

Coronary Angioplasty and Stent (PCI - Percutaneous Coronary Intervention)

An information guide



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What is angina?

A coronary angiogram is an x-ray image of the blood vessels using an x-ray contrast (dye) and x-ray equipment. Angina happens because the coronary arteries can gradually become narrowed by a build up of fatty material. This is called atherosclerosis and the fatty material is called atheroma.

What should I do if I get angina?

If you get angina you must stop what you are doing. Sit down and rest and use your GTN (glyceryl trinitrate) spray or tablets.

The GTN relaxes your blood vessels and allows more blood to flow to the heart, but it also lowers your blood pressure and you might feel dizzy. Some people get a headache when using GTN. You must always be seated when using GTN.

If you get angina; a chest tightness, heaviness, or ache which sometimes spreads to the neck, jaw, back or stomach. You need to:

- Stop, sit down and have 2 puffs of the GTN under your tongue, wait five minutes for it to ease.
- If it is not relieved, have 2 more puffs of the GTN under your tongue, wait five minutes for it to ease.
- If it is not relieved, have 2 puffs of the GTN under your tongue, wait five minutes for it to ease. If it is not eased after five minutes telephone 999 to call an ambulance, do not drive yourself.

How does the doctor find out that I need PCI?

A coronary angiogram is an x-ray picture of the blood vessels using an x-ray (contrast) 'dye'. It shows if the coronary arteries have any atheroma ('furring up') which can narrow the artery. You are awake during the angiogram and usually takes about 30 minutes to complete. An angiogram will show if an artery has narrowed and by how much. From these results the doctor will decide what the best plan of care is.

The plan of care may consider an alternative cause for symptoms, medication management, PCI, surgery, or to gain more information from other heart tests. Some cases are discussed later in the multi-disciplinary team meeting (MDT), with consultant cardiologists, some who specialise in PCI and also cardiovascular surgeons, who perform coronary artery bypass graft surgery.

Patients may have an angiogram and PCI at the same time.

What is angioplasty and stent?

Angioplasty is a procedure in which a small balloon is briefly inflated and then deflated in the coronary artery, to stretch the artery and squash the atheroma (furring up) in the artery to the wall of the artery.

Stent – a stent is a fine metal framework that is inserted into the stretched area of the artery to keep it open and ensure that the blood supply through the artery is maintained.

The use of the balloon and stent is called PCI (percutaneous coronary intervention). This is done using a local anaesthetic.

The PCI procedure is similar to the angiogram procedure; the same x-ray equipment and dye are used, PCI takes longer than the angiogram and in some cases may take over an hour. The doctor may use an artery in the groin or the wrist to go through to the heart arteries.

Can you have PCI for a heart attack?

Some people have PCI immediately as part of the treatment for a heart attack. You may be taken directly in the ambulance you called from home to a hospital that does PCI. Others who have had a heart attack may be transferred to another hospital for a PCI during their stay.

After recovery from your heart attack in hospital you will be contacted by the cardiac nurses from your local Pennine Acute Hospital, or local cardiac rehabilitation provider. You will be invited to an appointment with them, and may be able to attend a cardiac rehabilitation class.

What should I bring into hospital?

You will get a letter through the post with the date and time you need to come to hospital.

Please remember to bring with you:

- All your tablets, and any other medications in their original boxes, including inhalers if you are prescribed them.
- Some comfortable clothes for the day.
- Nightwear, toiletries, slippers or indoor shoes if you have them and anything else you might need to stay overnight.

Please leave all your valuables safely at home.

Can I do anything to prepare for coming into hospital?

- Keep as active as your angina allows, always have your GTN spray with you and remember to use it if needed
- Stock up with shopping and food that is easy to prepare during your recovery. Remember you are not to carry any shopping for five days after the PCI
- Before coming in, have a bath or shower and put on freshly washed clothes, remove any nail varnish
- Stop smoking, it's still not too late.

You may need to take a total of 600mg of clopidogrel tablets and 300mg of aspirin the night before you have the procedure, to make sure that your blood is thin enough to do the procedure.

Can I have visitors on Ward 1?

No, we ask that you are dropped off at ward 1. The ward has limited space and can be a very busy area. Your family may telephone the ward and you will have access to a telephone at your bedside to arrange taking you home. If you need to stay overnight, the ward nurse will inform you and your family of the visiting times, you can have only have two visitors at a time.

Is there anything special I need to do before the procedure?

You must tell staff of any allergies. You may need some extra medication before the procedure.

You must tell staff if you take Warfarin, Sinthrome or other blood thinning tablets such as Apixaban/Rivaroxaban/Dabigatran or any with metformin added, such as Glucophage SR, Avandamet, Competact, Eucreas and Bolamyn SR. You may be asked to stop these tablets before the PCI.

You may need to take a total of 600mg of clopidogrel tablets the night before the procedure to make sure your blood is thin enough to reduce the risk during the procedure.

Do not have any caffeine, such as tea, coffee, or cola, **for a minimum of 24 hours** before you come to hospital. If pressure wire monitoring is used caffeine may affect the pressure measurements.

If you need any further information or advice about what to do before you come to hospital please telephone the cardiology specialist nurse on 0161 778 2450 or Ward 1 on 0161 778 2501.

I am booked to come to hospital on the morning of the stents and need to take clopidogrel 600mg, why?

If you need a stent, you must have extra thin blood for the procedure, in order to reduce the risk of blood clots developing when the stent is placed in position in the coronary artery. A blood clot may become a heart attack.

To ensure your blood is extra thin for the procedure and to reduce the risk of developing blood clots you will be given a total of 600mgs of clopidogrel tablets to take the night before you come to Ward 1. The side effects of taking the dose of clopidogrel may be dyspepsia, abdominal pain, diarrhoea, bleeding disorders, bruising and itchy skin. Refer to the patient information leaflet enclosed in the box of tablets if you require more detailed information.

If your procedure is delayed you should keep your clopidogrel tablets in the original box and store them in a safe place out of the reach of children. Take your tablets as instructed with your new date for the procedure.

If your procedure is cancelled, you will not require the clopidogrel tablets and should take the tablets to your local pharmacy or hospital pharmacy for disposal.

If you are taking Synthrome or other blood thinning tablets such as Warfarin/Apixaban/Rivaroxaban/Dabigatran you will have already been informed of when to stop taking it. If you have not please contact the cardiology specialist nurse on 0161 778 2450 or Ward 1 on 0161 778 2501.

I am booked to come to hospital on the morning I have the stent, should I still take my morning tablets?

Yes, you should take your normal morning tablets with a glass of water. You may be asked to stop taking some tablets. Ward 1 nurses will advise you as to when to restart the medication. **Continue with your other medications as usual, unless you have been advised by the clinic nurse.**

What will happen when I have the PCI procedure?

The cardiology specialist nurse or doctor will discuss the details of the procedure with you, including risks and complications. You can ask questions at any time.

Before the doctor starts, you will begin to have your blood pressure and heart tracing monitored, this will continue throughout the procedure. You will be awake during the PCI. In the theatre or catheter lab there is a team of staff who are doctors, nurses, radiographers (x-ray specialists) and technicians (ECG specialists).

A long, fine, special guide wire is introduced into an artery in the wrist or groin, the doctor uses a local anaesthetic so you shouldn't feel it. Using x-rays and dye, the guide wire is gently advanced through the blood vessels to the heart, and you may feel some missed or extra heart beats. The doctor will put the guide wire down the artery which has the narrowing, and then slide all the equipment on the wire into position. A special tube with a small balloon may be passed across the narrowing and then inflated to stretch the artery and squash the 'furring up', before being deflated and removed. This may be done a few times and different sizes of balloons may be used. When the balloon is inflated you may get some tight feelings in your chest. After the balloon stretching, a stent will be put in over the guide wire and a balloon will be inflated inside the stent. This may be repeated to make sure that the stent is against the artery wall. The stent will then be in position against the wall of the artery, the balloon will be deflated and all

the equipment removed, leaving the stent permanently against the inside wall of the coronary artery.

What is pressure wire monitoring?

Pressure wire monitoring measures the pressure of the flow of blood in the coronary artery. A very fine wire with a sensor on the tip is passed down the coronary artery. The procedure is similar to an angiogram, using x-ray equipment and dye. Do not have any caffeine products such as tea, coffee, or cola, **for a minimum of 24 hours** before you come to hospital. Caffeine may affect the pressure measurements.

The cardiologist measures the pressure flow of blood in the artery, then a medicine infusion or 'drip' is started and the pressure is measured again. The medicine causes the artery to open, as it would when you exercise. The medicine might make you feel a tightness in your chest, difficulty breathing and sometimes dizziness. This is normal and only lasts for a minute or two. The pressure monitoring is then finished and the cardiologist will tell you the results. When there is a narrowing in the artery the pressure will fall. The cardiologist will then know if the narrowing in the artery is enough to reduce the flow of blood through the artery and cause your symptoms. We know from research and studies that you will only benefit from a stent if the blood flow is reduced.

What is IVUS?

IVUS is intra vascular ultrasound scanning inside the coronary artery. The procedure is similar to an angiogram, using the same x-ray equipment and dye. A very fine wire with a special tip is passed down the coronary artery; the tip allows measurements of the atheroma "furring up" inside the artery to be taken. The measurements taken give the cardiologist very detailed information about the inside of the artery. The cardiologist can then make decisions about your treatment.

What is Rotablation?

Rotablation is the use of a tiny burr on a flexible wire. The burr is diamond tipped and is rotated very quickly inside the narrowing in the artery to smooth away the hard calcium build up. The calcium debris is smaller than a red blood cell and washed away in the blood stream. The procedure uses x-ray equipment and dye, similar to the angiogram. Once rotablation is completed the cardiologist can use an angioplasty balloon and stent.

What is a stent?

A stent is a fine metal framework which supports the wall of the artery and improves the flow of blood through the coronary artery to the wall of the heart.

There are different types of stents available to use, including bare metal, drug-eluting stents (which slowly release a drug), and bio-engineered stents, they have been rigorously researched and tested.

Your doctor will choose which stents to use, treating you as an individual, considering NICE (National Institute for Clinical Excellence) guidelines for the different types of stents, recent research and studies.

Once the stent is in place your body begins to heal around it and scar tissue forms. Studies show that some stents develop more scar tissue than others; however other stents have a greater risk of developing blood clots in them. Your doctor will decide which is the most suitable stent for you.

To greatly reduce the risk of blood clots you will need to take an extra blood thinning tablet (Clopidogrel). The ward nurses will tell you how long you need to take the clopidogrel tablets for. This may be for six months or a year.

When taking clopidogrel, it is very important not to stop this medication unless advised to do so by your cardiologist. You should

inform your dentist and other doctors caring for you that you are taking this medication.

What are the risks/complications of having elective PCI?

The intended benefits of the procedure - to improve the blood supply to the heart when narrowing or blockages are present within the coronary arteries and therefore relieve the symptoms of angina.

Alternative procedures that are available - other treatment options may include medical therapy using drugs, or coronary artery bypass graft surgery.

Significant, unavoidable or frequently occurring risks:

- PCI carries an average risk of 1 in 100-200. Serious complications can include heart attack, stroke, damage to major blood vessels, death, heart rhythm disturbance, perforation of the artery, bleeding around the heart (tamponade) and emergency heart surgery. Risks may be increased in older patients and those with other medical problems.
- Blockage of stents, causing heart attack, can occur due to blood clots (1 in 100) and anti-platelet drugs are required for up to 12 months following PCI. Re-narrowing of the stents may occur (1 in 20) and can cause further angina .
- Significant bleeding can occur requiring blood transfusion, compression, injection or surgical repair (1 in 200).
- Damage to kidneys can occur but is rare (1 in 500) but risk may be increased in some patients.
- Allergic reactions to contrast dye used may cause nausea or rash, and in rare cases anaphylactic shock.
- The procedure uses x-ray, which carries a small risk, but the level of radiation exposure is closely monitored.

The PCI team collect a lot of facts and figures about the procedure, which is then analysed with information from hospitals across the United Kingdom; this ensures we provide a safe, high quality service.

What will happen after I have the stent?

You will return to the ward for further monitoring. The nurses will continue to observe and manage your artery puncture site. You will be offered food and drinks. The nurses will inform you of the time you can be picked up from the ward to go home. If you are already in hospital they will arrange your transfer back to your original hospital.

When can I go home?

The nurse looking after you will advise you of your discharge time. You are usually ready for home late afternoon following a morning procedure and early evening following an afternoon procedure.

If the procedure was more complex than planned, you may need to stay longer to recover or overnight, your nurse will advise you.

You must have someone to collect you from the ward and drive you home, and a sensible adult to stay with you overnight.

If you have come from another hospital, you will usually be transferred back.

Your nurse will explain how to care for the puncture site, explain your medication, and give you an information leaflet with contact numbers. You will be given an information card about your blood thinning tablets - aspirin, clopidogrel or ticagrelor. Your GP will be sent a detailed procedure letter.

If you have agreed to referral to your local cardiac rehabilitation team, they will contact you by telephone or letter.

You may need a blood test to check your kidney function in approximately three days after the procedure.

You will receive a follow-up appointment in the post.

You should continue with all your medication, including aspirin. Medications will be reviewed in your follow-up appointment.

Aftercare advice

How should I care for the puncture site?

Check the puncture site once a day, for the next seven days and contact the hospital if you have any concerns. Your nurse will explain what to look for and what is normal.

We do not expect any serious problems following your procedure however if you notice any of the following:

- Excessive bleeding or swelling from your puncture site, lie down and apply pressure. Dial 999 for an ambulance.
- Coldness, blueness, numbness or excessive pain in the affected arm or leg. Dial 999 for an ambulance.

Bruising around the puncture site. This is fairly common. However, if it is excessive or you are worried please contact Ward 1 on 0161 778 2501 at any time, 24 hours a day.

Do not do any heavy lifting for five days, for example carrying shopping bags, vacuuming or lawn mowing.

Wrist: If the wrist is used you will return to the ward with a TR (trans-radial) band, a special type of plastic band, underneath which is a small balloon. The balloon will press hard on the artery to stop the bleeding. The nurse will slowly deflate the balloon to make sure that there is no bleeding. The 'band' will be taken off before you go home. Do not wear jewellery or a watch on the wrist for 5-7 days.

Groin: An Angioseal (plug) may be put in the artery in the groin to stop any bleeding. This is made from collagen and will dissolve within 3 months. The Angioseal will feel like a small bead or pea-sized lump in the groin, this is normal, and will slowly reduce as it

dissolves. If the Angioseal is not used, the nurse may press on the groin, or use a special item of equipment to press on the groin, to stop any bleeding.

When can I have a shower and/or bath?

You may shower the next day. The clear plaster should come off the next day. Do not put any cream or lotion on the puncture site. Do not bathe, swim or soak the puncture site in water for 5-7 days. Do not do any heavy lifting for five days, for example carrying shopping bags, vacuuming or lawn mowing.

Is chest pain afterwards normal?

Most people do not get chest pain after PCI. Some people can experience coronary artery spasm afterwards, which can be like angina but usually settles. Some people may get further angina coming from other diseased arteries. You can continue to use your GTN spray after the procedure if required. If you get more and more angina you need to make an early appointment with your GP.

How long do I need to take the clopidogrel for?

The ward nurses will tell you how long you need to take the clopidogrel tablets for, it may be six months or a year. Aspirin should continue for life. You will be given a clopidogrel information card. You must show the card to your dentist and any other doctors or specialists who may care for you while you are taking it. Clopidogrel reduces the risk of getting a blood clot in the stent. Instead of clopidogrel some people take ticagrelor or prasugrel, this is usually after a heart attack.

It is extremely important that you do not stop taking these tablets unless advised to do so by your cardiologist.

When can I increase my activity and start exercise?

Do not start any new exercises for two weeks; continue with your usual routine. After two weeks, you can begin to increase your activity. You will be invited to your cardiac rehabilitation programme and their cardiac rehabilitation team will contact you with an appointment.

If you have had a heart attack before undergoing PCI do not do any new exercises for four weeks. It is usual to attend the cardiac rehabilitation programme after four weeks.

When can I return to work?

It is generally alright to go back to work after one week if you are returning to an office based job. If you are returning to a job that involves heavy lifting you will need to have two weeks off work. Speak to the nurses for advice or contact your G.P.

If you have had heart attack before undergoing PCI it is usual to be off work for at least six weeks.

When can I drive?

Inform your insurance company that you have had PCI, as many insurance policies need to be updated with details of any changes to your health.

The DVLA state - **Do not drive your car or motorcycle for at least one week.** You do not need to notify the DVLA.

The DVLA state - **Bus and lorry drivers must not drive and must inform the DVLA.** Licence will be refused or revoked. Driving may be relicensed after at least six weeks if the requirements for exercise or other functional tests can be met and there is no other disqualifying condition.

When can I have a holiday?

You can travel within the British Isles after one to two weeks. If you travel within the British Isles you do not need extra travel insurance. Inform your travel insurance company that you have had PCI. **The cardiologists recommend not flying for four weeks.** It is highly recommended that you have travel insurance; you may need to 'shop around' to find a suitable policy. The British Heart Foundation can suggest companies that can provide travel insurance.

If you have had a heart attack, ask for further holiday advice from your cardiac rehabilitation nurse.

What can I do to help?

- If you smoke, stop smoking.
- Control your blood pressure.
- Lower your cholesterol, by eating a healthy diet and usually by taking cholesterol lowering tablets called statins.
- Control your weight.
- Be more physically active.
- Aim for five portions of fruit and vegetables each day at least.
- Reduce stress.
- If you are diabetic it is important for your heart and your health that you control your diabetes.

Some of the lifestyle causes of heart disease can be changed to reduce your risk of further heart problems in the future. The cardiac rehabilitation programme you will be invited to can help you begin these lifestyle changes. Even if you have had a heart attack, or been diagnosed with coronary heart disease, you can help your heart to stay healthy and reduce your risk of further problems.

Information prior to PCI - to be completed and discussed with the cardiology nurse in clinic

- If you drive, **do not come in your car.** You will be unable to drive for at least one week after your procedure. Please ensure that someone is available to collect you on the day of your procedure and stay with you overnight.
- You will be admitted to a single sex bay, staff will always ensure your privacy and dignity is maintained at all times.
- If you are on anticoagulant therapy and take warfarin or sinthrome, interrupt your medication as advised by your anticoagulant specialist nurse team.
- If you are taking blood thinning tablets such as Apixaban/Rivaroxaban/Dabigatran you will be advised to interrupt the tablets before the procedure.
- Take your clopidogrel 600mg tablets the night before you come to Ward 1.
- Take your aspirin 300mg tablet the night before you come to Ward 1.
- Do not have any drinks containing caffeine **for a minimum of 24 hours** before you come in.
- **You must not have anything to eat after 4am on the day of the procedure.**
- **Have a light breakfast and you must not have anything to eat after 9am on the day of the procedure.**
- On the day of your procedure, you may continue to drink water before you come in.
- Drink one and half to two litres of water before the procedure.
- **You may be asked not to take these medications on the day of your procedure and for 2 days afterwards.** If you have diabetes and take any of the following medications:
 - **Metformin**
 - **Glucophage SR**

- **Avandamet**
- **Competact**
- Bring all your current medications with you, including any inhalers, and follow any instructions that you have been given regarding your medication. You may take your usual morning tablets prior to your admission with water.

You will require comfortable clothing, please bring slippers or indoor shoes if you have them. Please bring any toiletries and comfortable clothing that you may need for your stay.

Ward 1, Fairfield General Hospital, telephone number 0161 778 2501 at any time 24 hours.

Ward 2 - 0161 778 3983

Cardiology Specialist Nurse, telephone number 0161 778 2450.

Contact numbers, useful numbers and website addresses

Ward 2	0161 778 3983
Ward 1	0161 778 2501
Cardiology Specialist Nurse	0161 778 2450
Switchboard at Northern Care Alliance (Bury, Oldham, Rochdale)	0161 624 0420

Cardiac rehabilitation teams and cardiology specialist nurses

Cardiac Services Telephone Number

Fairfield General Hospital	0161 778 2450
North Manchester General Hospital	0161 720 2395
Royal Oldham Hospital	0161 627 8059

BOC Healthcare Cardiac Rehabilitation

for the Heywood, Rochdale and Middleton area Helpline - 0800 012 1858 or email bocclinicalservices@nhs.net

British Heart Foundation Heart Information Line

Helpline 0300 330 3311 or email hearthelpline@bhf.org.uk

www.bhf.org.uk

DVLA

DVLA drivers medical enquiries - 0300 790 6806

www.dvla.gov.uk

NHS Live Well

www.nhs.uk

Stop Smoking

NHS Smokefree Helpline: 0300 123 1044

Local smoking cessation numbers

Rochdale, Heywood and Middleton - 01706 751190

Bury Live Well Service - 0161 253 7575

Oldham - 0161 960 0266

In Greater Manchester contact your GP receptionist for further information.

Diabetes UK

Diabetes Care line - 0345 123 2399

www.diabetes.org.uk

If English is not your first language and you need help, please contact the Interpretation and Translation Service

Jeśli angielski nie jest twoim pierwszym językiem i potrzebujesz pomocy, skontaktuj się z działem tłumaczeń ustnych i pisemnych

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☎ : 0161 627 8770

@ : interpretation@pat.nhs.uk

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For advice on stopping smoking contact the Specialist Stop Smoking Service on 01706 517 522

For general enquiries please contact the Patient Advice and Liaison Service (PALS) on 0161 604 5897

For enquiries regarding clinic appointments, clinical care and treatment please contact 0161 624 0420 and the Switchboard Operator will put you through to the correct department / service

The Northern Care Alliance NHS Group (NCA) is one of the largest NHS organisations in the country, employing 17,000 staff and providing a range of hospital and community healthcare services to around 1 million people across Salford, Oldham, Bury, Rochdale and surrounding areas. Our Care Organisations are responsible for providing our services, delivering safe, high quality and reliable care to the local communities they serve.

The NCA brings together Salford Royal NHS Foundation Trust and the hospitals and community services of The Royal Oldham Hospital, Fairfield General Hospital in Bury, and Rochdale Infirmary (currently part of The Pennine Acute Hospitals NHS Trust).

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