

Appendix 2

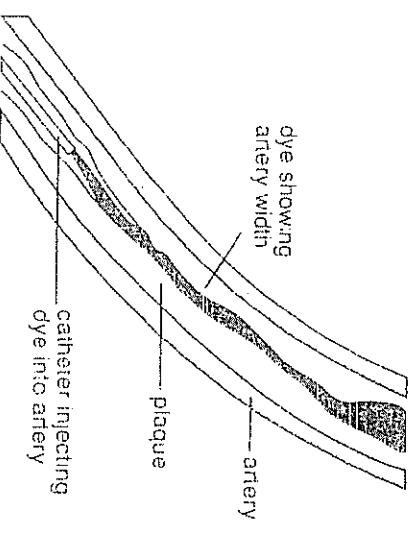
Solutions to atherosclerosis

Atherosclerosis can significantly reduce blood flow to and from the heart. The following medical procedures aim to restore blood flow in blood vessels to and from the heart. The method used for removing a plaque from an artery depends on the location of the plaque, size of the plaque and the number of plaques in various arteries.

The following text has been derived from:
Hennepin County Medical Centre, *Interventional Cardiology*,
<http://www.hennepin.org/depis_surgery/cardiothoracic/interventionalcardio.html>
(accessed 7 July 2000).

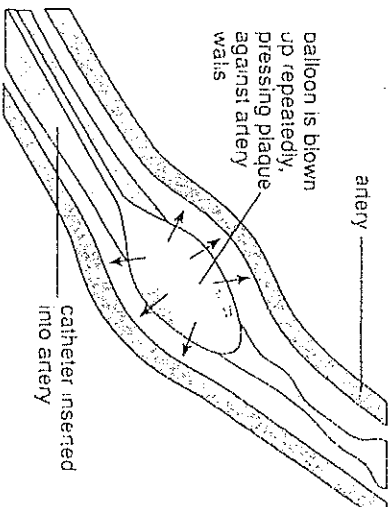
Cardiac catheterization

Cardiac catheterization is a diagnostic study to evaluate the coronary arteries. A catheter is inserted in an artery, usually in the groin, and advanced to the heart. Dye is injected through the catheter allowing the cardiologist to get pictures of the blood flow to the heart. This enables the cardiologist to detect areas of narrowing or obstruction.



The results of this test are used to help make a decision regarding further treatment options. It is usually done on an outpatient basis and requires a stay of approximately 4-8 hours at the hospital.

Balloon angioplasty



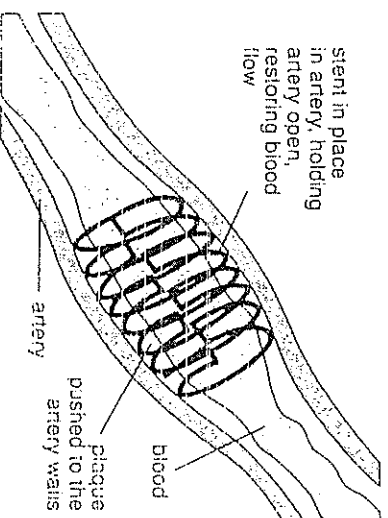
Balloon angioplasty is a procedure performed in the cardiac cath lab to open or widen a narrowed coronary artery. A catheter with a balloon attached is inserted in an artery in the groin. When it reaches the area of obstruction or narrowing in the coronary artery the balloon is inflated.

Inflating the balloon causes the plaque inside the artery to crack and widens the artery. The balloon is inflated and deflated repeatedly until the artery is open and blood flow is restored.

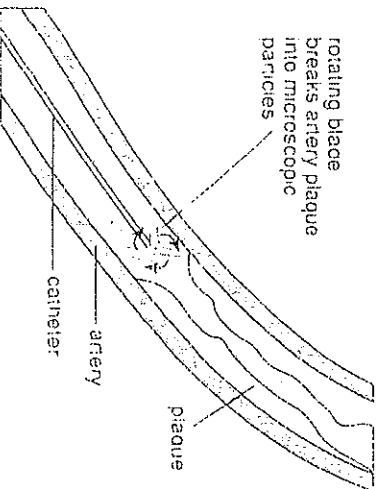
Balloon angioplasty is commonly done in patients who have significant narrowing in one or two coronary arteries.

Stents

Stents are devices that are inserted in a narrowed area of a coronary artery. They are usually made of an expandable stainless steel mesh. The stent is mounted on a balloon catheter which is inflated to expand the stent in the artery. The catheter is then withdrawn leaving the stent in place. The stent works by widening the artery, helping to keep it open.



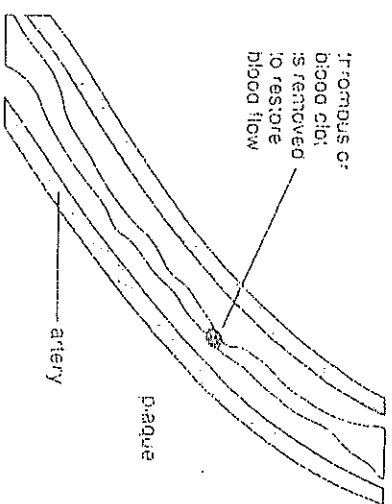
Atherectomy/Rotablator



An atherectomy is removal of the plaque from the artery wall using a catheter with a cutting blade attached. A **rotablator** is a catheter with a diamond tip which rotates at a high speed and breaks the plaque into microscopic particles. These particles are then able to pass through the bloodstream.

Thrombectomy

A thrombectomy is the removal of a thrombus, or clot, which is obstructing blood flow.

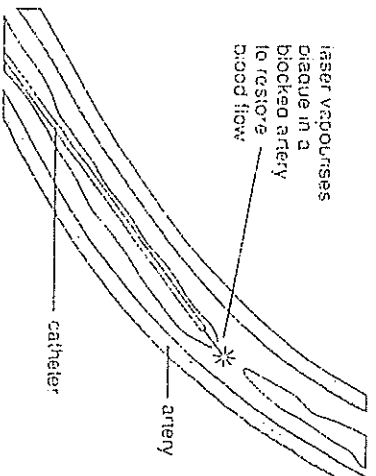


Laser angioplasty

The following information was obtained directly from:

Javey, A. The world of Science Laser Angioplasty - *Applications of Excimer Lasers in Angioplasty*. <<http://www.theworldofscience.com/laser-angioplasty.html>> (accessed 27 July 2000).

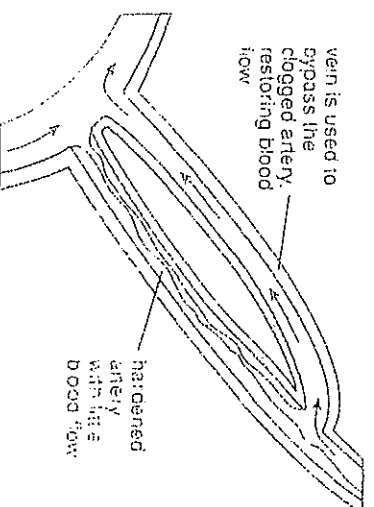
One procedure used to remove a plaque is laser angioplasty. In laser angioplasty, a thin tube (catheter) is inserted into an artery and moved through the blood vessels to the blocked artery. The laser emits short pulses of photons that cause the plaque to vaporize. Laser angioplasty is typically used with balloon angioplasty.



When a plaque has totally blocked an artery, laser angioplasty can be used to drill a hole in the plaque, so the balloon angioplasty can be successfully performed. Today, the usage of laser and balloon angioplasty has become so popular that bypass operation is barely used.

Bypass surgery

When an artery is unable to be opened with forms of angioplasty, the heart may be bypassed. Veins from other parts of the body are removed and placed in an area to bypass the blocked artery. This restores blood flow around the blockage.



2001 HIGHER SCHOOL CERTIFICATE EXAMINATION
Senior Science

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Centre Number

Section I – Part B (continued)

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Student Number

Question 22 (7 marks)

Marks

- (a) Explain ONE effect of a build-up of plaque in blood vessels on the flow of blood. 2

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- (b) Compare the advantages and disadvantages of TWO treatments available to a patient suffering from the effects of a build-up of plaque in their arteries. 5

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