

CARDIAC REHABILITATION PHASE IV

THE WRIGHT FOUNDATION
New South Wales

Surgical Interventions

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Response of the ageing heart to cardiac surgery

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    graph LR
      A[Young Heart] -- Cardiac Surgery --> B[Low mortality  
Few complications]
      C[Biologically Ageing Heart] -- Cardiac Surgery --> D[High mortality  
Many complications]
  
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Coronary Angiography and Left Ventriculography


- Angiography involves injecting a dye into the coronary arteries. The degree of blockage can then be observed.
- Left Ventriculography (or Left Heart Ventricular Angiography) is a procedure to look at the left side of the heart and sometimes the coronary arteries.
- The rationale is to identify high risk patients in whom coronary angioplasty and subsequent revascularization might improve survival
- Such a strategy can be effective only if the patient's prognosis on medical therapy is sufficiently poor that it can be improved

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Coronary angioplasty


- If a coronary angiography has shown a significant narrowing in an artery due to arteriosclerosis a coronary angioplasty with stenting may be indicated.
- This is a treatment which improves the blood supply to the heart muscle.
- A catheter (a fine, hollow tube) with a small inflatable balloon at its tip is passed into an artery in either the groin or the arm. The operator then uses X-ray screening to direct the catheter to a coronary artery until its tip reaches the narrowed or blocked section.
- The balloon is then gently inflated so that it squashes the fatty tissue responsible for the atherosclerotic changes. As a result the artery is widened.
- If required a 'stent' will be left in place and this maintains the artery open. Stenting is now routine.

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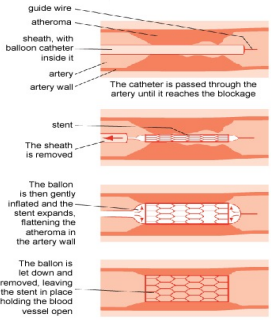
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Coronary angioplasty




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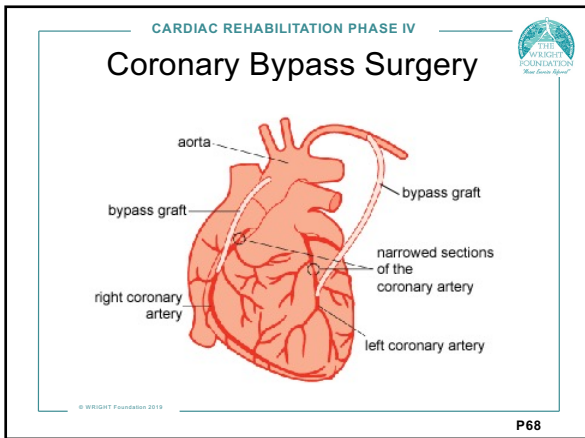
Coronary bypass surgery

- Coronary angioplasty is usually successful, but it can sometimes fail. If this occurs it is necessary to proceed with surgery.
- The aim of the operation is to bypass narrowed sections of coronary arteries by grafting a blood vessel between the aorta (the main artery leaving the heart) and a point in the coronary artery beyond the narrowed or blocked area (see the illustration below). A section of vein removed from the leg is used for the bypass channel or graft but increasingly the internal mammary arteries are used as they are less likely than vein grafts to narrow over time.
- Before the decision is taken to operate, the patient will need to have a coronary angiography to find out exactly which arteries are narrowed and which part of the artery is narrowed.

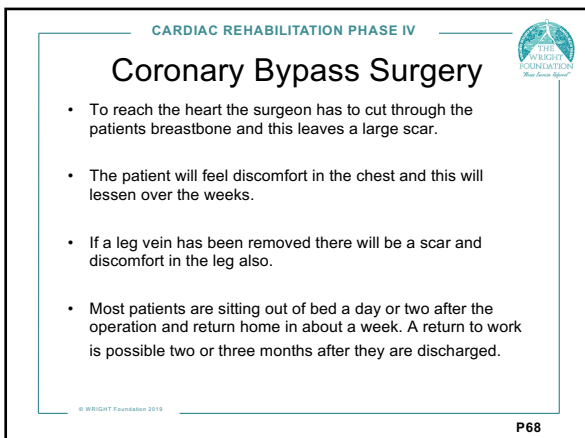
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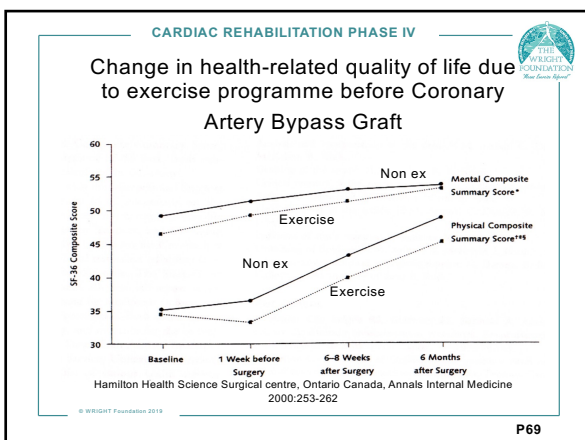
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Implantable Cardioverter Defibrillator


- An implantable cardioverter defibrillator or ICD is a small device which can be surgically implanted. It is battery operated.
- Like a normal defibrillator it can deliver a shock to a heart which is beating too slow or too fast, in order to restore a normal rhythm.
- It monitors the electrical signals in the heart. Therefore it can track the heart rhythm and when a shock is required, deliver it automatically.
- ICD's are used in patients at risk for recurrent, sustained ventricular tachycardia or those at risk of sudden cardiac death caused by ventricular fibrillation.

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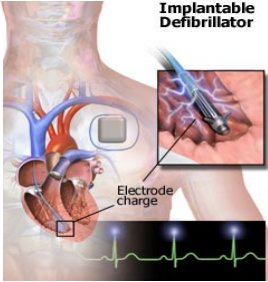
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Implantable Cardioverter Defibrillator




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Heart Transplant


- The first heart transplant was carried out in South Africa in 1967. In the UK, transplants are now carried out in eight centres around the country. Heart transplants are also carried out in children at Great Ormond Street, Harefield and Newcastle.
- About 300 heart transplants are carried out in the UK each year. This limit is set by the number of donor organs available.
- A much smaller number of heart and lung transplants are performed each year. These are for patients with diseases of the lung, or patients with lungs which have been damaged by heart abnormalities.
- Heart transplant patients are usually on a large medication regime.

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New Medical Therapies

- Stem cell treatment
- In 2005 scientists made great advances in the use of stem cells in MI patients. Stem cells are building block cells that can turn into any tissues in the body.
- Cells are taken from the bone marrow and, after treatment, they can possibly be used to repair damaged tissue of the myocardium.
- Tests on heart attack victims showed that the hearts of those given the therapy improved almost twice as much as those given a placebo treatment.
- The study was conducted by a team of scientists from the JW Goethe University in Frankfurt, Germany and involved more than 200 heart attack victims at hospitals across Europe.
- The results were presented at the AHA conference in Dallas in 2005.

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Stem cell treatment

- In a 2015 Cochrane review of clinical trials investigating the benefits of stem cell therapy for acute MI it was concluded that there is insufficient evidence for the benefits of stem cell therapy in such events, citing that most trials are small and showed no significant clinical difference. A call for more suitably sampled studies have been recommended (Fisher et al. 2015)

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Any questions?

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