablation, it is quite common for your child to be aware of their own heartbeat, even in normal rhythm. Some people are aware of extra or 'missed' beats. These symptoms usually settle down with time.

Heart block

This means there has been some disturbance in heart rhythm, so that the ventricles beat more slowly than the atrium. It can be described as first degree heart block, second degree heart block or complete heart block. The overall published risk of heart block is about two to three per cent. It is lower than that at Bristol children's hospital due to the less aggressive approach used.

Damage to heart muscle and valves or blood vessels

Manipulating the catheters along blood vessels or within the heart can, very rarely, cause tears or perforations requiring surgical repair.

Stroke

This is a one in 1,000 risk. Blood clots may form during the procedure and may cause a stroke if they travel to the brain via the bloodstream. Heparin is a blood thinning medicine given at the beginning of the procedure to reduce that risk.

Your electrophysiologist will discuss the risks with you and your child and obtain written, informed consent prior to the procedure. The above list does not contain every possible problem and other rare complications may occur. Please ask your electrophysiologist if you require any further information.

What happens before the procedure?

There is an opportunity to bring your child to a pre-admission clinic before the scheduled date for the procedure. If you decide to do so, your child will have their temperature, pulse, blood pressure and oxygen saturations checked as well as their height and weight. They will also have any pre-procedure investigations performed, which may include an echocardiogram (scan of the heart) and an ECG (a tracing of the heart rhythm).

Your child will also be seen by one of the cardiac nurse specialists and a ward doctor. This is also a good opportunity to visit the ward before your child's procedure, so that you are familiar with the layout etc.

Most children are either admitted to the ward the morning of the procedure (if they have attended the pre-admission clinic), or are admitted the night before.

Your child will be allocated a nurse who will admit you to the ward and provide all of the necessary information for your stay in hospital.

It is important that your child has an empty stomach before an anaesthetic. Food or milk is not allowed for six hours before the procedure, and water or squash can be taken until two hours before the procedure. The nurse caring for your child will tell you when your child is likely to be taken for their procedure and their fasting times.

Your electrophysiologist will explain the actual procedure your child is going to have, and offer the opportunity for you to ask any questions you may have. They will then gain informed consent and you will be required to sign a consent form when you are happy that everything has been fully explained. Depending on when your child is admitted to the ward, they may come to see you the day before or the day of the procedure.

If your child is on any medication, your electrophysiologist or cardiac specialist nurse will advise you if your child needs to stop taking this medication before the procedure, and will inform you exactly when to stop it.

Your child will also be seen by an anaesthetist (the doctor who will give your child the anaesthetic so that they remain asleep throughout the procedure) before the procedure.

Please note that older children are required to shave their groin area so that it is easy to clean/sterilise in the cath lab.

What happens the day of the procedure?

Your child will be given a theatre gown to wear just before they are taken to the cath lab for the procedure. They may prefer to keep their pants or pyjama bottoms on underneath the gown as well. These can be removed in the cath lab.

Your child will be taken to the cath lab by the nurse caring for them on the day of the procedure (this is on the fourth floor in the children's hospital). Parents are welcome to stay with their child until they are asleep, before the procedure begins.

The anaesthetist will then use either a mask or an intravenous cannula (needle) inserted into your child's hand to give them 'sleepy' medicine. It is also the decision of the anaesthetist, following review of your child and discussion with you, whether or not your child will be given a pre-medication before going to the cath lab (the purpose of which is to make them sleepy before leaving the ward).

What happens when the procedure is finished?

When your child is stable and ready to come back to the ward, a nurse will come and get you (if you have remained on the ward) or will contact you by telephone and ask you to come back to the ward. Only one parent can go to collect the child in the recovery suite due to limited space.

On the ward, your child will most likely be nursed in the same bed space as on admission (unless the patients have had to be moved around for other reasons, in which case you will be informed). They will be closely monitored and frequently checked by the nursing staff. The groin area will be checked to ensure that there is no fresh bleeding, and they will also be checking the pulses in your child's feet.

Your child will be encouraged to lie in bed with their legs straight (if this is comfortable) for four hours after the procedure to help the wound to heal and prevent any bleeding. While they are on bed rest, your child will need to use a bedpan or urinal. DVDs, books, games or hand-held gaming devices are useful at this stage.

Later on, your child may feel like sitting up and then eventually walking to the toilet. They will need someone to assist them in case they feel slightly dizzy (this can be common after this type of procedure)

Occasionally the groin may begin to bleed again, and if this should happen, pressure will be applied to the area for several minutes. If the wound continues to bleed, a special pressure dressing may be applied to stop the bleeding, which will remain on overnight.

Your child will be able to drink clear fluids soon after they return to the ward, but do not be alarmed if they vomit, as this can often happen and is a common occurrence after an

anaesthetic. If they continue to vomit or feel sick, the nursing staff will give them some anti-sickness medication.

When they are feeling more awake, they may have something light to eat, and will be encouraged to drink plenty of fluids.

When can my child go home?

Provided your child has remained well, they will usually be allowed to go home the day after the procedure. Many children will require some investigations before discharge. These may include an echocardiogram, an ECG and a chest X ray. The doctors and nurses caring for your child will explain what tests need to be performed before discharge.

Caring for your child at home

Caring for the wound site

The puncture site is very small and does not need stitches. It should heal within a few days, and should be kept clean and dry for at least two to three days after the procedure. Therefore your child should not be bathed during this time. Older children and teenagers may find this difficult, and can therefore have a quick shower about 48 hours after the procedure. They should be advised not to use soap or rub on the affected area.

If your child develops a temperature or becomes unwell at home following the procedure, then contact the ward as they may have developed an infection after the procedure. You may be advised to bring your child back to the ward for review.

You are advised to contact the ward if you notice any of the following:

- the puncture site is red or swollen
- there is oozing or weeping from the site
- there is a hard lump in the area
- if you notice any discolouration or swelling in the limb below the puncture site, particularly if it looks different or feels cooler than the other limb.

If you do notice any bleeding from the wound site, press directly on the puncture site with a clean tissue or something similar for five to ten minutes. If the bleeding continues, phone the ward for advice.

Pain relief

Some children may complain of pain in the groin area for a few days after the procedure, particularly if they have a bruise. They may benefit from some paracetamol (Calpol or Disprol).

Bruising in the area is normal, but if your child has difficulty in using their leg or there appears to be excessive bruising then please contact the ward for advice.

Medication

Unless your electrophysiologist has advised otherwise, if your child was on medication before the procedure you should continue with this.

In some instances, you may be asked to start giving your child a new medicine. If this is the case, your doctor will discuss the new medication and the reason for starting it before your child is discharged. You will be given a supply of the medication from the hospital on discharge.

Return to normal activities

It is normal for your child to feel a little tired for a few days after they are discharged. It may be advisable to keep them off school for a few days, and older children should avoid cycling and sports for a week after the procedure. The doctor caring for your child will offer more specific information relating to this.

Other useful information

Bed status

Please ring the ward before your scheduled admission date to check that there is still a bed available for your child.

Medication

Please bring in all of your child's medications, which will help the ward staff in prescribing and administering them. They will be kept safely in the medicine cupboard or locked away on the medicine trolley for the duration of your child's stay.

Luggage

Please keep this to a minimum, as space on the ward is limited.

Food

Food is provided for your child. You can bring in food supplies for yourself – this should be clearly labelled and can be stored in the fridge-freezer in the parent's room. There is also a microwave, cold water dispenser and tea/coffee making facilities (please note no hot drinks are allowed on the ward).

Accommodation

There is a pull down bed by your child's bed space. Only one parent/carer can stay overnight. Other parents/carers should make arrangements to sleep at home or book into a hotel. We have details of local accommodation if required.

Car parking

The closest hospital pay and display spaces are at St Michael's Hospital. Parking permits to reduce the costs are available for families who are staying overnight. There are roadside parking meters and Trenchard Street NCP is also close to the main entrance. Please ask the ward for more details.

Visitors

There is a 'quiet time' between 1pm and 2pm on the ward. Visitors are welcomed outside of this time, but no more than two at a time. Siblings are welcome, but regrettably, no other children.

Cancellation

Cancellations are avoided where possible, but occur due to emergencies or equipment failure. If this should happen, you will be informed as soon as possible.

Useful contact numbers

Ward 32

0117 342 8332 / 0117 342 8679

Cardiac nurse specialists

0117 342 8286 / 0117 342 8578

(answerphone out of hours)

Outpatients

0117 342 8400 / 0117 342 8402

Cardiology secretaries

Dr Graham Stuart

0117 342 8852

Dr Mark Walsh

0117 342 8852

Notes and queries

Please note that if for any reason you would value a second opinion concerning your diagnosis or treatment, you are entirely within your rights to request this.

The first step would usually be to discuss this with the doctor or other lead clinician who is responsible for your care.

Smoking is the primary cause of preventable illness and premature death. For support in stopping smoking contact **Smokefree Bristol** on **0117 922 2255**.

As well as providing clinical care, our Trust has an important role in research. This allows us to discover new and improved ways of treating patients.

While your child is under our care, you may be approached about them taking part in research. To find out more please visit: **www.uhbristol.nhs.uk/research-innovation** or call the research and innovation team on **0117 342 0233**.

For access to other patient leaflets and information please go to the following address:

www.uhbristol.nhs.uk/patients-and-visitors/information-for-patients/

Hospital switchboard: 0117 923 0000



Minicom: 0117 934 9869



www.uhbristol.nhs.uk



For an interpreter or signer please contact the telephone number on your appointment letter.



For this leaflet in large print, audio or PDF format, please email patientleaflets@uhbristol.nhs.uk.

