

Royal Brompton Hospital

# Having a right heart catheter

to test for pulmonary  
hypertension





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This leaflet provides information about having a right heart catheter (RHC) procedure to test for pulmonary hypertension. RHC is also known as cardiac catheterisation. This leaflet does not replace personal advice from a healthcare professional. If you have any questions please ask your doctor or nurse.

## What is a right heart catheter (RHC)?

A right heart catheter (RHC) is a test performed in a cardiac catheterisation laboratory (cath lab) using X-ray images. It is the most accurate way of diagnosing different types of pulmonary hypertension.

Pulmonary hypertension (PH) is a rare heart and lung condition where the pressure in the pulmonary arteries is higher than normal. The pulmonary arteries are major blood vessels that carry blood from the heart to the lungs.

With an RHC procedure, we can:

1. See how well the heart is pumping
2. Measure the amount of oxygen and blood pressures inside the heart and lung blood vessels (pulmonary arteries).

RHC can also be used to test for other medical conditions.


## What happens during RHC?

During the procedure long thin tubes are inserted into a vein (blood vessel) usually in your right arm. The first tube called a sheath is inserted into the vein to keep it open.

Through this tube, we pass another long thin tube called a catheter with special sensors on the tip to take the measurements we need. The catheter is guided directly into your heart using X-ray images.

The procedure is carried out under local anaesthetic so you will be awake. The local anaesthetic is used to numb the area of the skin around the vein being used for the procedure.

The procedure is painless. People having this procedure do not usually even feel the tubes moving through their arm and heart.



Sometimes people ask for a medicine called a sedative to make them feel more relaxed during the procedure. However, we cannot give sedatives for RHC because this type of medicine may affect the pressure readings we need to take.

We may perform other tests while you are in the cath lab for your RHC. We will usually discuss these tests with you before you come into hospital for your RHC (see page 8).

## How is RHC performed?

RHC usually takes around an hour and is carried out by a team that includes a doctor, nurses, a radiographer and a cardiac physiologist. During the procedure members of our team will explain what's happening.

In the cath lab you will lie flat on a special table and be covered in a sterile sheet.

A doctor will do an ultrasound scan to find a vein to use for the procedure. The vein is usually in the right arm, but sometimes in the upper thigh (groin) or neck (see picture on page 5). The skin around the vein is cleaned and may be shaved.

We will give you an injection of local anaesthetic to numb the area around the vein.

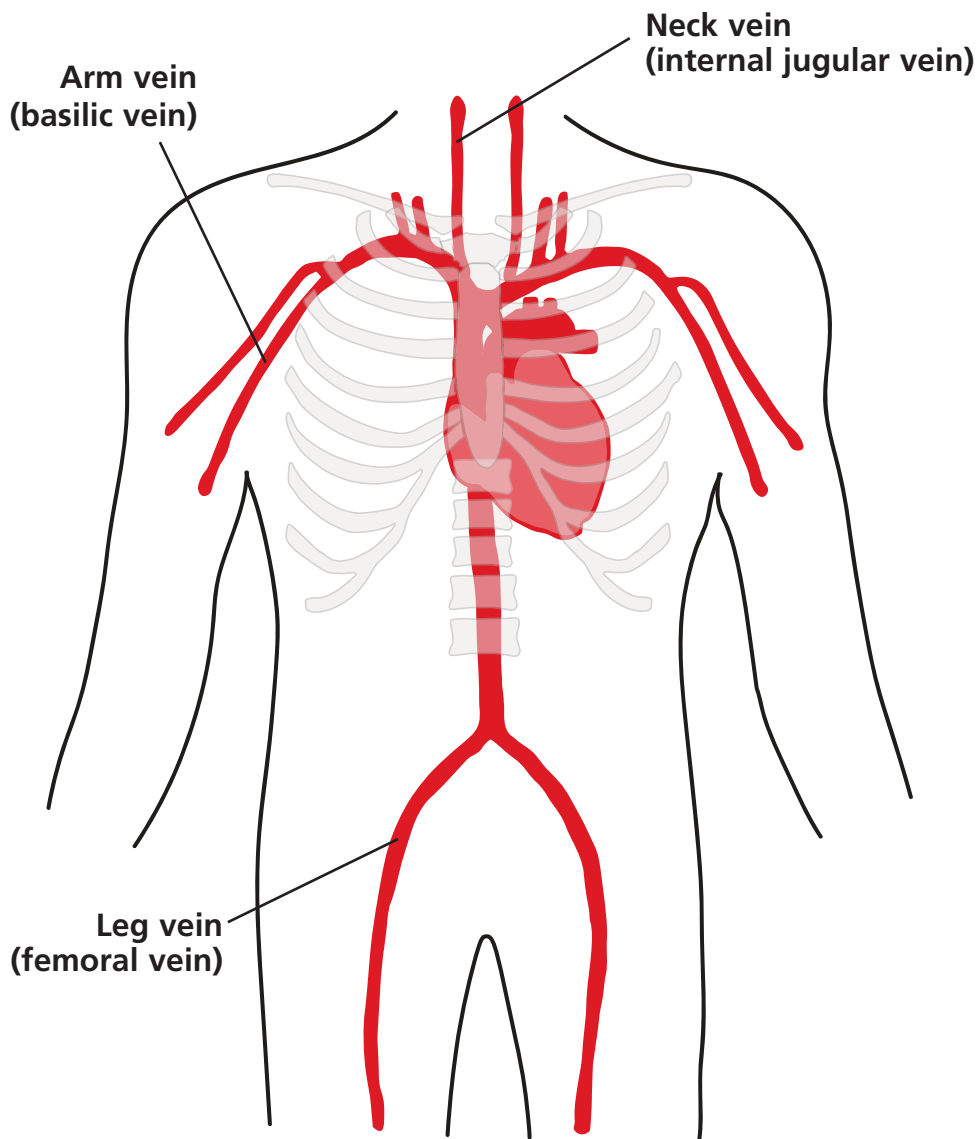
A small cut (incision) will be made into the vein. Using an ultrasound scan as a guide, a sheath will be inserted into the vein to keep it open during the procedure.

Through this tube, we will pass a catheter that goes directly into your heart using X-ray images as a guide.

Special sensors at the tip of the catheter allow the doctor to take measurements inside your heart and large blood vessels of your lungs. You may be asked to take some deep breaths at times during the procedure.

Once the RHC is completed, the catheter and sheath will be removed. A dressing will be put over the small cut in your vein and you will return to the ward to recover.

One of the veins shown in the picture below will be used for your RHC.





## Benefits and risks of RHC

Every procedure carries some risk and risks are different for each person. Your doctor will discuss the risks with you before you decide to go ahead with an RHC.

### Benefits

RHC will help your doctor to tell if you have pulmonary hypertension or if your symptoms are caused by something else. It may also help us to decide on the best treatment for your condition.

### Risks of an RHC

#### Common (1 in 100 people)


- Minor bleeding from the vein when the catheter is removed. Bleeding is controlled by applying firm pressure.
- Minor bruising caused by the insertion of the catheter. The bruising usually disappears in a few days.
- Difficulty passing the catheter into the vein. If this happens, we will try to use a different vein for the procedure.
- Feeling hot and flushed with reddening of the face and other parts of the body. This only lasts a few seconds.
- Back pain usually caused by lying down in a flat position during the procedure.
- Numbness around the vein where the catheter is inserted. This happens because local anaesthetic is used to numb the area. The numbness usually disappears after around 20 minutes.
- Feeling faint which is caused by a drop in blood pressure and heart rate. Feeling faint is treated by lowering the head of the bed, or raising your feet, and giving medicines. Intravenous fluids (fluids given straight into a vein) may also be given to increase the heart rate and raise the blood pressure.

## Uncommon (1 in 500 people)

- Irregular heartbeat (arrhythmia) that continues for a longer time. This can be treated with medicine, or an electrical shock may be used to restore the heart's normal rhythm.
- Allergic reaction to medicines or materials being used. Allergic reactions may need to be treated with intravenous medicines.
- Air bubbles may enter the vein during the procedure and escape into the lungs. This causes pain and reduces the oxygen levels in the lungs which may make you feel breathless. We will give you painkillers and oxygen.
- A collapsed lung. This is only a risk if a catheter is inserted into a neck vein. A collapsed lung happens when air leaks into the space between your lung and chest wall. The air pushes on the outside of your lung making it collapse. We may need to insert a chest tube between your ribs to remove the air.
- Damage to an artery which leads to bleeding. An artery is a blood vessel but is different from a vein. One of the key differences is that blood flows faster through an artery than a vein. This quicker blood flow means that damage to an artery can be more serious than from a vein. Usually, firm pressure is all that is needed to control bleeding from an artery. However, rarely, a separate procedure may be needed to correct the damage.

## Rare (1 in 1,000 people)

- Damage to the lung blood vessels. We will give you painkillers and oxygen, and treat any bleeding that occurs.
- A build-up of fluid around the heart that affects its ability to pump. This is called a cardiac tamponade and requires emergency treatment. A needle and catheter are used to drain the fluid from around the heart.

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- Stroke – this is a life-threatening condition that happens when the blood supply to part of the brain is cut off. It is treated with medicines to restore the blood supply.
  - Infection to the area where the catheter was inserted. Antibiotics may be needed to treat this.
  - Death during an RHC procedure.

## **Alternative tests and treatments**

We can carry out alternative tests, but they are not as accurate as RHC in diagnosing pulmonary hypertension. We can use some medicines, but without an RHC there are medicines we cannot prescribe for you.

## **Choosing no treatment**

If you choose not to have treatment, your condition may get worse.

## **Other tests we may perform**

We may carry out other tests when you come into the cath lab for your RHC. If this happens, each test will be carefully explained to you.

The other tests include:

### **Coronary angiogram**

A coronary angiogram is also known as an angiogram or cardiac catheterisation. This test looks at the main arteries (coronary arteries), which supply the heart with blood and oxygen. It will show the exact location and seriousness of any narrowed areas in your coronary arteries using X-ray images.

### **Vasoreactivity testing**

In some types of pulmonary hypertension, we perform this procedure to find if we can give you a type of medicine called a



calcium channel blocker. You will be asked to inhale a gas called nitric oxide through a mask for up to 10 minutes to see if it reduces the pressures in your lungs. Vasoreactivity testing is also sometimes called a reversibility study.

## **Pulmonary angiogram**

This is a test to look at the vessels of the lungs. A special dye (contrast agent) is injected into the pulmonary arteries. The dye shows up any narrowed areas or blockages in your arteries using X-ray images. You will be asked to hold your breath during parts of the procedure.

## **Before your RHC**

### **Pre-admission appointment**

The week before the procedure, you will have a pre-admission appointment. This is carried out by phone. One of our clinical nurse specialists will discuss your medical history and the medicines you are taking.

### **Pre-assessment appointment**


The week or weekend before the procedure we may ask you to attend a pre-assessment appointment at the hospital to have blood tests.

## **Preparing to come into hospital**

### **What to bring to hospital?**

**You may need to stay overnight so please bring:**

- any forms we have asked you to complete
- oxygen and devices - continuous positive airway pressure (CPAP) or and non-invasive ventilation (NIV)
- a dressing gown
- slippers that fit well and have good grip

- 
- your washbag with toiletries, such as a toothbrush and toothpaste
  - something to read

## Valuables

We recommend that you do not bring any valuables or large sums of money with you.

## Medicines

Please bring your medicines in their original boxes with you to the hospital on the day of your procedure. Follow the instructions given at your pre-assessment appointment about any medicines that can or cannot be taken on the morning of the procedure.

You should also have received specific instructions if you take:

- blood thinners, such as warfarin, Edoxaban, Dabigatran, Apixaban or Rivaroxaban
- diabetic medicines
- or PH medicines

If you have any questions about your medicines or your RHC please contact the PH clinical nurse specialists helpline:

Phone **020 7352 8121** extension **82156** (Monday to Friday, 9am to 5pm).

## On the day of your RHC

Do not eat anything after 12 midnight on the day of your procedure.

You can drink water, black tea, or black coffee until 6am on the day of your procedure, unless a doctor or a nurse has asked you not to drink it.

You can have sips of water on the ward until it is time to go to the cath lab.

## Arriving at the hospital

Go to the main reception where the receptionist will direct you to your ward.

### On the ward

On the day of your admission, you will meet a nurse who will prepare you for the procedure. You will have some blood tests and a cannula (small plastic tube) inserted in your hand or arm. This is so we can give you medicines or fluids during the procedure, if needed.

We try to keep waiting times for procedures to a minimum, but sometimes there are delays when other patients need to be seen in an emergency. We will keep you informed of any changes.

You will be asked to change into a hospital gown and to remove all jewellery. There is no need to remove a hearing aid or dentures.

## After your RHC

Your treatment after the procedure depends on the vein used for the catheter:

- If the vein is in the arm or neck – a tight dressing will be applied for 30 minutes. During this time, you will be closely monitored in the day unit or a ward. This dressing will be removed before you leave hospital, and another small dressing will be applied.
- If the vein is in the groin – we will ask you to lie down flat and rest on a bed for up to 4 hours.

Before you leave hospital, your doctor will explain when you are able to return to your usual activities.



## Food and drink

We give you a light lunch and a hot drink after your procedure.

## Your results

The results of the test will be reviewed by your medical team before you leave hospital. We will discuss the results with you, and explain if you need to change any of your medicines.

We will also discuss your results in a multidisciplinary team (MDT) meeting which is usually the day after the test. An MDT is a group of healthcare professionals who plan and manage your care. The team includes doctors, nurses and pharmacists.

We will talk about your results and decide the best treatment plan for you. We will then explain the treatment plan in a letter to you, or you will receive a call from your consultant.

## Hospital transport

If you need hospital transport to get to us, please ask your GP to arrange it.

We also have a section on our website about transport:

[www.rbht.nhs.uk/patients-visitors/for-patients/non-emergency-hospital-transport-for-patients](http://www.rbht.nhs.uk/patients-visitors/for-patients/non-emergency-hospital-transport-for-patients).

And a leaflet about 'Getting help with travel costs when coming to hospital' on this section of our website:

[www.rbht.nhs.uk/patients-visitors/visitors/locations](http://www.rbht.nhs.uk/patients-visitors/visitors/locations).

## Contact us

Please contact the PH team if you have any questions.

Royal Brompton Hospital switchboard **020 7352 8121**

PH secretary **extension 88362**  
(Monday to Friday, 9am to 5pm)

PH scheduler **extension 88618**  
(Monday to Friday, 9am to 5pm)

PH clinical nurse specialists **extension 82156**  
(Monday to Friday, 9am to 5pm)  
email: **[gstt.phnurses@nhs.net](mailto:gstt.phnurses@nhs.net)**



## Your notes

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If you have concerns about any aspect of the service you have received in hospital and feel unable to talk to those people responsible for your care, call the Patient Advice and Liaison Service (PALS) on:

- Royal Brompton Hospital – 020 7349 7715
- Harefield Hospital – 01895 826 572

Or email [gstt.rbhh-pals@nhs.net](mailto:gstt.rbhh-pals@nhs.net). This is a confidential service.



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Sydney Street  
London  
SW3 6NP  
Phone: 0330 12 88121

Harefield Hospital  
Hill End Road  
Harefield  
Middlesex  
UB9 6JH  
Phone: 0330 12 88121

Website: [www.rbht.nhs.uk](http://www.rbht.nhs.uk)

Royal Brompton and Harefield hospitals are part of Guy's and St Thomas' NHS Foundation Trust

إذا كنت ترغب في الحصول على ترجمة فورية لمضمون هذه الوثيقة إلى اللغة العربية، يرجى منك الاتصال بأحد مستخدمينا بجناح المصلحة التي يتم فيها استشفائك. أحد موظفينا سيسعى لترتيب إجراءات الترجمة وإتمامها في الوقت المناسب لك.

Brosurteki bilginin Türkçe tercumesi için tedavi görüyor olduğunuz bölüme bas vurunuz. Bölüm personeli tercümenin gerçekleşmesini en kısa zamanda ayarlayacaktır.

