



Royal Papworth Hospital
NHS Foundation Trust

Ablation procedures

Patient's guide and
agreement to consent form

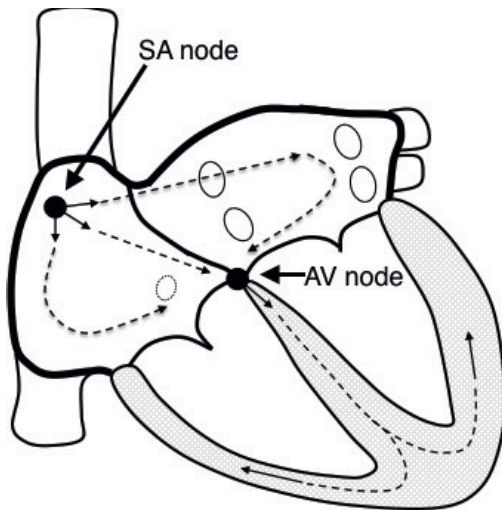
Instructions for clinicians

- Apply addressograph label above and on **both** consent pages
- Strike through pages that do not apply to this patient
- Complete consent form indicating page numbers that refer to risks and benefits of intended procedure
- Remove copy page of consent form for filing in patient notes
- Advise patient to keep this booklet and consent form throughout their treatment pathway and to bring it to all appointments

Cardiac Electrophysiology

Normal heart function

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, called ventricles, which pump blood to the body and lungs.



Normally, the heart beats in a regular organised way at a rate of 60 to 100 beats per minute. This is because it is driven by a specialised area of muscle in the right atrium called the sino-atrial (SA) node which emits electrical impulses.

These impulses spread through the atria making the atria contract and pump blood through to the ventricles. The impulses are channelled through another area of special cells called the atrio-ventricular (AV) node into the ventricles and then spread throughout the ventricles making them contract and pump blood to the body and lungs. The normal pathway the electrical impulses follow is called the 'conduction system'.

The SA node controls the timing of the heart according to the needs of the body. An example of this is shown 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'.

Heart rhythm disturbance (Arrhythmia)

Sometimes the electrical impulses travel through the heart in a different direction. This can be because of extra electrical connections known as 'accessory pathways' or sometimes changes in the heart tissue that send the electrical impulses in abnormal directions. Often these pathways or changes are present from birth, but may start to work only in adulthood. Sometimes the heart has an extra electrical impulse that does not start from the SA node; this is called an 'ectopic' beat.

If the abnormal rhythm involves the upper chambers of the heart, the atria, this is called a supra-ventricular tachycardia or SVT for short. This type of heart rhythm disturbance is not life threatening, but can cause unpleasant symptoms and interfere with your quality of life.

If the abnormal heart rhythm arises from the lower chambers, the ventricles, it is known as ventricular tachycardia, or VT. This can be dangerous, particularly if it is associated with fainting. VT is also explained separately later in this booklet.

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Some heart rhythm disturbances can be identified by a simple heart tracing known as an ECG tracing, while others require more detailed investigation. This may include an electrophysiology study (EPS) which is explained on page 4.

Your doctor or arrhythmia specialist nurse will indicate which pages of this booklet apply to your procedure.

The catheter laboratory

All of the electrophysiology (EPS) and catheter ablation procedures described in this booklet are done in the Catheter Laboratory (Cath Lab) which is a room similar to an operating theatre. There will be a team of people present, some of whom you may have met before. The doctor who specialises in heart rhythm management, an electrophysiologist, will carry out the procedure with the help of a cardiac physiologist, who provides technical support. The nurses will look after you and assist the doctor and the radiographer, who will assist with the X-ray equipment.

Electrophysiology procedures

Pre-procedure preparation

Some procedures will require you to undergo additional investigations prior to or at the time of your procedure. This may include a transthoracic echo, trans-oesophageal echo, CT scan or coronary angiography.

If you are taking anti-arrhythmic drugs (AADs) to control your symptoms, it may not be possible to start the arrhythmia. For this reason, you may be asked to stop taking your AADs for a few days prior to the EPS procedure.

If you take blood thinning drugs (eg warfarin) you may be given specific instructions about monitoring your dosage and reporting blood test results to the arrhythmia specialist nurses (ASNs). It is very important to follow these instructions carefully as failing to do so may delay your EPS procedure.

During the procedure

During the procedure you will be lying flat on your back and will have several sticky pads on your back and chest which allow the doctor to record the electrical activity coming from your heart. You will be covered over with sterile paper sheets but will not have your face covered.

Electrophysiology procedures are minimally invasive procedures performed either using a general anaesthetic where you are put to sleep by an anaesthetist, or using a local anaesthetic. If you have local anaesthetic you will also be given some pain relief and sedation drugs through a cannula in your arm, which make you feel relaxed and sleepy. If you are uncomfortable during the procedure it is important that you tell the nurse immediately, so we can top up the pain relief medication.

Fine wires (catheters) are passed through a small tube into a vein (and occasionally an artery) at the top of your right leg. These are passed along the blood vessels and into your heart, using X-ray as a guide. Once the wires are in place, the electrical activity can be mapped from inside the heart. If the abnormal rhythm is not happening already, the doctor will try to start it artificially. This is done by stimulating the heart electrically via the wires positioned in your heart. This sometimes needs the addition of drugs that are administered via the cannula in your arm. This is likely to feel similar to your usual palpitations but sometimes can be uncomfortable and cause anxiety. The sedative and pain relief drugs given at the start of the procedure should avoid this being too unpleasant, and you can ask for further doses if you need them. It is possible to put the heart back to a normal rhythm within a few seconds by delivering some more extra beats.

After the procedure, all the catheter wires are removed, and a small dressing will be applied to the area at the top of your leg. Most of the sticky pads will be removed and you will be returned to the ward for observation and something to eat and drink before being allowed home.

After the procedure

Most people recover quickly from the ablation procedure and feel well enough to carry on with normal activities after a day or two. You may see some bruising around the groin area and may feel a small pea or marble sized lump near where the wires were put into your leg. This is normal and will disappear gradually over a few days or weeks. If the lump is any bigger than this or if you experience any pain or redness around the area, please contact your GP.

If your groin bleeds, please do not panic. Lie down flat and get someone to apply pressure to your groin until the bleeding stops. This can take up to 10-15 minutes.

You will have a small plaster over the incision site, which should be removed the day after your procedure. You may bath or shower the day after your procedure. Avoid putting talcum powder on or around the wound site until the wound has healed.

It is not unusual to have some chest discomfort after the procedure which should settle gradually over about a week. You can treat this with simple pain relief medication (eg paracetamol); it is usually best to take this regularly for a few days.

Some people experience palpitations after an ablation procedure. This is a normal part of the recovery process. It occurs because the area immediately around the ablation site is inflamed and irritable, which can give rise to extra electrical impulses. It may take a few weeks for this to settle down and rarely requires any treatment. If palpitations happen it is best to sit quietly for a few minutes and relax because anxiety can make the palpitations worse. If the palpitations do not seem to be settling or you are concerned about how you feel you should contact the arrhythmia specialist nurse (ASN) helpline detailed. In the very unlikely event that you feel very unwell, have chest pains or if you lose consciousness during the palpitations, you should call 999 for an ambulance.

You should avoid heavy lifting and strenuous exercise for two weeks. You are advised to have at least two days off work or a week off if you are expected to be driving or on your feet most of the time at work.

DVLA guidance states that you must not drive for two days after a catheter ablation. If you hold a group 2 vocational driving licence, there are greater restrictions on resuming driving. You should discuss the rules about this with your doctor or the arrhythmia specialist nurse (ASN).

The team of people involved in your care will include your doctor and arrhythmia specialist nurses (ASNs) at Royal Papworth, a cardiologist at another hospital if you have one, and your GP. If you take blood thinning drugs the team will also include your local anticoagulant service. If you have a pacemaker you will also see a cardiac physiologist who will check your device either at Royal Papworth or your local hospital. Arrangements will be made for you to be followed up by the most appropriate members of this team. This will involve either an outpatient clinic visit or by a telephone consultation.

When you leave hospital, you will be given written instructions about specific aftercare. Within one to two weeks, your doctor will write to your GP about your procedure and ongoing management arrangements and you will receive a copy of that letter.

Risks

All medical procedures carry some risks and electrophysiology studies and catheter ablations are no exception. The risks will vary depending on which procedure you are having and are highlighted individually.

Further help and advice

If you have questions, concerns or are having on-going symptoms please contact the arrhythmia specialist nurse (ASN) helpline on 01223 638947.

Diagnostic procedures

Electrophysiology Study

If it is not clear from the ECG tracing where the heart rhythm disturbance is coming from, your doctor may choose to map the electrical activity from inside your heart. This process is called an electrophysiology study (EPS). This may be done as a single procedure, so the best course of treatment can be discussed with you. Alternatively, if you are having an ablation, which is explained separately in this booklet, you may have an EPS at the beginning of that procedure.

Benefits

The benefit of having an EPS is to determine where the abnormal electrical activity is coming from. This will help us to offer the most appropriate treatment and to plan an ablation procedure if this is recommended.

Risks

- Groin bleeding/vascular damage 1% (1/100)

The procedure typically takes 1 hour.

Ventricular Tachycardia Stimulation

Another form of diagnostic study is called a ventricular tachycardia stimulation (VT Stim). This is performed as a single procedure to see how easily a fast and potentially dangerous rhythm can be induced.

Benefits

The benefit is to determine the likelihood of spontaneously developing dangerous heart rhythms and to enable the most appropriate treatment plan to be discussed with you.

Risks

- Groin bleeding/vascular damage 1% (1/100)
- Arrhythmia requiring shock 10% (1/10)

The procedure typically takes 1 hour.

Catheter Ablation

Once we know the origin of your arrhythmia, either by ECG or EPS, an ablation procedure may be recommended to reduce or stop your symptoms. Heart rhythm disturbances may be treated in a variety of ways and for many years drugs have been used to suppress fast heart beats. Over the past 25 years a technique called 'catheter ablation' has been developed as a treatment for a variety of heart rhythm problems. Catheter ablation aims to cure the abnormal heart rhythm by destroying or blocking the abnormal pathway that the impulses are following which should stop the palpitations.

The catheters positioned in your heart can be used to ablate the abnormal pathway or tissue by delivering a form of energy down the catheter to the target area within your heart. Most commonly, the energy used is a heat source called radio frequency energy which burns the tissue, but sometimes cryotherapy is used which freezes the area. Both methods destroy a small targeted area by changing the muscle tissue into scar tissue which is unable to conduct the electrical impulses.

Usually the ablation is done in stages so there can be periods during the procedure where it may seem nothing is happening. This is because it is necessary to wait to see if there is a recurrence of the abnormal rhythm after some ablation has been done, before going on to do some more.

There are several different ablation procedures used to treat different heart rhythm disturbances detailed in the following pages. Your doctor or nurse will have indicated which pages you should read and have crossed through those which do not apply to you. If you are unsure, please contact the arrhythmia specialist nurse help line on 01223 638947 for further advice.

AV Node Ablation

AV node ablation is used to manage atrial fibrillation (AF) by completely stopping the AF impulses from reaching the ventricles. This procedure is chosen when other AF treatments are either inappropriate or have been unsuccessful. A permanent pacemaker must be inserted either at the time of or prior to your AV node ablation. Your doctor will decide on the most appropriate timing for your individual circumstances.

A pacemaker is implanted under the skin, usually on the left side of your chest below your collar bone, with wires threaded along inside a vein and down into your heart. Once in position, the pacemaker is ready to send electrical impulses to stimulate your heart to beat regularly after the ablation procedure. The pacemaker will need to be checked at least once each year which can be done at your local hospital. The device lasts for approximately 7-10 years and will need to be replaced at these intervals.

The aim of the AV node ablation is to ablate all the conducting tissue at the AV node to prevent any impulse from reaching the ventricles. Once this has been done, the heart is stimulated to beat by the pacemaker alone.

Benefits

The benefit of having a pacemaker and AV node ablation is that it may stop the irregular heart beat and associated symptoms of AF. You may also be able to discontinue the drugs used to control your heart rhythm.

Risks

Risks of AV node ablation:

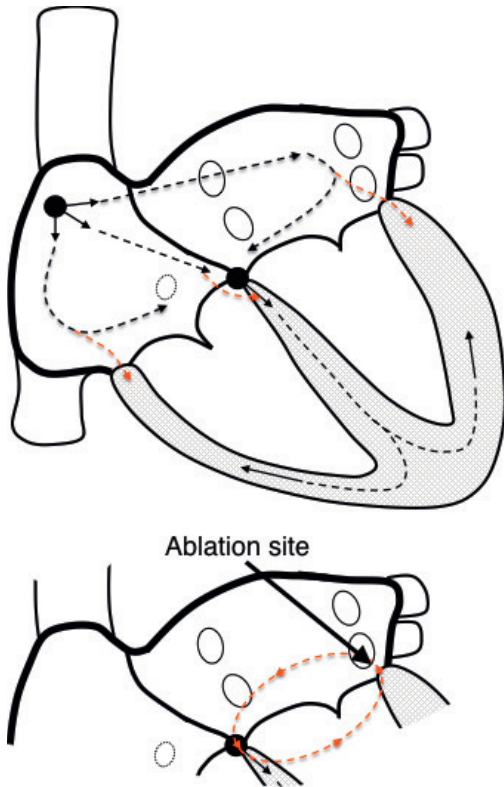
- Groin bleeding/vascular damage 1% (1/100)
- Pericardial effusion 1% (1/100)

Risks of pacemaker implantation:

- Localised bleeding/bruising 1% (1/100)
- Infection 1% (1/100)
- Pneumothorax 1% (1/100)
- Lead displacement 1% (1/100)
- Infection (subsequent generator change) 2% (2/100)

These procedures typically take 1-2 hours.

Supraventricular Tachycardia



Usually the electrical impulses in SVT are organised and follow one of a number of a defined pathways. Once the pathway is identified it can be ablated or removed.

The **success rate** of SVT ablation at Royal Papworth Hospital is considered to be **90 to 95%** with a single procedure. However, the ability to ablate certain types of SVT is dependent upon your heart arrhythmia being triggered on the day.

Benefits

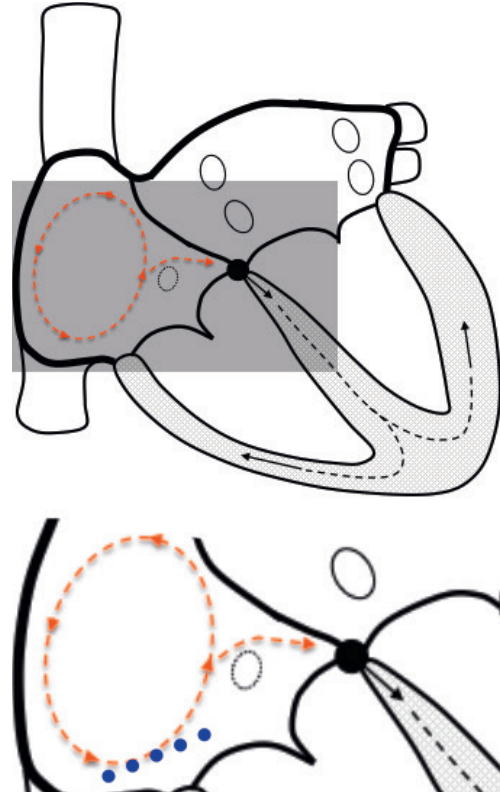
The benefit of having a catheter ablation for SVT is that it may cure the heart rhythm disturbance completely and prevent the need to take medication to control palpitations and associated symptoms.

Risks

- Groin bleeding/vascular damage 1% (1/100)
- Need for permanent pacemaker 1% (1/100)
- Pericardial effusion (bleeding around the heart) 0.2% (1/500)
- Stroke 0.1% (1/1000)

The procedure typically takes 2 hours.

Typical Atrial Flutter



The electrical impulses in typical atrial flutter are organised and follow a defined circuit around the right top chamber. Ablation across a section of the circuit blocks the electrical impulse and prevents it from recurring.

The **success rate** of atrial flutter ablation at Royal Papworth Hospital is considered to be **95%** with a single procedure.

Benefits

The benefit of having a catheter ablation for atrial flutter is that it may cure the heart rhythm disturbance completely and prevent the need to take medication to control palpitations and associated symptoms. Some patients who have had successful ablation for typical atrial flutter can later develop atrial fibrillation (AF).

Risks

- Groin bleeding/vascular damage 1% (1/100)
- Need for permanent pacemaker <1% (1/100)
- Pericardial effusion (bleeding around the heart) 0.2% (1/500)

The procedure typically takes 2 hours.

Atypical Atrial Flutter and Atrial Tachycardia

The electrical impulses in atypical atrial flutter and atrial tachycardia may take a less well-defined circuit or arise from an abnormal focus in the top chambers. It is necessary then to first identify (map) the abnormal circuit or location of abnormal impulses before determining the area for ablation.

The **success rate** of ablation of these types of arrhythmias at Royal Papworth Hospital is considered to be **80 to 90%** with a single procedure. However, the ability to ablate certain types of arrhythmia is dependent upon your heart arrhythmia being triggered on the day.

Benefits

The benefit of having a catheter ablation for atrial arrhythmias is that it may cure the heart rhythm disturbance completely and prevent the need to take medication to control palpitations and associated symptoms.

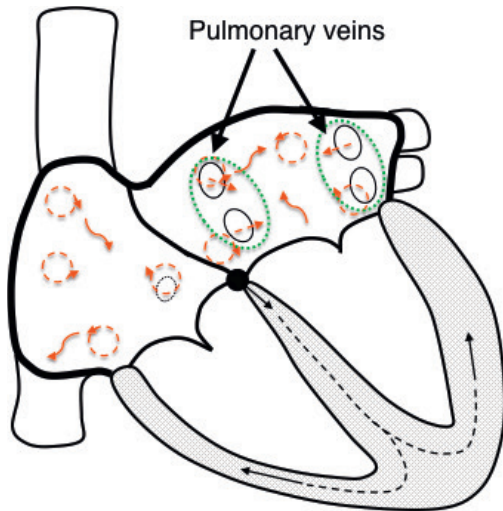
Risks

- Groin bleeding/vascular damage 1% (1/100)
- Need for permanent pacemaker <1% (1/100)
- Stroke <1% (1/100)
- Pericardial effusion (bleeding around the heart) 0.2% (1/500)

The procedure typically takes 2-3 hours.

Atrial Fibrillation

The abnormal electrical activity in AF is triggered and sustained from openings in the left atrium where the pulmonary veins return blood from the lungs. Hundreds of abnormal impulses occur in a random and chaotic manner, bombing the AV node continuously.



The AV node allows as many impulses as possible to go through to the ventricles but there is no pattern to this which causes the ventricles to pump in an irregular manner. This rhythm may cause symptoms including palpitations, fatigue and breathlessness. This is when AF ablation may be of benefit.

AF classification:

Paroxysmal AF - starts/stops spontaneously

Persistent AF - does not stop spontaneously

Permanent AF - continues despite treatment

Catheter ablation for AF involves electrically isolating the pulmonary veins from the surrounding atrial. Pulmonary vein isolation (PVI) is the procedure used for an AF ablation and the two terms are often interchanged.

There are several techniques used to achieve PVI. Single closely spaced ablations, continuous lines created by ablation or freezing are used depending on several factors which will be discussed prior to your procedure. PVI does not stop the abnormal impulses occurring, but the aim is to block them with a line of scar tissue in order to stop them stimulating the rest of the heart.

Usually AADs are continued unless you are instructed to stop them. It is very important to follow instructions regarding your anticoagulant (blood thinning) medication carefully as failing to do so may delay your ablation procedure.

The **success rate** of AF ablation at Royal Papworth Hospital is considered to be **60 to 65%** with a single procedure. The success rate following a second procedure is **80%**.

Benefits

The benefit of having a catheter ablation for atrial fibrillation is that it may control the heart rhythm disturbance and prevent the need to take medication to control palpitations and associated symptoms.

Risks

- Groin bleeding/vascular damage 1% (1/100)
- Stroke 1% (1/100)
- Pericardial effusion (bleeding around the heart) 1-2% (1/50)
- Phrenic nerve injury 2% (1/50)
- Pulmonary vein narrowing <1% (1/100)
- Atrio-oesophageal fistula (hole between heart and gullet) 0.1% (1/1000)
- Death 0.05% (1/2000)

The procedure typically takes 3 hours.

Premature Ventricular Contractions

Premature Ventricular Contractions (PVCs) or ventricular ectopics are spontaneous extra beats arising from the bottom chambers of the heart. They are most often completely safe and do not need any specific treatment. However, if they occur in sufficient numbers they can cause uncomfortable symptoms and in rare occasions impair the overall function of the heart. In these situations, ablation may be recommended.

It is necessary to first identify (map) the location of the abnormal impulses responsible for the extra beats which then can be targeted with ablation.

The **success rate** of ablation of these extra beats at Royal Papworth Hospital is considered to be **80%** with a single procedure. However, the ability to ablate them is dependent on their frequency at the time of ablation to allow accurate mapping.

Benefits

The benefit of having a catheter ablation for PVCs is that it may cure the heart rhythm disturbance completely and prevent the need to take medication to control palpitations and associated symptoms. In addition, any impairment of heart function may improve.

Risks

- Groin bleeding/vascular damage 1% (1/100)
- Pericardial effusion (bleeding around the heart) 1% (1/100)
- Stroke 0.1% (1/1000)
- Heart attack <0.1% (1/1000)

The procedure typically takes 2-3 hours.

Ventricular Tachycardia

Ventricular tachycardia (VT) can occur in patients with inherited cardiac conditions or as a result of scarring caused by heart attacks (ischaemic heart disease). As these arrhythmias can be dangerous, patients may have an Implantable Cardioverter Defibrillator (ICD) to treat episodes of VT when it occurs. In some situations, catheter ablation may be recommended to prevent episodes occurring in the first place.

The **success rate** of ablation for ventricular tachycardia at Royal Papworth Hospital will depend on the underlying cause but is considered to be **80-90%** with a single procedure.

Benefits

The benefit of having a VT ablation procedure is that it should stop the ectopic beats or very rapid heart rhythms. You may be able to discontinue the drugs used to control your heart rhythm. If you have an ICD you are likely to have less frequent therapies from the ICD.

Risks

The exact risks may vary depending on the type of VT that you have. Additional risks apply if epicardial access is needed.

- Groin bleeding/vascular damage 1% (1/100)
- Pericardial effusion (bleeding around the heart) 2% (1/50)
- Stroke 1% (1/100)
- Heart attack 1% (1/100)
- Need for permanent pacemaker <1% (1/100)
- Death <1% (1/100)

Risks of epicardial access:

- Pericardial effusion (bleeding around the heart) 10% (1/10)
- Intra-abdominal bleeding <1% (1/100)
- Liver laceration <1% (1/100)

The procedure typically takes 3-4 hours.

Further help and advice

If you have questions, concerns or are having on-going symptoms please contact the **Arrhythmia Specialist Nurse (ASN) help line** on **01223 638947**.

Arrhythmia Alliance - the heart rhythm charity

PO Box 3697
Stratford-Upon-Avon
Warwickshire
CV37 8YL

24hr Helpline: 01789 450787

Email: info@heartrhythmcharity.org.uk
www.heartrhythmcharity.org.uk

The British Heart Foundation

BHF
Greater London House
180 Hampstead Road
London NW1 7AW

Heart Helpline: 0300 330 3311

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DVLA

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