



**University Hospitals Birmingham**  
NHS Foundation Trust



# Ventricular Stimulation Study

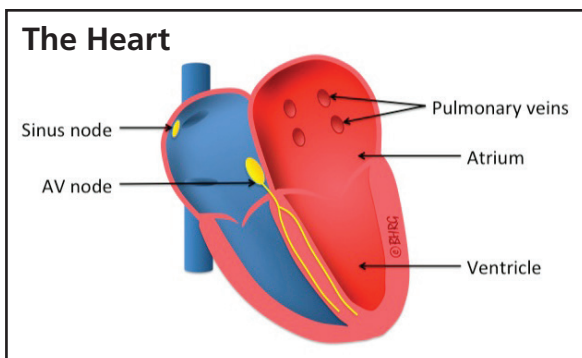
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## About this patient information leaflet

This patient information leaflet is about a test for ventricular tachycardia, one of the main heart rhythm problems we treat. It is one of a series of leaflets that we have produced, written in everyday language that explains what a particular heart rhythm condition is, what its symptoms are, why it occurs and how it is treated.

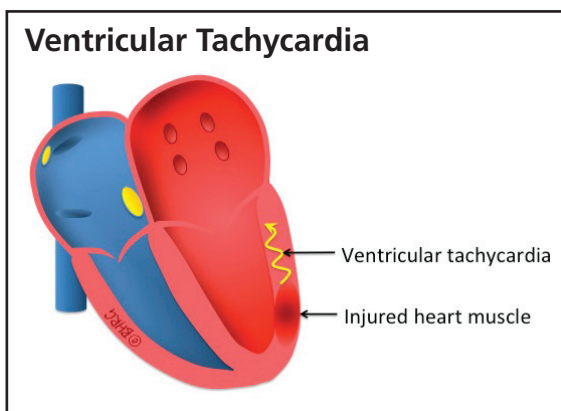


This booklet has been prepared for individuals preparing to undergo one of the procedures described or for individuals looking for more information about these procedures. The information provided within this booklet does not replace the consultation that takes place between the patient and the doctor.

## Ventricular tachycardia stimulation study

### What is ventricular tachycardia?

Ventricular tachycardia (VT) is an abnormal and rapid heart rhythm. VT affects the main pumping chambers of the heart (called ventricles). The healthy heart has its own electrical system responsible for controlling the heart rhythm and heart rate.



When this electrical system is not functioning properly, VT can

occur. If the VT is very fast, the heart will be unable to pump enough blood to circulate in the body and keep the blood pressure high enough. In some cases this may lead to a loss of consciousness. If the heart has previously been damaged, for example by a heart attack, infection or heart failure, then the VT could cause death.

### **What is a ventricular tachycardia stimulation study?**

A VT stimulation study is a test that investigates the electrical system of the heart. The aim of the test is to try and start VT in the heart. VT that can be started is an indication that an individual would be at risk of VT starting spontaneously in the future.

### **What does a ventricular tachycardia stimulation study involve?**

The procedure involves passing one or two long fine wires (called catheters) into the heart via the blood vessels. Strong sedatives and local anaesthetic are used to make it comfortable and virtually painless. The procedure is performed as a keyhole operation through small punctures in the skin of the groin. Once in the heart, the catheter ends are placed in contact with the heart muscle. We will then try to start VT in the heart while you are sleeping. The VT stimulation study is positive if VT can be started.

### **Who benefits from having a ventricular tachycardia stimulation study?**

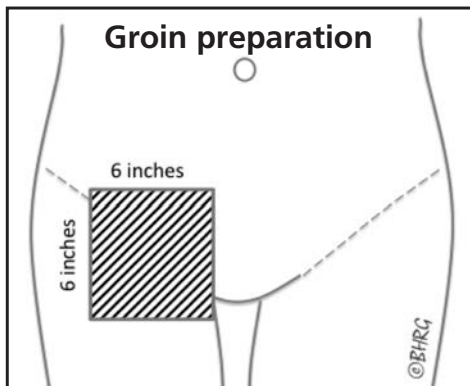
Some individuals have a higher chance of developing VT. The outcome of the VT stimulation test will determine whether an individual would benefit from treatment for VT. This treatment often involves taking medication or having a defibrillator pacemaker (ICD) inserted.

### **What happens before the procedure?**

Once you have decided to have VT stimulation study, your cardiologist will explain the procedure to you in detail, go through the potential risks and answer all your questions.

During the week prior to your scheduled procedure you will be asked to attend a pre-admission clinic at the Queen Elizabeth Hospital. At this visit you will be asked what medication you are taking, your heart will be examined briefly and blood tests will be done. You will be given further instructions in preparation for your procedure and you will have the opportunity to ask any questions. This is also a good time to inform the medical team of any of your allergies.

On the day before your procedure it is helpful if you can prepare the right groin area by carefully shaving an area of about 15cm x 15cm (6in x 6in) as in the diagram. If you are unable to do this then we will do it either beforehand on the ward or at the time of the procedure.



### **What happens on the day of my procedure?**

Please take your medication on the morning as you would normally at home unless we have specifically asked you not to take certain drugs. On the day of your procedure you should go to the Ambulatory Care Ward unless your appointment letter has requested you go to a different ward. We ask you to be there early, usually between 07:30 and 08:00. If you have not previously signed the consent form then you will have the opportunity to read it and ask questions before you sign it.

Unless you have been instructed differently, please ensure that you do not eat anything after 04:00 on the morning of your procedure. You may drink water up to 06:00.

Once you are at your bed and changed into a hospital gown, a small cannula (or tube) will be inserted into the back of your hand or arm veins. This is used to administer the sedative and any other medication needed before, during and after the procedure. Blood for tests will be taken.

We are unable to give you an exact time your procedure will start as procedures are undertaken throughout the day and we cannot predict how long each will take. Although you may be admitted in the morning, you might only have your procedure in the afternoon. The team on the ward will keep you updated while you wait for your procedure.

### **What happens at the start of my procedure?**

A nurse or doctor will come and fetch you from the ward and either walk with you or take you on your bed to the operating room. You will notice that the theatre has large-scale X-ray equipment and many computer screens that are used for the procedure. The theatre staff will introduce themselves and help you onto the operating table. Usually a nurse, a radiographer, a cardiac physiologist and one or two doctors are present in the room with you. When you are lying down you will be attached to a heart monitoring system (ECG).

The nurse will begin to give you the pain control medication and sedation using the cannula in your arm. An oxygen mask will be placed over your mouth and nose. The skin over the top of the right leg where you shaved will be exposed and cleaned with alcohol fluid. A sheet will be draped over you which will cover you from the neck to your feet and only the small shaved area will be exposed. Local anaesthetic will be injected into your right groin as the sedative begins to take effect. The nurse will remain with you throughout the procedure ensuring that you are as comfortable as possible. You will more than likely sleep through most of the procedure following the sedation that was given to you.

Once your skin in the groin is numb, tiny punctures will be made with a needle into your vein to allow the insertion and movement of the catheters up into the heart under X-ray guidance. When all the wires are positioned in the heart, we will attempt to start up a VT. If VT begins then we will stop it after about 30 seconds. We can stop it either using the catheters or by giving you an electrical shock across the chest. You will not feel the jolt as you are asleep. We will continue to check that you are

free from pain at regular intervals during the procedure.

When the test is complete, the catheters will be withdrawn from the heart and removed from the groin. It is at this stage that you may start to wake up and feel us putting gentle pressure on the groin. This is done for a few minutes to stop the bleeding. When the bleeding has stopped a small plaster will be placed over the puncture sites. From this point onwards we ask that you lie on your back for a few hours and avoid bending your legs, particularly the right leg as the groin punctures may still bleed. We will help you move back onto your bed from the operating table by sliding you on a sheet so that you don't need to bend your leg.

### **What happens after the procedure?**

You will be returned to the ward where you were admitted. It is possible that you may not remember anything from the operating room and might only wake up fully when you are back on the ward. This is normal. The person who accompanied you to the hospital can visit you as soon as you get back to the ward. You may feel sleepy for the rest of the evening as the sedative continues to wear off. We can give you more pain relief medication if you have any pain.

Once you are back on the ward you should lie on your back for 2 hours and after this, if there is no bleeding from the groin, we will allow you to sit up for a further 2 hours. If all has gone well you will be able to walk 4 hours after the procedure. You can drink water (through a straw) within the first hour after the procedure and then you can eat and have other drinks after that as long as you are not too drowsy.

During the first 4 hours after the procedure you will be attached to a heart monitor and regular checks of your blood pressure and groin will be carried out. Your doctor will come and talk to you about the outcome of your procedure and check your recovery.

You will be able to go home the same day or the following

morning after your procedure if you are well enough to be discharged. A discharge letter with an updated list of your medication will be given to you to take to the GP. We will give you a supply of any new medication. One of the nursing team will discuss your medication with you again before you leave. We will make arrangements for a follow up consultation.

## What can I expect when I go home?

### What happens when I go home?

Once you get home you can go about your normal routine but there are a number of activities that should be avoided after your procedure to allow the puncture sites to heal.

- Avoid lifting heavy objects for 7 days
- Avoid rigorous exercise for 5 days. We suggest walking if you wish to exercise
- The DVLA recommends that you do not drive for 2 days
- You should not fly within 7 days

You can have a bath or shower the day after you get home. Most people are back to work within a week (it depends upon what job you do and how strenuous it is) and most are back to all their normal activities within 2 weeks.

### What symptoms should make me seek urgent medical help?

If you experience any of the following then we urge you to contact your local hospital or GP:

- Increased swelling, pain or bleeding from the groin
- Increased shortness of breath
- Severe chest pain

If these occur you may need to be admitted to hospital for tests and observation. Your local hospital or GP should be able to deal with these in the first instance. If you get admitted to another hospital we would be very happy to give any advice to the doctors that are treating you at the time and we encourage them to contact our team to let us know what has happened to you.

## What are the possible complications of a ventricular stimulation study?

Although the ventricular stimulation test can be considered a “keyhole” procedure, it involves the heart and unfortunately, sometimes things can go wrong. Common complications are not dangerous but can be uncomfortable for a period of time. Dangerous complications are rare. If something goes wrong you may need to stay in hospital for a few more days.

### Common but not dangerous complications

#### **Pain**

The groin area where the punctures were made can be painful after the procedure. Pain in the centre of the chest is very rare and disappears after the catheters are removed. Usually this is adequately controlled by the pain relief medication given to you before and during the procedure. Pain in the groin area after the test can be controlled with paracetamol or anti-inflammatory medication such as ibuprofen.

#### **Bleeding (haemorrhage)**

A small amount of blood oozing from the groin immediately after the test is common. Very rarely when the bleeding takes a little longer to stop we may need to push on the groin to stop the bleeding. By the time you are discharged the bleeding should have stopped.

#### **Groin bruising and swelling (haematoma)**

A small bruise may develop around the puncture sites. The bruise may increase in size after you have been discharged and form a pea-sized lump in the groin. It may take up to 3 weeks to improve or disappear and the bruising may change colour as time passes, usually to green and yellow. If you are worried about your bruise then contact your GP who will be able to advise you.



## **Allergic reactions (anaphylaxis)**

During the procedure some patients may develop a rash from the medication or from the monitoring stickers that have been placed on the skin. If this happens then we can give you medication during the procedure to counteract the allergic reaction.

## **Uncommon but more serious complications**

### **Groin problems (haematoma and false aneurysm)**

In about 1 in 500 (0.2%) of cases there is more bleeding than we would expect in the groin at the site of the punctures. We may need to place tight bandages or a pressure clamp to control the bleeding until it stops. This may be because the anticoagulation medication is causing the blood to take longer to clot or because the artery next to the vein was inadvertently punctured. The bleeding may also spread under the skin and form a blood clot making a lump under the skin. Very rarely an operation, in less than 1 in 1000 (0.1%) cases, is needed to repair the blood vessels in the groin. Although these groin problems are noticed and treated before you go home, a swelling can occur once you are back home. You will need to be seen by a doctor should this happen.

### **Blood around the heart (pericardial effusion)**

Rarely blood leaks out of the heart through a puncture made by one of the catheters. The blood accumulates around the heart. If the puncture does not seal off spontaneously and the blood leak is large then the blood must be removed. A thin tube is introduced through the skin in the front of the chest using local anaesthetic and placed near the heart to drain the accumulated blood. This drain can be removed 24 to 48 hours later. Should we recognise that blood has leaked out during the test we will insert the drain while you are asleep.

Occasionally the blood leak is noticed later when you are back on the ward and a drain will be inserted then. The risk of

needing a drain around the heart is about 1 in 1000 (0.1%).

## **Death**

The risk of dying from this test or from one of the above complications is less than 1 in 1000 (0.1%). Although all the complications can be treated, in very rare cases the treatment may not be successful.

## **Making comments or complaints**

We hope that you have no cause for complaint during your stay at the Queen Elizabeth Hospital, however, should you have any problems please do not hesitate to tell the nurse, and we will try to resolve the matter there and then.

Alternatively, the Patient Advice and Liaison Service (PALS) will be happy to resolve any problems, concerns or complaints that you might have. The contact details for PALS are printed at the end of this booklet.



## How to contact us

### Queen Elizabeth Hospital Birmingham

Ambulatory Care Ward	0121 371 3115 0121 371 3125
Ward 304	0121 371 3049
Patient Advice and Liaison Service (PALS)	0121 371 3280
Cardiology Booking Clerk	0121 371 4037

## Where can I get more information?

Arrhythmia Alliance	<a href="http://www.arrythmiaalliance.org.uk">www.arrythmiaalliance.org.uk</a>
Atrial Fibrillation Association	<a href="http://www.afa.org.uk">www.afa.org.uk</a>
The British Heart Foundation	<a href="http://www.bhf.org.uk">www.bhf.org.uk</a>
Age UK	<a href="http://www.ageuk.org.uk">www.ageuk.org.uk</a>
British Cardiac Patients Association	<a href="http://www.bcpa.co.uk">www.bcpa.co.uk</a>
DVLA Medical Enquiries	0300 790 6806 (car, motorcycle) 0300 790 6807 (bus, coach, lorry) 0845 850 0095 (fax)



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