

# Angiogram and angioplasty – image guided

## Information for patients

This leaflet explains angiogram and angioplasty. It covers what to expect on the day of the procedure, as well as the benefits, the possible risks and the alternatives.

Before the angiogram/angioplasty, a clinical staff member will explain the procedure to you in detail. This leaflet is not meant to replace that discussion. If you have any questions or concerns, please do not hesitate to talk to the doctors or nurses who are caring for you. It is important that you feel well informed before agreeing to the procedure and signing the consent form.

### Confirming your identity

Before you have a treatment or procedure, our staff will ask you your name and date of birth and check your ID band. If you do not have an ID band we will also ask you to confirm your address. If we do not ask these questions, then please ask us to check. Ensuring your safety is our primary concern.

### What is an angiogram?

An angiogram (or arteriogram) involves having a dye (contrast) injected into one of your arteries (blood vessels). The dye shows up on x-ray imaging and provides a map of your blood vessels, showing where the narrowing or blockages are.

Image guided means that we will use images from ultrasound scans and real time x-ray (fluoroscopy) to identify the location of the narrowing or blockages in your artery.

### What is angioplasty?

It is used to treat a narrowed or blocked artery without the need for major surgery. We put a **thin plastic tube (catheter)** into the artery and pass it through the blockage. Next we put in a special balloon, which we inflate for a few moments to stretch the narrowed area and improve the blood flow. We then deflate the balloon and take it out.

Sometimes you instead have a small, tubular-shaped wire mesh (**stent**) placed in the artery to help keep it open. This will remain in place permanently.

## Why do I need this procedure?

Your doctor has found a narrowing or blockage in one of your arteries that is causing you a problem. The narrowing/blockage leads to poor blood flow in your legs, which causes pain when walking (claudication) or possibly even when you are resting. If you do not have a good blood supply in your leg it may be more prone to infection and wounds will not heal as well.

You usually have a Doppler ultrasound or a computed tomography (CT) scan before this procedure to assess the extent of the narrowing of your artery.

The doctors in charge of your case and an Interventional Radiologist have discussed your condition and think the angioplasty is your best treatment option.

## What are the risks?

Angiogram and angioplasty are safe procedures. However, there are risks and possible complications with all procedures, even though every effort is made to prevent them.

- **Bleeding at the puncture (needle-entry) site:** You may have a small bruise after the procedure but this usually fades in a week or two. Fewer than 3% of the patients need treatment for a groin problem caused by the procedure. Some bruises can be large enough to need treatment. Very rarely, surgery is needed to repair the artery.
- **Damage to the artery in your groin:** A tender lump called a false aneurysm (pseudoaneurysm) may develop in the few days after your surgery if blood leaks from the puncture site. We can find it with an ultrasound scan and treat it with an injection to clot the blood.
- **Worsening of a pre-existing kidney problem due to dye (contrast):** Your doctors will minimise the risk of this happening. If you are not on dialysis but your kidney function is quite poor, we advise you to drink plenty of fluids before and after the procedure. You may also need a fluid drip that you will be given through a plastic tube inserted in a vein in your hand or arm.
- **Unsuccessful placement of the closure device in your groin:** A plug or stitch is often used to seal the artery after the procedure. If this fails, the doctor will apply pressure in your groin and you will have to lie flat in the bed for four hours. Rarely the plug can block the artery if it moves elsewhere. If this happens, you will need surgery to remove it.
- **Allergic Reaction to the dye (contrast):** This is rare. Fewer than one in every 1,000 patients has a severe reaction to the dye.
- **Radiation risk:** In order to be performed safely, your procedure requires to be performed under x-ray guidance. X-rays are a type of ionising radiation. Studies have shown that people who have been exposed to high doses of ionising radiation have an increased chance of developing cancer many years or decades after they have been exposed. However, while more complex or difficult cases

might require a slightly higher radiation dose, the radiation exposure associated with this procedure is moderate. It is the assessment of your doctor and the radiology doctor who will be performing the procedure that the benefit of the procedure outweighs the risk from the exposure to radiation. The specialist radiologist and radiographer will ensure that your radiation exposure is kept as low as possible during the procedure. If you have any concerns about the risk of exposure to radiation during this procedure, you can discuss this further during the consent process with the radiologist who will be performing your procedure. Please notify the clinical team if you think you may be pregnant.

## **What are the benefits?**

Angiogram and angioplasty with or without stent insertion are minimally invasive procedures which do not involve surgery. Because they are less invasive, there are less risks than with traditional surgery. You also recover more quickly and have less chance of infection.

## **Are there any alternatives?**

- You can have medical or surgical treatment that aims to manage the symptoms. You may be offered a bypass procedure, if you are suitable. You can also have conservative treatment options which include generalised lifestyle improvements such as healthy eating, weight loss, an increase in exercise, minimising stress if possible, smoking cessation and taking any medicines to control cholesterol, blood pressure, diabetes, and to stop blood clotting (if applicable).

## **Consent**

We must by law obtain your written consent to any operation and some other procedures, including an angiogram/angioplasty beforehand. Staff will explain all the risks, benefits and alternatives before they ask you to sign a consent form. If you are unsure about any aspect of this procedure, please do not hesitate to ask to speak with a senior member of staff again. We will inform your GP that you have had this procedure, unless you specifically instruct us not to.

## **Where will I have the procedure?**

You will have it at one of two places:

- Interventional Radiology Department, 1st Floor Denmark Wing, King's College Hospital (KCH), Denmark Hill; or
- Interventional Radiology Department, 1<sup>st</sup> Floor South Wing, Princess Royal University Hospital (PRUH).

## **How can I prepare for the procedure?**

**Pre-assessment appointment:** We will arrange for you to have a pre-assessment appointment, either in person or by phone. You will be asked questions about yourself, your health and the medications you take. A blood sample will also be taken

to check that you are in good general health and how well your blood clots. You usually have the blood test in our department at either King's College Hospital or the PRUH, but sometimes you may have it taken at your local GP.

If your procedure is at the Denmark Hill site, IR nurses may perform a STOP-BANG, Conscious Sedation Assessment and other needed assessments if sedation or GA is needed. If you pass all assessments, sedation or GA may be offered even for a day case. However, if you fail the assessments but still wish for sedation or GA, you'll be referred to an Anaesthetic Consultant for review. They will determine whether sedation or GA can be provided as a Day Case or if inpatient admission is required before the procedure.

After your pre-assessment, we will arrange a date and time for your procedure. We usually let you know the appointment details the same day as your pre-assessment.

**Drugs and alcohol:** Do not use any recreational drugs or drink alcohol for 24 hours before the angioplasty.

**Medications:** Please make sure the doctor or nurse knows if you are diabetic and are taking tablets such as metformin or insulin injections.

Also inform them if you are taking any of the following blood-thinning medications (anticoagulants): aspirin, clopidogrel, warfarin, apixaban, rivaroxaban, edoxaban, ticagrelor, prasugrel, phenprocoumon, acenocoumarol, dagibatran, argatroban, heparins, fondaparinux, enoxaparin.

They will tell you when to stop these medications and when it is safe to start taking them again.

If in doubt, please bring with you all the medications that you are taking, whether they have been prescribed for you or you have bought them over the counter at your local chemist store.

## **What type of anaesthesia will I have?**

You usually have local anaesthetic. This means you will be awake during the procedure but will not feel pain in the area being treated. If you pass the STOP-BANG and Conscious Sedation Assessment, which you will have at your pre-assessment appointment or when you arrive at the IR department before your procedure, you will be able to have sedation as well as the local anaesthesia.

Sometimes, the procedure may require general anaesthesia, meaning you will be asleep. If you have general anaesthesia, you will usually be admitted to the hospital. However, if you meet the necessary criteria for a Day Case GA, you may be able to undergo the procedure as a day case patient.

## **Will I be admitted to hospital for the angiogram/angioplasty?**

You will have your procedure either as a day case patient or a TCI patient. We explain what this means below. We will let you know which one applies to you:

**Day case patient:** You will have the angiogram/angioplasty in the morning and, if everything is normal and you are stable, you will be discharged home later in the day. Please arrive at Interventional Radiology at 8am so you can be admitted to the unit.

**To come in (TCI) patient:** You will be admitted to the hospital the day before your procedure and stay overnight before your procedure. Rarely, you may be admitted on the morning of your procedure. The bed manager will call you to let you know when to arrive and which ward to go to for your admission.

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

### **Eating and drinking:**

- **Day Case** – Have a light breakfast at about 5am but do not eat anything after this time. You can drink clear fluids (water, black tea, black coffee) up to **two hours** before your procedure. If you are for sedation or general anaesthetics (GA), please follow the TCI instruction below.
- **TCI** – You **must not** eat anything for at least **six hours** before your procedure (especially if you are having general anaesthesia). You can drink clear fluids (water, black tea, black coffee) up to **two hours** beforehand. This means we will be able to offer you sedation if needed and if you pass the sedation assessments.

**Medications:** Keep taking your regular medications, except for any blood-thinning ones (unless instructed otherwise). Remember to take your blood pressure medication on the morning of the procedure (if applicable). If your blood pressure is too high on the day of the procedure, you might need to have it on another day.

**What to bring with you:** Please bring all your medications on their original packaging and something to read.

**What not to bring with you:** Do not bring valuables, jewellery or large sums of money with you. If this unavoidable, please ask a relative or friend to take them home for you. The hospital cannot accept liability for the loss of items that are not handed in for safekeeping.

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

A small, thin tube called a cannula will be put into a vein in your hand or arm so we can give you medications such as pain relief if you need them during or after the angioplasty.

If your kidney function is poor and you are not on dialysis, you will be given fluid through this cannula before and after the procedure.

If you are diabetic and on insulin injections, you may also need a fluid drip in your vein to regulate your blood sugar once you are fasting.

## **What happens during the procedure?**

An Interventional Radiologist – a specialist doctor trained in image-guided procedures who will carry out your procedure – will explain the procedure to you and ask for your consent. They will be assisted by interventional radiology nurse(s) and a radiographer who operates the special x-ray machine inside the procedure room.

You will be taken to the angiography suite or procedure room and asked to lie flat on your back on a special x-ray table.

We will attach you to a monitoring device to check your heart rate, breathing, oxygen level and blood pressure.

We will ask you to confirm your details before the start of the procedure and the doctor doing the procedure will confirm the procedure plan with the specialist team.

The skin in your groin or wrist (whichever is suitable) will be cleaned with disinfectant and the doctor will use an ultrasound machine to guide the needle and give you a local anaesthetic. You might feel a brief sting before the area gets numb.

They will make a small cut so they can put a needle into the artery in your groin, followed by a thin wire. They will use x-ray images to check they have the wire in the correct position. The doctor will then take out the needle and place a thin plastic tube (sheath) over the wire to secure the access site and insert a thin plastic tube (catheter) towards the narrowed or blocked artery that needs to be treated using x-ray images to guide them. The doctor will inject a dye to make sure the catheter is in the correct place. You may feel a warm sensation for a few seconds when the dye is injected. You may also feel the need to pass urine or have a metallic taste in your mouth. These are all normal.

Once the doctor has found the area that needs treating, they will put in another catheter that includes a very small balloon. They inflate the balloon to widen the narrowed or blocked artery to help your blood to flow normally. You may feel some discomfort when the balloon is inflated, but this should ease once it is deflated.

Your doctor may also use a special balloon coated with medicine which transfers to your artery wall. The drug stays behind after the balloon is taken out and helps prevent the artery from narrowing again.

They may also put in a stent to ensure your artery is opened up as much as possible. You may need this if the balloon treatment alone does not give a good enough result.

More x-rays will be taken and once the doctor is satisfied that your artery has been widened, they will close the access hole in the artery of your groin or wrist with a special closure device. If they cannot place the device or it is not suitable for you, the doctor will apply a firm pressure above the skin entry point for 10 to 15 minutes to prevent any bleeding.

## **Will the procedure hurt?**

It may sting a little when the local anaesthetic is injected. Occasionally, when the balloon is inflated, you may feel a dull ache or pressure, but this goes away when the balloon is deflated.

You might find the position the doctor asks you to lie in uncomfortable for a short while. If you have any pain or discomfort, tell our nursing staff and they will give you some painkillers and or sedation (if applicable) and help make you more comfortable.

## **How long does the procedure take?**

It usually takes about one – two hours. However, on some occasions it could be longer than that.

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

You may have a vascular closure device to help close the puncture site and reduce the risk of bleeding. If that does not work, pressure will be applied to the puncture site for at least 15 minutes. The area will then be covered with a plastic film dressing.

You will be taken to the recovery area, where the nursing staff will monitor you, to make sure there are no complications. They will regularly check your puncture site for signs of bleeding, swelling or infection. They will also check the pulse in your foot or arm.

## **When can I go home?**

**If you have been admitted to hospital:** If there are no complications, you may be discharged the day after the procedure

**If you are a day case patient:** If there are no complications, you will be able to go home later in the afternoon on the day of your procedure

**Remember, you will not be able to drive yourself home after the procedure, so make sure someone can accompany you. Important: A responsible adult must collect you from the hospital and take you home by car or taxi (not public transport). Alternatively, you can go home via hospital transport which you or the vascular department has discussed and pre-booked. You must not drive any vehicle for 24 hours after the procedure and you must make sure you feel well enough to drive after that time. A responsible adult must also stay with you overnight after the procedure.**

## **How do I care for the cut?**

**Keep the** puncture site dry for two days. You can have a shower. Take the dressing off your groin before you shower and gently clean the area with soap and water. Dry thoroughly and put on a small plaster. Do not use powder or body lotion on the puncture site. Do not take a bath or go swimming for one week.

## **When can I exercise and go back to work?**

Relax and take it easy for 24 hours after the procedure. You can resume normal everyday activities after 48 hours but avoid heavy lifting, contact sports and strenuous exercise such as gardening for at least a week. Drink plenty of fluids, unless otherwise instructed by your doctor.

## **When can I start taking blood thinners again?**

If you take anticoagulants, your clinical team will let you know when it is ok to start taking them again if you stopped them before your procedure. You may need some changes to your medication after the procedure to help keep the artery open. Your doctor will let you know if this is the case.

## **What should I look out for after the procedure?**

If there are problems after the procedure, they usually happen while you are still in hospital.

You should expect tenderness at the puncture site for one week, mild oozing, bruising that could last for two weeks or a small lump which may last up to six weeks.

You are likely to have some mild discomfort. You may take your regular pain medication to ease this.

Call 999 or go to your nearest Accident & Emergency (A&E) Department if you have any of the following:

- significant bleeding from the puncture site (press firmly over the puncture site)
- increased swelling or unusual pain in your groin or leg
- numbness or coldness in your foot.
- discolouration or a 'white foot'.

## **What should I do if I cannot come for my appointment?**

Please let us know as soon as possible so we can arrange another date and time. This also enables us to offer your appointment time to someone else.

King's College Hospital Denmark Hill, tel: **020 3299 3490, 020 3299 6730 or 020 3299 3280**

Princess Royal University Hospital, tel: **01689 863671**

## **Who can I contact with queries or concerns?**

If you have any questions about your procedure, please contact one of the following, Monday to Friday, 9am – 5pm:

- KCH Vascular Clinical Nurse Specialist, Denmark Hill, tel: **020 3299 7596**
- PRUH Vascular Clinical Nurse Specialist, tel: **01689 864868**
- KCH, tel: **020 3299 3490, 020 3299 2060**
- PRUH, tel: **01689 863671**



## More information and support

- King's College Hospital: [www.kch.nhs.uk](http://www.kch.nhs.uk)
- NHS: [www.nhs.uk](http://www.nhs.uk), tel: 111
- British Society of Interventional Radiology: [www.bsir.org](http://www.bsir.org) (click on Patients, click on patient information leaflets, select leaflet)

## Care provided by students

We provide clinical training where our students get practical experience by treating patients. Please tell your doctor or nurse if you do not want students to be involved in your care. Your treatment will not be affected by your decision.

## MyChart

Our MyChart app and website lets you securely access parts of your health record with us, giving you more control over your care. Visit [www.kch.nhs.uk/mychart](http://www.kch.nhs.uk/mychart) to find out more.

## Sharing your information

King's College Hospital NHS Foundation Trust has partnered with Guy's and St Thomas' NHS Foundation Trust through the King's Health Partners Academic Health Sciences Centre. We are working together to give our patients the best possible care, so you might find we invite you for appointments at Guy's or St Thomas' hospitals. King's College Hospital and Guy's and St Thomas' NHS Foundation Trusts share an electronic patient record system, which means information about your health record can be accessed safely and securely by health and care staff at both Trusts. For more information visit [www.kch.nhs.uk](http://www.kch.nhs.uk).

## Care provided by students

We provide clinical training where our students get practical experience by treating patients. Please tell your doctor or nurse if you do not want students to be involved in your care. Your treatment will not be affected by your decision.

## PALS

The Patient Advice and Liaison Service (PALS) is a service that offers support, information and assistance to patients, relatives and visitors. They can also provide help and advice if you have a concern or complaint that staff have not been able to resolve for you. They can also pass on praise or thanks to our teams.

Tel: **020 3299 4618**

Email: [kings.pals@nhs.net](mailto:kings.pals@nhs.net)

**If you would like the information in this leaflet in a different language or format, please contact our Interpreting and Accessible Communication Support on 020 3299 4618 or email [kings.access@nhs.net](mailto:kings.access@nhs.net)**

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