

Elective Coronary Angioplasty and Stent Insertion

Cardiology Directorate

Introduction

This leaflet has been designed to give you information about an angioplasty and stent insertion procedure, undertaken on patients at the Heart and Lung Centre, New Cross Hospital.

It will help you to understand what will happen to you, explain the possible risks of the procedure, explain other alternatives if you do not wish to go ahead with the procedure, and ensure that you know as much as possible about the procedure before you agree to it and sign the consent form.

This leaflet should be read in conjunction with the leaflet about Coronary Angiography.

The procedure is recommended by National Institute for Health and Clinical Excellence (NICE) guidance. On occasions, during the procedure of angioplasty and stent insertion, imaging of the vessel using ultrasound (IVUS) or optical coherence tomography (OCT) may be performed using a catheter similar to a balloon catheter. IVUS is a well-established technique with evidence to support its use. OCT gives much more high definition pictures but currently is less well validated. According to NICE, OCT is a safe procedure but there is not much evidence about how well it works. If it is recommended to you, please discuss the benefits and risks of the procedure with the clinician before agreeing to undergo it.

What is coronary angioplasty and stent implantation?

Angioplasty is a procedure in which a catheter guided balloon is passed over a fine wire to open up a blocked artery. The balloon is inflated in the narrowed area and the pressure flattens the blockage against the walls of the artery. A stent may then be inserted.

A stent is a wire mesh tube which is placed at the narrowed section of the artery and expands to hold the artery open. It comes in different sizes to match the size of your artery.

Because it is mesh-like, the cells lining your blood vessel grow around it and help secure it. Angioplasty has now become the first choice of treatment for heart attack and patients who present with angina due to blocked or narrow arteries. It is a very common procedure; over 90,000 are performed in the UK each year. It may be performed as an emergency or as a planned procedure.

The aim of the procedure is to restore or increase blood flow to the heart muscle by opening up the artery. It is performed in a cardiac catheter laboratory under local anaesthetic and sedation. It involves passing a long thin catheter (tube) with a balloon or stent along your main artery (aorta) into your heart and coronary artery.

The prevention of infection is a major priority in all healthcare and everyone has a part to play.

- **Please decontaminate your hands frequently for 20 seconds using soap and water or alcohol gel if available**
- **If you have symptoms of diarrhoea and/or vomiting, cough or other respiratory symptoms, a temperature or any loss of taste or smell please do not visit the hospital or any other care facility and seek advice from 111**
- **Keep the environment clean and tidy**
- **Let's work together to keep infections out of our hospitals and care homes.**

We can access this from the artery in the wrist (radially) or sometimes we may use the artery in your leg (femorally). Using the radial artery allows easier earlier mobilisation after the procedure.

What preparation is needed?

- You should have nothing to eat for 4 hours and nothing to drink for 2 hours before the procedure
- Be sure to take all your normal medication for that morning with a small sip of water. This particularly applies to Aspirin and Clopidogrel (Plavix) if you take these regularly. Exceptions to this are if you are diabetic on tablets or insulin, or taking warfarin / phenindione, or one of the newer anticoagulants: please follow special instructions under the medication section
- Please bring all your medication with you in their original containers.

Why do I need to have this procedure?

Your Doctor has recommended this treatment because the inside walls of the main arteries to your heart are narrowed due to a build-up of fatty materials known as atheroma. If these progress they will block the artery.

If there is a tight narrowing you will experience pain (angina) on exercise or even at rest. This comes from the heart muscle being starved of blood and therefore oxygen. If your pain is becoming more frequent or not responding to medication, the next step is to open up these narrow areas by angioplasty and stent implantation. In the setting of an acute heart attack the artery may be completely blocked. This can be relieved with emergency angioplasty.

What are the risks and benefits?

The majority of procedures result in a successful outcome; current rates run at over 90%. The procedure is very safe but cannot be performed without an element of risk. Complications can occur in 2-3 of 100 cases. They vary with each person; generally risks are greater if the procedure is performed as an emergency, or complex coronary blockages are treated.

Risks:

- Bleeding and bruising at the groin or arm is common; rarely this may require a blood transfusion or an operation to seal the artery at the access site
- Emergency coronary artery (bypass surgery) is required because of damage to a major coronary artery in less than 1 in 200 cases
- The repaired artery may re-narrow (restenosis). New developments in stent technology and medication are reducing the risk of this and in most cases it can be reversed by repeating the procedure
- Development of an abnormal heart beat in less than 1 in 500 cases, which may require treatment with drugs or electrical treatment
- Adverse reactions to the X-ray dye or to drugs used during the procedure
- The risks for procedures involving a high radiation dose will be explained to you before the procedure and as part of the consent process
- Stroke; this occurs in less than 1 in 500 cases
- Myocardial infarction (heart attack) occurs in 2 in 100 cases
- Death; this is a rare but potential complication occurring in less than 1 in 100 cases. This incidence reduces if the procedure is performed as a non-emergency procedure
- Initially a long thin guide wire has to be passed through the narrowing. Occasionally the wire cannot penetrate if the area is very bendy or hardened. If this happens, the procedure cannot continue, as the wire provides the guide for the balloon and stent catheters.

Benefits:

- Balloon angioplasty and stent insertion is less invasive than an operation, undertaken to increase the blood flow to the heart called a coronary artery bypass surgery or 'bypass'. Coronary artery bypass surgery is a procedure performed under a general anaesthetic. The surgeon cuts the breast bone in order to get to the surface of the heart. Segments of veins from one or both legs and/or a blood vessel which runs behind the rib cage are then used to bypass the narrowings in the arteries which supply blood to the heart. The long term outcome of the two procedures is very similar. Risks of serious complications are lower in certain groups of patients
- The procedure is performed using local anaesthetic and sedation. No general anaesthetic is required
- No surgical incision is needed, only a small puncture hole in the leg or arm, therefore no stitches are required
- After a successful outcome you will be able to return to your normal activities, and most patients will feel the benefit immediately.

What alternatives are there if I choose not to have coronary angioplasty?

If you choose not to have this procedure you will continue to have symptoms. The alternatives are to continue taking tablets (medical therapy) or possibly to have coronary artery bypass surgery.

If your Doctor has recommended coronary angioplasty (s)he will explain to you the reasons for this and your options if you choose not to have this procedure. Please take this opportunity to ask questions and discuss any concerns you may have.

Please Note: Even after a successful procedure you may need to continue on tablets to keep your blood thin (antiplatelets) and to prevent your arteries from narrowing again.

Before the procedure:

- Preparation will begin with the Nurse and Doctor asking you a series of questions about your general state of health and assessing your fitness for the procedure
- A Doctor / Nurse will ask you to confirm your consent. This is a good opportunity for further discussion around your procedure
- Please tell us before the procedure if there is any possibility you may be pregnant, as we would want to avoid any exposure to X-rays
- Please advise us if you have any known allergies
- You will be fitted with a wristband with accurate details about you on it. It ensures that staff can identify you correctly and give you the right care. It is important that you do not remove it until you go home
- You will have blood tests, a repeat heart tracing, and a small plastic tube (cannula) inserted into a vein in your arm so that intravenous drugs can be given
- We will provide you with a gown and disposable paper pants to wear during the procedure. You will need to remove all your clothing, jewellery (except wedding ring, if you wish) and make-up, including nail varnish
- If necessary, the Nurse will shave any excess hair at the site of insertion of the catheter (top of the leg or wrist)
- The Doctor will prescribe aspirin, if you are not already taking it, and another antiplatelet drug to take prior to the procedure. This will reduce the risk of clots forming around the stent afterwards. Platelets are tiny particles in the blood and are the body's first step in forming clots as part of the healing process

- The order in which patients have their procedure during the day is based on clinical need and also on any life threatening emergency cases that may be admitted during the day. Patients often arrive together first thing but will be spread out during the day. The staff will give you an idea of where on the list you are.

Medications:

What to do if you are diabetic or take warfarin/phenindione or one of the newer anticoagulants?

- If your diabetes is diet controlled, do not have anything to eat for 4 hours prior to the procedure and nothing to drink for 2 hours prior to the procedure
- If you take tablets to control your diabetes do not take them if you are not having breakfast. You may take them after your procedure with food
- If your procedure is in the afternoon and you are having breakfast, take your normal tablets
- If you normally take metformin tablets, do not take them on the day of the procedure and for a period of 48 hours following the procedure.

Diabetics on insulin should follow these instructions:

- If your procedure is in the morning: do not have any breakfast and do not take your usual morning insulin. We will try to ensure you are first on the list and you will be offered food and your usual morning insulin after the procedure
- If your procedure is in the afternoon: take half of your morning dose of mixed insulin (minimum 10 units) with breakfast. If you take insulin four times a day please take your usual morning dose.

If you take warfarin or phenindione or one of the newer anticoagulants (NOAC's) for example, dabigatran, rivaroxaban, apixaban or edoxaban you should be informed individually what to do. If you are unsure, please contact your consultant's secretary or the cardiology day ward.

Usually, warfarin is stopped 2 to 3 days before the procedure but please check as this is not always appropriate. Patients with artificial heart valves may need to continue warfarin and have the procedure from the artery at the wrist.

What happens during the procedure?

- If you have had a previous coronary angiogram you will be familiar with the first part of the procedure as it is very similar
- Throughout the procedure you will be lying on your back with your head supported on a well-padded table. If this makes you short of breath we can give you oxygen. Both the table and X-ray equipment will move at times to take different views when the Doctor is injecting dye into your arteries
- Sticky electrodes are applied to your chest to monitor your heart rhythm and rate; a probe attached to your finger records your oxygen levels
- The top of your leg or lower arm will be cleaned with antiseptic solution and you will be covered in a sterile drape with a small 'window' positioned at the insertion site
- The Nurse will administer intravenous sedation to help you to relax, this may make you a little drowsy
- An injection of local anaesthetic will be given to the top of the leg or lower arm. You may feel a sharp scratch and a stinging sensation, but this will pass quickly. A small plastic tube (sheath) is then inserted into the artery to enable the catheters to pass smoothly

- You will be given a drug called heparin via this tube to thin your blood and to prevent clots developing during the procedure. The Doctor will then pass a catheter through the sheath into your coronary artery. A dye is injected so that the narrow area can be seen on an X-ray image
- If the wire is successfully positioned, a catheter with a balloon is threaded over the wire, advanced into the narrow area and then inflated for several seconds. It may need more than one inflation. This may give you chest discomfort as we are stopping the blood flowing to your heart muscle; it is temporary and will go when the balloon is deflated. If the discomfort continues, please tell us, we can give you pain relief
- The pressure from the inflated balloon widens the artery, increasing blood flow. In the majority of cases a stent is inserted into the artery, to reduce the chance of the arteries closing again
- The stent is mounted on a balloon catheter and positioned in the narrow area. When the balloon inflates it expands the mesh tube against the artery wall. The tube remains in place when the balloon is deflated. This may be performed in several different areas if required, so the length of the procedure may vary from one to two hours
- Occasionally some patients experience chest discomfort during or after the procedure. Please tell us if this happens so we can give you pain relief or other drugs to relieve your symptoms
- You may need an infusion intravenously of an antiplatelet drug for twelve hours after the procedure. This prevents your blood becoming sticky and blocking the stent
- When the procedure is complete you will be transferred to the ward for observation and recovery
- Pressure Wire Assessment - sometimes further invasive assessment of the severity of the narrowings is needed prior to stenting. This is done in a similar way with a wire that has a pressure measuring tip. This is passed into the vessel in the same way as an angioplasty wire
- Additional techniques - sometimes the area of narrowing is too tight or stiff due to calcification to allow passage of the balloon or its expansion. In this situation a number of other options may be recommended:
 1. Rotational atherectomy - this uses a spinning 'burr' that is placed over the wire to help disrupt calcification in the artery allowing balloon passage. This is a commonly used technique but does increase slightly the risk of the procedure because the burr spins at high speed. Without it however it is unlikely that the angioplasty could be successfully completed.
 2. Intravascular lithotripsy - this is a technique where a special balloon is passed into the tight area and ultrasound shockwaves are used to 'crack' the resistant calcification in the wall of the vessel allowing balloon expansion and stent delivery.

The purpose of these additional techniques is to get the very best stent result which is important in the longer term. If these techniques are recommended for you, we will discuss them before the procedure.

What happens after the procedure?

- Your blood pressure, pulse, and puncture site will be checked at regular intervals. You will be attached to a monitor to observe your heart rhythm
- Radial puncture sites have a wrist band put on them; you can sit up immediately
- If your leg puncture hole has been sealed with a special device (angioseal) you will be able to sit up immediately providing bleeding and bruising is not a problem; antiplatelet drugs can increase your tendency to bleed or bruise
- If your puncture site has not been sealed, you will have to remain flat for 3 to 4 hours until the Heparin to thin your blood is out of your system. The sheath can then be removed by the nursing staff. You will be given pain relief and a drug to speed up your heart rate. The Nurse will remove the sheath by pulling and will then place pressure on the puncture site either with fingers or a mechanical device for about 15 minutes. You will need to lie flat for another hour following this

- You can eat and drink, once you feel able. Fluids are encouraged to rid your body of the dye used for X-rays
- You will be given antiplatelet tablets to take in addition to your regular medication, and these will be prescribed for several months; do not stop taking them without consulting your heart specialist
- Before you go home, the Doctor will review all your medication and discuss any changes that may be necessary.

When can I go home and what advice should I follow?

In most cases, following the procedure patients can go home the same day. It is therefore important that you have the company of a responsible adult overnight and access to a telephone line (land or mobile). If this is not possible, please inform the waiting list clerk on 01902 694064 before the day of your procedure. Occasionally an overnight stay is required.

You will need someone to drive you home, you should not drive for 1 week after your procedure.

If you hold a PSV or HGV driving licence you will be disqualified from driving these vehicles for at least 6 weeks. Re-licensing may be permitted thereafter, provided that the exercise test requirement can be met and there is no other disqualifying condition. Our rehabilitation team will discuss this with you and arrange the exercise test.

For more information, the DVLA contact details are at the back of this booklet.

- After an uncomplicated angioplasty procedure it is advised that you should not fly in an aircraft for 2 days
- Gradually increase your activity over the next few days. Do not stand for long periods. Do not lift anything heavy or do manual work for 1 week, it may need to be longer if you have excessive bruising and swelling
- You should avoid soaking in a hot bath for 24 hours as this may disturb the plug that has formed in your puncture site. You can have a warm shower or wash in warm water
- Remove your dressing after 24 hours. A further dressing should not be required; if there is any discharge from the puncture site, contact your GP
- Bruising may be confined to a small area or extend as far as your knee and may take several weeks to disappear. If you have had the procedure radially, your wrist may be bruised. Any bruising or discomfort should ease within a few days. If you notice your puncture site is hard, swollen, red or warm to touch, or if you develop a fever, contact your GP or contact us on the telephone numbers given at the end of the leaflet, so we can advise you
- If your puncture site starts to ooze a small amount of blood, lie or sit down and apply pressure for five to ten minutes. If slight oozing continues call your GP. If the bleeding is heavy and forceful (this is unusual), press hard over the puncture site, call for an ambulance and explain that you have had coronary angioplasty
- If you experience any severe chest pains lasting for more than 10-15 minutes unrelieved by the spray that you use under your tongue (GTN), call an ambulance
- If a closure device (angioseal) has been used at your puncture site please carry the information card given to you for 90 days, after which time the plug will have dissolved. You should avoid further puncture at the same site during these 90 days
- If you are diabetic and take metformin please do not take it for 48 hours after your procedure, to allow time for your kidneys to excrete the dye used for X-ray
- If you have stopped your warfarin or one of the newest anticoagulants, you will usually restart it the day after your procedure or follow your Doctor's instructions.

For those patients who have had a radial procedure (via the wrist), in addition to the above:

- Avoid heavy lifting, pulling, pushing with the affected arm for 1 week
- If your hand becomes cold or numb, or your fingers become blue contact your GP for advice. Alternatively contact the hospital on the numbers on the next pages.

How to contact us

Cardiac Catheter Suite

Third Floor
Wolverhampton Heart and Lung Centre
New Cross Hospital
Wolverhampton
West Midlands
WV10 0QP
Telephone 01902 694273

If you have any additional questions/comments or if you need to telephone for advice or information following your discharge, please do not hesitate to contact us using the numbers below:

Cardiology Wards: 01902 694330 / 694223

Waiting List Clerk on 01902 694064

Additional information is available from:

Wolverhampton Coronary Aftercare Support Group (WCASG)

Heart and Lung Centre,
New Cross Hospital,
Wolverhampton.
Email: WCASG79@gmail.com
Tel: 01902 755695 Mobile: 07889 063647
Website: www.have-a-heart.net

Patient Liaison Service (PALS)

New Cross Hospital
Tel: 01902 695362. Mobile: 07880 601085
Pager: 1463 (Dial 01902 307999 and ask the switchboard operator to connect you to the pager).
Email: rwh-tr.pals@nhs.net

Age Concern Wolverhampton

Supportive discharge service for anyone aged 50 or over, based in New Cross Hospital.
Tel: 01902 695517 or 07753 718929

British Cardiac Patient Association

15 Abbey Road
Bingham
Nottingham
NG13 8EE
Email: admin@bcpa.co.uk
National Helpline: 01223 846845
Website: www.bcpa.co.uk

British Heart Foundation

Greater London House
180 Hampstead Road
London
NW1 7AW
Tel: 0845 070 8070
Website: www.bhf.org.uk

DVLA

Drivers Medical Group
DVLA
Swansea
SA99 1TU
Tel: 0870 600 0301 (08:15 to 16:30 Monday to Friday)
Website: www.dvla.gov.uk

English

If you need information in another way like easy read or a different language please let us know.

If you need an interpreter or assistance please let us know.

Lithuanian

Jeigu norėtumėte, kad informacija jums būtų pateikta kitu būdu, pavyzdžiui, supaprastinta forma ar kita kalba, prašome mums apie tai pranešti.

Jeigu jums reikia vertėjo ar kitos pagalbos, prašome mums apie tai pranešti.

Polish

Jeżeli chcieliby Państwo otrzymać te informacje w innej postaci, na przykład w wersji łatwej do czytania lub w innym języku, prosimy powiedzieć nam o tym.

Prosimy poinformować nas również, jeżeli potrzebowaliby Państwo usługi tłumaczenia ustnego lub innej pomocy.

Punjabi

ਜੇ ਤੁਹਾਨੂੰ ਇਹ ਜਾਣਕਾਰੀ ਕਿਸੇ ਹੋਰ ਰੂਪ ਵਿਚ, ਜਿਵੇਂ ਪੜ੍ਹਨ ਵਿਚ ਆਸਾਨ ਰੂਪ ਜਾਂ ਕਿਸੇ ਦੂਜੀ ਭਾਸ਼ਾ ਵਿਚ, ਚਾਹੀਦੀ ਹੈ ਤਾਂ ਕਿਰਪਾ ਕਰਕੇ ਸਾਨੂੰ ਦੱਸੋ।

ਜੇ ਤੁਹਾਨੂੰ ਦੁਭਾਸ਼ੀਏ ਦੀ ਜਾਂ ਸਹਾਇਤਾ ਦੀ ਲੋੜ ਹੈ ਤਾਂ ਕਿਰਪਾ ਕਰਕੇ ਸਾਨੂੰ ਦੱਸੋ।

Romanian

Dacă aveți nevoie de informații în alt format, ca de exemplu caractere ușor de citit sau altă limbă, vă rugăm să ne informați.

Dacă aveți nevoie de un interpret sau de asistență, vă rugăm să ne informați.

Traditional Chinese

如果您需要以其他方式了解信息，如易读或其他语种，请告诉我们。

如果您需要口译人员或帮助，请告诉我们。