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**CORONARY ANGIOPLASTY  
(PERCUTANEOUS  
CORONARY INTERVENTION)**

This information booklet will talk you through all aspects of coronary angioplasty, including:

- What the procedure entails
- Preparation for the procedure
- Potential risks and side-effects

## Coronary Angioplasty (PCI)

Coronary angioplasty, also called PCI or the balloon and stent procedure, is the method used to deal with tight narrowings in the coronary arteries that are affecting the blood supply to the heart. Developed more than a quarter of a century ago, since when there have been many remarkable technological advances, the technique is frequently used to treat **angina**. There are some similarities to cardiac catheterisation, in that it is also performed in the catheter laboratory (cath lab) with very similar equipment, but there are also fundamental differences.

Whereas cardiac catheterisation is an investigative tool, angioplasty is a treatment. A fine flexible tube (2-3 mm in diameter) is passed up the artery in the leg or arm under local anaesthetic to the coronary artery using X-ray guidance. An extremely fine wire is passed along the tube and into the narrowed coronary artery. A very small deflated balloon is then threaded over the wire and up into the coronary artery to the site of the narrowing. There it is inflated, pushing the atheroma (furring up) into the vessel wall to remove the obstruction to blood flow. This simple concept is surprisingly effective. However, if only a balloon is used, approximately one third of the narrowings recur, typically within the first four months of the procedure. This is called **restenosis**. To minimise the risk of restenosis, coronary stents have been developed.

A **stent** is a precision-made tube or mesh, constructed from stainless steel or a similar alloy. It is mounted on the deflated angioplasty balloon, such that when the balloon is inflated the stent expands to form a mesh-like scaffold to keep the artery open. This enlarges the vessel lumen and allows more blood to pass, improving or relieving the symptoms of angina. The stent is a permanent device, which remains in the artery when the deflated balloon is removed. Following stent insertion the likelihood of the narrowing recurring to the extent that chest pains return is small.

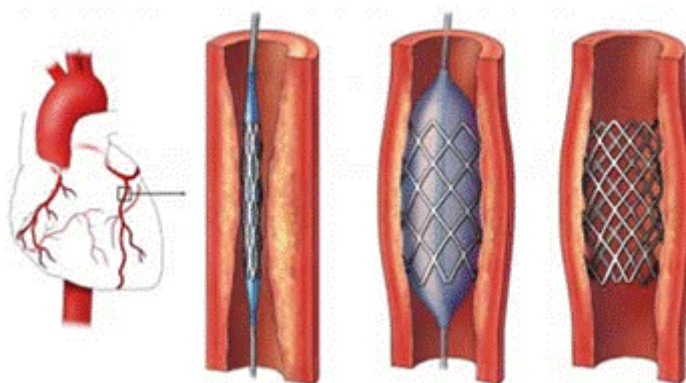


Figure 1: Placement of a stent in a coronary artery

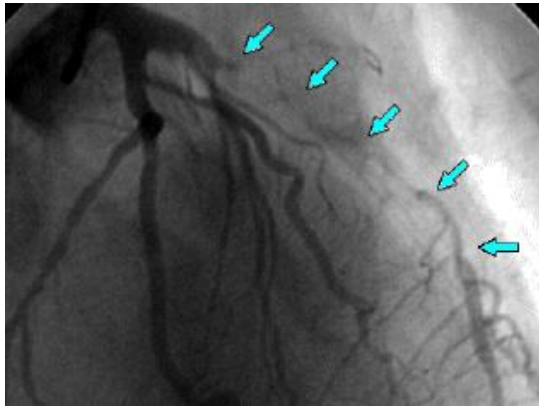
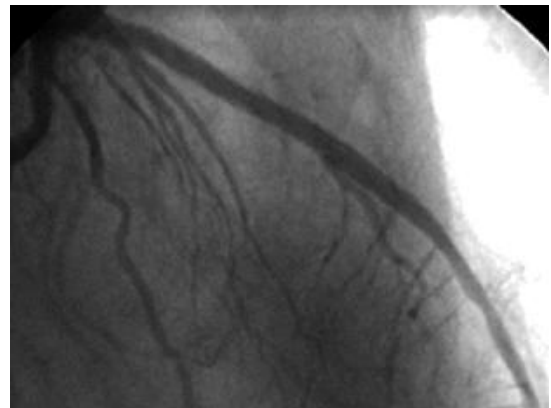


Figure 2: Angiogram showing a blocked artery (arrows)

Figure 3: Artery reopened using several stents



In recent years research has focused on reducing the restenosis rates even further. Although the rates are much lower after stenting than after simple balloon angioplasty, there is still a possibility of restenosis. Trials have investigated so called "drug-eluting stents", stents which are impregnated with minute amounts of a drug that inhibits the process of restenosis. The results are impressive, with rates in single figures, such that drug-eluting stents are now used preferentially over "bare metal stents" in certain cases, especially in smaller arteries and longer narrowings, where restenosis rates with bare metal stents are typically higher than usual.

You will given special medicines to keep the blood thin during and following stenting. Generally speaking, you will take Aspirin for life and Clopidogrel (Plavix, another blood thinner) for up to a year and occasionally longer if you have a drug-eluting stent. These drugs play a *crucial* role in minimising the risk of a stent clotting up.

Prior to the procedure you must not eat or drink for 4-6 hours. You should take your usual medication with a sip of water, but generally speaking you will be advised to omit water tablets (diuretics) on that day. Diabetics are given special advice, particularly those taking Metformin or Insulin, as are patients on Warfarin.

### **Are there any risks or side-effects?**

As with cardiac catheterisation, any procedure on the heart carries risks, which have to be balanced against the benefits. These risks vary depending on patient factors, such as age, presence of other medical problems including diabetes, previous stroke, and kidney damage. The most common side-effect is bruising and some discomfort at the site of catheter entry (usually the groin). This is generally mild and short-lived, but may be greater in patients taking blood thinners.

Serious risks are uncommon, but if they occur they can be potentially life-threatening. Whereas the risk is approximately 1:1000 for cardiac catheterisation, it is higher for angioplasty (PCI), since this involves greater instrumentation of the heart - remember that, unlike cardiac catheterisation, it is a treatment and not just a diagnostic tool.

The risks include damage at the site of arterial access, bleeding, heart attack, impairment of kidney function (rare in patients with normal kidney function), allergic reaction to the dye, stroke, emergency heart surgery and death. The most recently published figures for the UK give a risk of a heart attack as <1:300, of emergency bypass surgery (CABG) as 1:500 and a risk of death as 1:200. These risks are an average for all cases combined. The risks would be much lower, for example, in a patient with the narrowing in one artery alone and with no other medical problems, in contrast with an emergency procedure in a patient in the throes of a heart attack. Remember that you will be in a cardiac catheter lab, with a cardiology team (doctor, nurses, radiographer and cardiac technician) and all the equipment needed to look after you should there be a problem with your heart.

The procedure takes from 30 minutes to 2 hours, depending on the number of narrowings to be treated and the complexity of your case. However, because we are dealing with the heart, you are usually kept in hospital overnight and will be monitored carefully during that time. After discharge, you should expect to take things easily for a day or two, since the groin will probably be bruised and sore. By law you are not allowed to drive for one week after an angioplasty.

It is important that you have the opportunity to discuss your case and air any concerns you may have so that you understand the procedure, what it involves, why it has been recommended for you, and the risks and benefits. You can find out more information from my website ([www.drholdright.co.uk](http://www.drholdright.co.uk)) and many others, including national bodies such as the British Heart Foundation ([www.bhf.org.uk](http://www.bhf.org.uk)), the British Cardiovascular Society ([www.bcs.com](http://www.bcs.com)) and the British Cardiovascular Intervention Society ([www.bcis.org.uk](http://www.bcis.org.uk)).

Please do not hesitate to contact the practice should you have any concerns or questions.