

# Student Information Pack

## Cardiovascular & Thoracic Care Group



### ***UHSFT***

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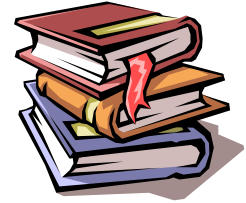
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## Welcome to the Unit

### General Guidelines

This welcome pack is designed to help you settle into your clinical placement in the Cardiovascular and Thoracic Unit, (CV&T) and give you some information regarding the clinical conditions and procedures that you are likely to experience. Please read this document carefully and carry it with you in your placement area for reference.

On placement you will be working within the CLIP Model and will be allocated a Practice Assessor to oversee your placement and each shift you will be allocated a Practice Supervisor who will work with you and other students on the shift. Each clinical area also has a nominated Student Link who allocates the off-duty and attends Care Group student link meetings. Please identify who the link in your area is as they are an additional support for you. The Care Group has an Education Lead who may provide extra support if necessary whilst also facilitating communication between the unit and the University. Their contact details are listed on the page below.



Your off-duty will be allocated for you, usually by the student link of the clinical area in which you are placed. In accordance with university guidelines, you will notice that your shifts will cover the range of Early, Late, Long Day or Night shifts. It is important that you stick to your allocated off duty as much as possible as the off-duty has been rostered to ensure the ward can accommodate all of the students they have on placement and facilitate the CLIP requirements. If you are the only student on a shift you will still be allocated to a Practice Supervisor. Each ward area has enough trained staff to supervise and support students on each shift. If you need to swap your off-duty for any reason, then please look at the number of other students working on that shift so that you can all be adequately supported. It is also important to remember that you are not able to work more than 45 hours in a week; therefore it will not be possible to work more hours in one week in order to get time off in subsequent weeks.

If you are unable to attend due to sickness or unforeseen circumstances please inform the placement area as soon as possible prior to your shift starting and for every shift following. Please inform the clinical area when you will be returning after your sickness and then a plan for making up your clinical hours can be arranged (this does not apply to BPP students). If you arrive on placement with hours to make up, do not assume you will be able to do this on this placement – this needs to be negotiated with each individual area and will take into consideration the number of other students also on placement and also the maximum number of hours you are allowed to work in one week.

When you have been allocated a Practice Assessor, it is essential that you discuss your assessment documents and objectives within the first few days so that your learning can be organised. All Practice Assessors are very busy with their clinical role and therefore a delay in submission of the e-Assessment documents may be likely if it is not discussed early in the placement.

Wards at UHS are now using the CLIP model for student placements. You should know what objectives you have to meet to complete your competencies and work towards these, documenting your achievement in your Daily/weekly logs as evidence for your Practice Assessor, Practice Supervisors will also give feedback on your performance. The paperwork you are required to complete for CLIP will be available on the ward and should stay on the ward until you complete the placement so that your Practice Assessor can access it and see your progress at any time.



Each clinical area will have a resource folder to support the learning of students; these contain information related to the nursing care and medical conditions encountered within the Care Group – please read these whilst on placement to facilitate your learning. Each area will also have access to the Internet that can be used for work purposes only. Please check with your supervisor or nurse in charge if planning to use this facility.

When you are on placement it is important that you recognise that as a student nurse you are **NOT** permitted to check patient's **blood results** or **take verbal blood results** over the telephone. If you are asked, please refer to a nursing member of staff on your ward.

It is also important to ensure that you make your student status known to patients, their families and other professionals, especially when you are on the telephone so that you are not placed in a position in which you feel unable to handle or unsure on how to manage.

During your time on the unit there may be the opportunity for you to experience time in other clinical areas or with specialist nursing team, maybe as part of a day or indeed a whole day. You will be expected to arrange these visits with your assessor so that we can ensure the receiving area is able to accommodate requests from all students. You may be aware of some fellow student nurses who have their placements split between two clinical areas within the Care Group. Whilst it is recognised that some students do not like the idea of having 'split' placements, offering experience in two clinical environments optimises the ability to complete all of the required learning outcomes, when perhaps a placement in just one area would make this more difficult. If your placement is not 'officially' split then you may be placed on a student line where you rotate into a different department for a couple of weeks. This is again designed to increase your learning and enable you to witness all aspects of the patients' pathway. Split placements and rotations will not be available to all students due to the capacity of the clinical areas and the availability of assessors/supervisors.

#### **COVID 19.**

Due to Covid 19 there are changes to practice. There will be Clean areas, Surveillance areas and confirmed Covid19 areas across the unit and the Trust and the configuration of the ward areas are subject to change to facilitate this. Please adhere to the Infection Prevention, PPE and cleaning protocols/policies for your placement area. If unsure of what to do speak to Infection Prevention or your Practice Assessor/Supervisor.

#### **Contact details**

**Lucy Hiscock**  
**Education Lead, Cardiovascular & Thoracic Care Group**  
**D Level North Wing**  
**Mailpoint 46, opposite NWD 123**  
**Lucinda.hiscock@uhs.nhs.uk**  
**Telephone 023 8120 3023 (Ext 3023) or Mobile 075 5422 7508**

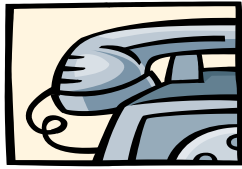
**Student Link in Clinical Area:**

Please complete the Student Details form at the end of this Pack and hand it to the Student Link or your Practice Assessor in the placement area.

### CV&T Student Nurse Orientation Checklist

<b>Students Name</b>	
<b>Practice Assessor Name</b>	
<b>Placement Area</b>	
<b>Date placement commences</b>	
<b>Placement Number</b>	

<b>Topics for discussion</b>	<b>Date</b>	<b>Student Signature</b>	<b>Practice Assessor Signature</b>
Emergency Contact procedures (i.e. cardiac arrest calls and other bleeps)			
Infection Control			
Manual Handling			
Health and Safety			
Fire			
Cardiac arrest procedure			
School of Nursing Initial interview			



## Telephone Directory

Ward	Code	Ext	Bleep
Southampton General Hospital	02380 777222	100	
Ward E1 - Paediatric	02381 20	6470	
Ward D4 – Vascular	02381 20	8468	
Cardiac High Dependency Unit - Cardiology	02381 20	6835	
Cardiac High Dependency Unit - Surgical	02381 20	6836	
Coronary Care Unit	02381 20	8570/8572	
Ward E3 Green. - Cardiac	02381 20	6472	
Ward E3 Blue	0238120	4111	
Ward E4 - Thoracic	02381 20	6498	
Ward E8 - Thoracic	0238120	6510	
Cardiac Catheter Labs and Cath Lab Day Unit (CLDU)	02381 20	4200/ 4420	
Young Adult Cardiac Unit-YACU E2	02381 20	6473	
Out Patients Dept	02381 20	3248	
Nurse Practitioners	02381 20	3872	Blp 2330
Pre Assessment Clinic/ Nurse Practitioners	02380 777222 then Bleep	8182	Blp 2895
Non-Invasive Cardiology	02381 20	6404	
Cardiac Rehabilitation Team	02381 20	6673	
Adult Congenital Liaison Team	02381 20	4739	Blp 1481
EP Nurse Specialists	02380 777222 then Bleep		Blp 1448
Thoracic Nurse Specialists	02381 20	8457	
Vascular Nurse Specialists	02380 777222 then Bleep		2750
Cardiac Intensive Care Unit	02381 20	6121	
Induction for Cardiac Theatres	02381 20	4543	On VLE

## Information about Each Ward Area

Patients are admitted to CV&T wards from across the region either as a routine / elective patient or as an emergency. Patients nursed on these wards may require procedures such as Cardiac Catheterisation / Percutaneous Coronary Intervention, Electrophysiology Studies (EPS), insertion of cardiac devices such as Pacemakers, Implantable Defibrillators and Cardiac Resynchronisation Devices. Alternatively patients may be awaiting or recovering from cardiac surgery, primarily Coronary Artery Bypass Grafting (CABG) or Mitral / Aortic Valve Replacement (MVR / AVR). Patients having cardiac surgery will go to CHDU or CTITU following their surgery and will normally return to the ward 24 hours later. Normal length of stay for patients having cardiac surgery is 5-7 days, although this may be longer for more complex patients or those having surgery as an emergency.

The cardiac wards are supported by Advanced Nurse Practitioners who help support the medical team with patient review, referrals and treatment. Their work helps to streamline the patient pathway and improve timely management of patient care.

**E1- Ocean Ward** – is now Part of Child Health Care Group Ocean Ward has 16 beds, for infants and children (up to 18 years of age) of which 4 are neonatal cots and 4 are dedicated for high care patients. Most of the children require medical or surgical intervention for congenital heart disease; however, a smaller number of patients are admitted for management of acquired heart disease e.g. infective endocarditis. A small number of children require thoracic surgery and are cared for under the thoracic/paediatric surgeons. Children also attend for day case treatment e.g. drug dosage increases/echoes under sedation.

### E3 Blue and E3 Green

**E3 Blue** is an 18 bedded ward, **E3 Green** is a 24 bedded ward, both care for Adult Cardiology and Cardiac Surgery patients. They have a specialist focus on caring for patients with Heart Failure and therefore have strong links with the Heart Failure team.



**E4** is a 20-bedded ward currently caring for patients undergoing planned/elective Cardiac, Vascular and Thoracic Surgery e.g. Lung cancer surgery, recurrent pleural effusions and pneumothoracies. E4 is not currently accepting emergency transfers and admissions from A&E or regional district hospitals, these patients are now cared for on E8 which is still under CV&T. E8 accepts patients following thoracic trauma and / or fractured ribs & sternum e.g. RTA's are also admitted on an emergency basis.

There are two thoracic nurse specialists who work closely with the consultants offering support, information and advice to patients and their families prior to, during and after their hospital stay. A Thoracic Case Manager who ensures patients' receive their operations in a timely manner, acting as a liaison between different regional hospitals to ensure all pre-operative preparation is completed and assist in pre-operative assessment clinics.

### **Young Adult Cardiac Unit (E2)**

is a 17 bedded Young Adult Congenital Ward. We take patients from age 17 upwards, and have a mixture of cardiac surgery, cardiology and adult congenital patients. We have patients both pre and post operatively, as well as taking emergency admissions from CCU and A&E and work closely with our Congenital Nurse Specialists to ensure the best care for our patients with increasingly complex cardiac issues.

YACU was completely refurbished in 2015 by Wessex Heartbeat and we are lucky to have excellent facilities for our long stay patients including a lounge and kitchen.

### **Cardiac Catheter Lab and Cath Lab Day Unit.**

**Cardiac Catheter Labs** are located in the North Wing on E-Level. It is a purpose designed and built Unit and consists of four fully equipped Cardiac Catheter Labs, a Hybrid Lab, a three bay reception area for Paediatrics and General Anaesthetic patients. We have the potential for five recovery bays, two of which are for paediatric and General Anaesthetic patients.

The routine lists run from Monday to Friday, from 0800 to 1800hrs. Week day nights and weekends are covered by an on-call service for emergencies. The Cardiac Catheter Lab is staffed to facilitate the 24hr 'Primary On-Call Service', whereby heart attack patients do not go to the Emergency Department to be thrombolysed (have their clot dissolved), but instead they come directly to the Cath Labs in order to have a PCI (ballooning or stenting of their arteries) if they need it. This must all happen within a given time scale.

The number of procedures carried out in a day varies. The cardiac catheter labs cover a wide range of cardiac procedures, the length of time these take varies according to the individual patient and the procedure itself. Most procedures are carried out under local anaesthetic with sedation and some require a general anaesthetic.

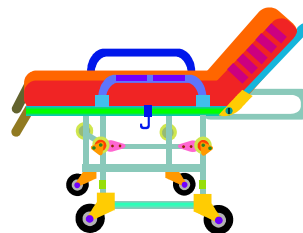
The team consists of a number of people with different skills including Doctors, Nurses and HCA's, Radiographers, Technicians, Anaesthetists (for the General Anaesthetic patients), ODP's, Porters and Domestics.

Here is a list of the procedures we do:

- Diagnostic Catheters (Angiography)
- Angioplasty and Stenting
- Primary Angioplasty
- Insertion of Temporary Wire
- Insertion of Permanent Pacemakers
- ICD/Biventricular ICD Implants
- Biventricular Permanent Pacemakers
- Micro Pacemakers
- Insertion of Implantable Loop Recorders (LINQ devices)
- Drainage of Pericardial Effusions
- Electrophysiology Studies and Ablations
- Insertions of Intra -aortic Balloon Pumps
- Paediatric Congenital Procedures
- Lead Extractions
- TAVI (Transcatheter aortic valve implantation)

**The Cath Lab Day Unit (CLDU)** works closely with the Cardiac Catheter Labs and comprises of 13 trolleys to accommodate elective day cases. The unit operates from Monday to Friday (excluding Bank Holidays) and is for adult patients undergoing the following elective procedures:

- Diagnostic coronary angiography
- Pacemaker / ICD implantation or box change/check
- ILR Implantation/Explantation
- DC Cardioversion
- Trans-Oesophageal Echocardiography
- Electrophysiological Studies, VT stimulation, Ablation,
- PCI / Standby Coronary Angiography
- Iron Infusions



The majority of patients are pre-assessed and identified for day case procedure, using the protocols for 'Day Case Coronary Angiography' and 'Day Case Chronic Rhythm Management'— these protocols are available within the CLDU.

The CLDU does not provide accommodation for "outlier" patients from outside the Cardiothoracic Care Group; patients post MI from CCU or post-operative cardiac surgery or thoracic surgery patients.

#### **D4- Vascular Ward**

D4 is a 22-bedded adult ward specialising in the care of patients requiring vascular surgery and management of vascular conditions. Examples of procedures performed on patients admitted to this ward include aortic aneurysm repairs, carotid endarterectomy's, femoral - popliteal bypasses, femoral -distal bypasses, amputations, chronic wound management and skin grafts.

The vascular team and ward moved into the Cardiovascular and Thoracic Care Group in 2008 offering exciting learning potential for all of our staff and students. As a student on this ward, you may notice slightly different paperwork in use.

A team of vascular specialist nurses support the care and management of patients on this ward, taking a large role in the management of patients receiving vac-pump therapy and chronic wound management.

#### **CHDU**

The Cardiac High Dependency Unit comprises up to 20 cardiac surgical and cardiology beds.

CHDU can take up to three ventilated 'Fast Track' cardiac surgical patients per day Monday –Friday, the other surgical beds are level 2 step-down beds for patients who have either moved from CTITU and are not quite ready for the ward, or Fast track patients who are not ready to move. These patients may require inotropic support, non-invasive ventilation or continuous haemodynamic monitoring. The cardiology beds serve the region and are therefore utilised for unstable cardiac patients requiring cardiac intervention, investigation or monitoring.

#### **CCU**

The Coronary Care Unit is an 17-bedded acute area dedicated to care for patients who require close nursing and medical observation due to emergency admission with an Acute Coronary Syndrome (ACS) or other cardiac problems. 6 of these beds are currently designated for confirmed Covid negative cardiac patients.



The nurses on the unit are trained in ECG and rhythm recognition and there is always an intermediate or advanced life support provider and an ACS specialist nurse on duty. There are two ward rounds each day, one with a consultant cardiologist and one with a specialist registrar. There are typically 6 trained nurses and 2 HCAs per shift each day and at night.

The main patient group admitted to CCU are those experiencing symptoms of ACS symptoms (including Myocardial Infarction (MI)), patients with heart rhythm problems (arrhythmias) and those with acute exacerbations of heart failure. One bed is always kept free to facilitate primary percutaneous intervention in those diagnosed with an acute ST Elevation MI. Patients may be transferred from across the hospital or admitted directly from A&E or the GP. The ACS (Acute Coronary Syndrome) nurse specialists work closely with the staff in A&E and CCU.

**D2 – in December we will be opening another ward and the cardiac/thoracic patients currently on E8 and some from CCU will be moving to this area.**

### **Nurse Practitioners**

The team of nurse practitioners cover the specialities of cardiac surgery, cardiology and thoracic surgery running pre-assessment clinics for patients awaiting procedures and operations. The team also offer specialist advice and support to ward staff including care of patients with complicated healing following arterial cannulation during cardiac interventions.



### **Cardiac Rehab**

The cardiac rehabilitation team see all patients who have had an MI, PCI or cardiac surgery requiring a sternotomy.

The team gives patients' advice on their condition and how they can help themselves in getting back to normal. They cover all the risk factors associated with CHD and ensure patients have enough information and contact details for their local cardiac rehabilitation programme which will also help recovery and be a continued support once they are at home.

### **Non-Invasive Cardiology**

A team of specialist technicians who perform diagnostic procedures such as Echocardiograms and ECG's for Out Patients and across the wards as well as being an important part of the team working within the Cardiac Catheter Labs assisting with the procedures. They also remotely monitor patients in the community with ILRs, PPMs and ICDs to pick up any issues recorded by the devices.

### **OPD**

The Outpatient Department is the gateway to the Cardiovascular and Thoracic Care Group with this department often representing the start and end of the patient's journey.

Clinics held include cardiology, cardiac surgery, adult congenital heart, thoracic, vascular and nurse-led pre assessment clinics.

Most of the clinics held are 'one-stop' clinics meaning that not only does the patient have a consultation with a doctor they also are seen by the nurse practitioner / case manager team / anaesthetist as part of their pre-assessment, completion of X-rays, ECG's and ECHO's / Spirometry if necessary in readiness for admission for their procedure.

Outpatients also undertake vascular clinics reviewing patients with chronic wounds, drawing on specialist vascular knowledge from consultants and clinical nurse specialists.

## Specialist Nursing Teams / Support Teams

- Transfer Co-ordinators
- Case Managers – Cardiac & Thoracic
- Advanced Nurse Practitioners
- Cardiac Rehab Nurses
- Heart Failure Nurse Specialists
- ACS Team
- Cardiac Radiographers
- Thoracic Nurse Specialists
- Vascular Nurse Specialists
- Adult Congenital Heart Disease Nurse Specialists
- EP Nurse Specialists
- Ward based Phlebotomists
- Surgical Care Practitioner



## Consultants and Medical Teams.

CV&T have their own Consultants with teams covering Cardiac Surgery, Cardiology, Thoracic and Vascular medicine and surgery. They liaise with other teams across the hospital to ensure the patients get all their clinical needs met.

Within these groups there are teams which specialise in particular areas of treatment e.g

- Adult Congenital Heart Disease – treating people born with a variety of heart defects,
- Interventionists who perform revascularisation of the heart
- Cardiac Rhythm Management (Electrophysiology) who specialise in disorders relating to the conduction system of the heart.

## EMERGENCIES

### Emergency Buzzer / Cardiac Arrest

There is a red emergency buzzer located by each patient's bed and in bathrooms and toilets. This should be pulled if there is a problem with a patient that requires immediate assistance, such as Cardiac Arrest, an unresponsive patient, a fall or simply where you feel that it is not safe to be alone with or to leave the patient to find assistance.

If you are asked to put a Cardiac Arrest call out - you need to **dial 2222** and the operator will ask you where you are and where the patient is; -

*i.e. Adult Cardiac Arrest, Ward E3, Room 24, Bed 1*

If you are asked to fast-bleep a member of the medical team – you need to **dial 2222** and ask to fast-bleep the member of staff you require assistance from.

Have a good look at the Crash Trolley, which is situated in your clinical area and identify where certain items are located - you never know when you may need to assist the team in a Cardiac Arrest. Next to the trolley is Emergency Suction and Oxygen.

### Fire

Please familiarise yourself with the location of;

- Fire extinguishers and exits
- Fire alarm break points



If an intermittent fire alarm rings ensure that all windows are closed and all doors are shut.

If a continuous fire alarm rings ensure that all doors and windows are shut and tell relatives to congregate at the lift area until the alarm ceases. The nurse in charge will explain what to do next.

Please identify who the local fire representative is in your local area, they will be able to advise you in any matters concerning fire safety.

## Health and Safety

There is a Health and Safety folder, which includes the policy for the Trust and the Care Group in all areas. There are Health and Safety and Infection Control Representatives located round the unit in each area, please identify who the representatives are in your placement area.

Health and Safety incorporates a number of issues that will affect you whilst you are in placement. It is therefore vital that you follow local policies and that you complete adverse event forms, with the help of your mentor if you

are exposed to a risk or become injured at work. If you need to complete an adverse event form for any reason then please inform the Education Lead (contact details above) so that they can ensure the event is followed through appropriately and can liaise with the University to ensure your ongoing safety.

Health & safety Issues that will affect you on placement include:

- Health and Safety at Work - relating to employees
- Infection Control Policy (ward representative)
- M.R.S.A Policy
- Clinical Risk Assessments
- C.O.S.H.H Risk Assessments

### Infection Prevention & MRSA

Infection Prevention is one of the key principles underpinning all care and you will be expected to maintain good infection control practices at all times. Due to the importance of infection control, you would have had a session on your induction day – please refer to this session throughout your placement.



Primarily good infection control may be maintained through ensuring you abide by ‘nothing below the elbows’, that you practice good hand hygiene as taught and that you maintain isolation care as appropriate. The trust have adopted a good practice guide of isolating patients within 4 hours of a new onset of diarrhoea, therefore please inform the nurse supporting you in practice if you are caring for a patient who has a new episode of loose stools. If you are unsure on any aspect of infection prevention please seek support from ward staff and refer to the StaffNet.

## Manual Handling

Within the Care Group there is a **No lifting policy**, which is designed to prevent staff developing back injuries. There are various aids that we use on the ward such as slide sheets and hoists to help move patients either in bed or bed to chair. Please ensure you have been taught how to use them correctly before attempting to use them on patients. Each clinical area has a Manual Handling Representative who will be happy to discuss any problems or queries.

### Catheter Lab Health and Safety

If you are visiting the Cardiac Catheter Lab or the X-ray dept, you may be exposed to ionising radiation in the form of x-rays. During your visit you will be given some basic information that you will need prior to visiting including:

- Lead rubber aprons (These can be heavy and hot and will be expected to wear them in the catheter lab. Please inform the staff if you have any back problems or are pregnant)
- Protective shields – Lead glass (You will be advised to stand behind these)
- Radiation decreases with distance, so the further away the less risk to radiation exposure.

PREGNANCY – ‘Staff that work with radiation have been shown that the amount of radiation they receive falls within variations in natural radiation seen around the country’ (Ionising Radiation Safety: A Handbook for Nurses). However if you do have any concerns, please mention this to a member of staff who can arrange for a radiographer to speak to you. Don’t let this deter you from a visit as other arrangements can be made.

## Performing Foot Observations

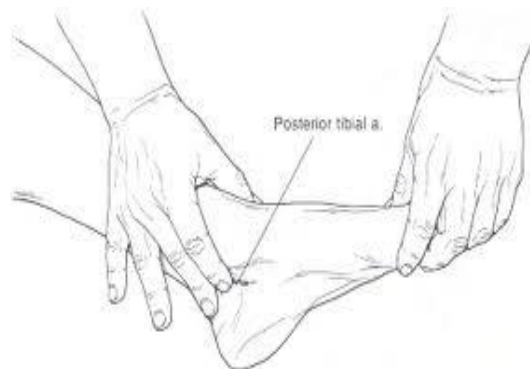
As a student working within the Care Group, you may be asked to perform foot observations, especially on the vascular ward and post some cardiac procedures such as Ablations or PCI's. It is therefore vital that you understand how to perform these as the absence of peripheral foot pulses is an indication of impaired blood supply to the limb. The procedure is outlined below, but please ensure that you are also observed in clinical practice:

1. Explain the procedure to the patient
2. Observe the leg for colour – red, white, mottled
3. Check the leg for any swelling and broken areas
4. Check the feet for temperature by cupping the foot with the palm of your hand and judging whether the foot is cold, cool or warm. It is important to wash your hands before feeling the patients feet – if your hands are very hot or cold, this will affect your perception of temperature
5. Feel for the DORSALIS PEDIS pulse or if this is not palpable, feel for the POSTERIOR TIBIAL pulse. If you cannot palpate either, speak to the nurse working with you. It may be that you need to use a Doppler probe to hear them but you will need to be assessed to use this piece of equipment.
6. When the pulse is located, mark the foot with a pen so that the pulse can be relocated when required
7. Complete foot observation charts and compare against baseline observations to determine if there are any changes. Report as required to the nursing / medical team.

**Dorsalis Pedis Pulse**



**Posterior Tibial Pulse**



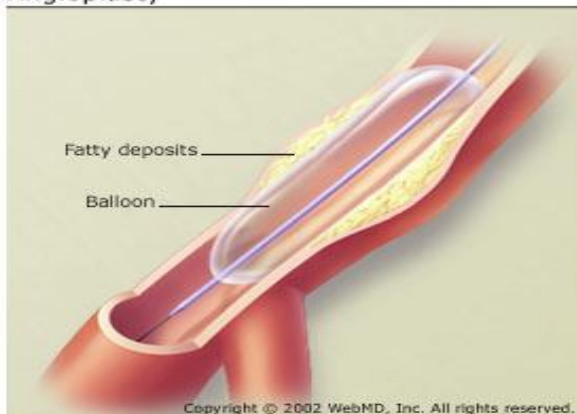
## Common Cardiac Conditions & Procedures

### Cardiac Catheters / Angiogram

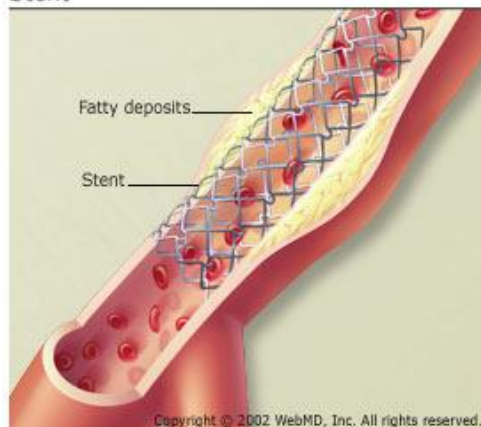
A cardiac catheter or angiogram is a diagnostic test performed to assess heart function and the extent of coronary artery disease. The procedure is carried out under sterile conditions in the Catheter Laboratory under local anaesthetic. Access is gained through the percutaneous puncture of the femoral artery or vein, or less commonly via the brachial artery. The cardiac catheter is introduced and guided under x-ray to the ventricles. Contrast medium is injected through the catheter with video and cameras running to produce x-ray films. An angioplasty is a balloon that is inserted into the heart vessels to widen any blockages. A stent is a small wire cage inserted into the vessels to hold the vessel open where the blockage once was.



Angioplasty



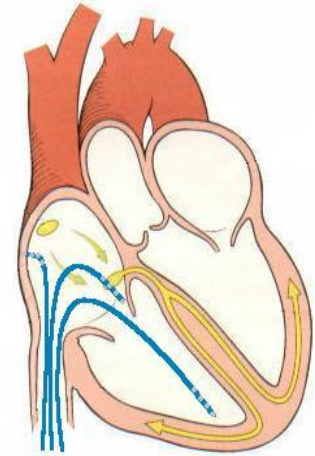
Stent





## Electrophysiological Studies/VT Stimulation

EP Studies are performed to identify the cause and origin of abnormal heart rhythms and involves the insertion of a temporary pacing wire percutaneously under local anaesthetic through the femoral vein and/or the subclavian vein, into the right heart chambers and the Bundle of His. This procedure is undertaken in the catheter lab under x-ray. EPS detect any abnormalities in impulse conduction and identifies the origin of the abnormal QRS complex e.g. is it supra ventricular or ventricular. The temporary pacing wire is used to stimulate the heart with precisely timed impulses, thereby inducing supra-ventricular or ventricular tachycardia. Once stimulated, these rhythms can be over-ridden with pacing or Cardioversion. Common rhythms detected in this way are recurrent SVT with AF, Wolfe-Parkinson-White syndrome, re-entry tachycardia and VT.



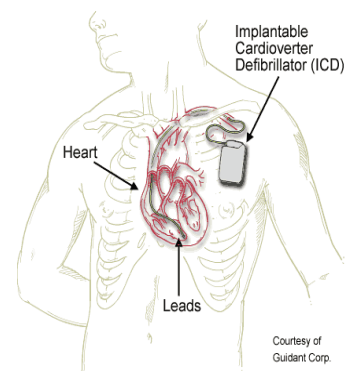
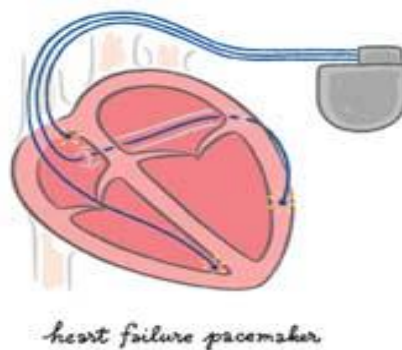
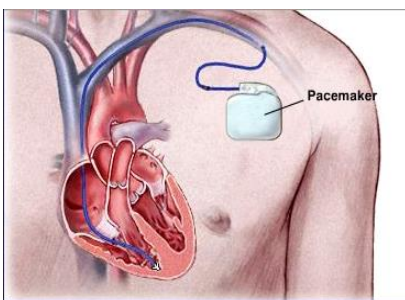
## Pacemakers/ICD/CRT-Defibrillator/CRT-Pacing

An artificial pacemaker is an electronic device, which produces an electrical stimulus, when the natural cardiac pacemaker fails. The artificial pacing system, whether temporary or permanent is an electrical circuit consisting of a power source and an electrode, which transports the impulse causing the cardiac cells to depolarise.

ICD's are an internal device like a pacemaker but its role is to shock a patient out of VT.

Cardiac Resynchronisation Therapy (much easier to remember as CRT) is a way of treating heart failure with an implantable device similar to a pacemaker. This heart failure pacemaker sends tiny electrical pulses to both ventricles (lower chambers) of the heart to make them beat together again in a more synchronized pattern. This improves the heart's ability to pump blood and oxygen to the body.

CRT, in combination with a complete program of therapy, has proven to improve the quality of life for many patients by reducing symptoms of heart failure, increasing exercise capacity and allowing them to resume many daily activities. It is not a replacement for drug therapy, and it is recommended that anyone choosing to receive CRT also continue taking medications as determined by a physician.



## Cardiac Surgery

The most common operations performed on the Cardiothoracic Unit are:

- Coronary Artery Bypass Grafts (CABG)
- Aortic or Mitral Valve Replacements (AVR/MVR) or repairs
- Atrial or Ventricular Septal Defects (ASD/VSD), they are either congenital or acquired
- Dissection repairs
- Aneurysm repairs
- Coarctation repairs (congenital)
- Rewiring of the sternum
- Insertion of a permanent Pacemaker (PPM)
- Tricuspid or Pulmonary Valve Replacements (TVR/PVR) or repairs, these are congenital problems.

## Cardiopulmonary Bypass

During operations to the heart and major vessels, a cardiopulmonary bypass pump is used to support the patient's circulation whilst the heart is 'out of action'. The term 'bypass' in cardiac surgery also refers to CABG; therefore the two must not be confused. A Perfusionist who is a qualified Doctor operates the cardiopulmonary bypass. It is used to take over both the pumping action of the heart, and the gaseous exchange function of the lungs.

In complex operations such as cardiac surgery the body's core temperature is reduced to approximately 28-32 degrees centigrade. This is done because the colder the body is, the less oxygen it requires to function hence reducing the risk of complications due to hypoxia. Cardioplegia, a solution of high concentration potassium is infused to arrest the heart in diastole to create a motionless surgical field. Mr Ohri does sometimes perform cardiac surgery without the use of cardiopulmonary bypass thus he operates on a beating heart.

Potential complications of cardiopulmonary bypass include:

- Bleeding from the cannulation site
- Arrhythmias
- Plaque disturbance during cannulation (leading to a CVA in some patients)
- Platelet depletion
- Air emboli
- Short term memory loss
- Poor concentration
- Reversible neurological problems are attributed to micro-emboli during cannulation of the arterial circulation.

## Coronary Artery Bypass Grafts

CABG are performed if medical treatment for angina fails or diagnosis through a cardiac catheter indicates a poor prognosis without surgical intervention e.g. significant stenosis in one or more of the coronary arteries, resulting in myocardial ischemia. The involved vessels are usually the LMS, LAD, Cx or RCA.

### Indications for CABG:

Angiographic diagnosis:

Elective surgery via the white board (on this admission)

Elective surgery via the waiting list (routine admission)



**Emergencies:**

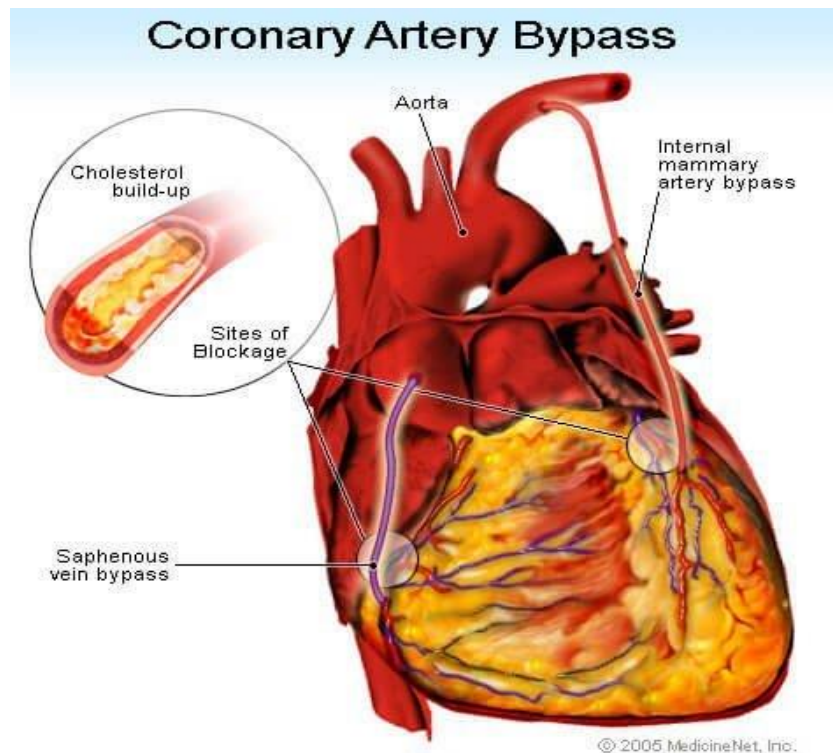
- Acute MI
- Failed PTCA/Stent (acute occlusion or dissection)
- Unstable angina
- Cardiogenic shock

**Surgical Procedure:**

CABG involve connecting a new conduit for blood flow from the aorta or the internal mammary artery (IMA) to the coronary artery distal to the occluded or stenosed area, thereby increasing the circulation to the myocardium and improving myocardial oxygen supply.

Vessels available for grafting are the *Saphenous Vein* (harvested from the leg), the *Radial Artery*, and either or both of the *IMA's* (Internal Mammary Artery). Wherever possible the left IMA is used to graft the LAD, as this is the most important coronary artery because it supplies the left ventricle. IMA grafts claim to have the best patency long term, which hopefully increases the patient's years of survival.

The difficulties of using the IMA are that it can be difficult to access and may increase the operating time. Also it can have an effect on the healing time because there is now a reduced blood supply to the chest wall. Single IMA grafting is now being performed off bypass wherever possible.

**Cardiac Valve Surgery**

Valvular disorders are conditions that cause abnormalities to cardiac valves and/or their supporting structures, resulting in mechanical dysfunction. Examples include aortic/mitral stenosis and aortic/mitral regurgitation. In the early stages of valve disease, symptoms can be controlled through medical management. Occasionally a valve repair can be performed but more commonly the valve is replaced.

**Indications for Valve Surgery include valve stenosis or regurgitation caused by one of the following;**

- Inflammatory process
  - Infective Endocarditis
  - Rheumatic Heart Disease
  - Acute Rheumatic Fever
  - Myocarditis
- Congenital malformation
  - Bicuspid Aortic Valve,
  - Mitral valve Prolapse,



## Transcatheter Aortic Valve Implantation (TAVI)

**TAVI** is an alternative to open heart surgery and is considered as a minimally invasive approach. This heart surgery can be performed using transoesophageal echocardiography and fluoroscopic guidance for visualization during implantation.

During the procedure a valve (Figure 1: a balloon expandable stent combined with a bovine pericardial bio prosthetic tissue valve) is reduced to size and placed on a delivery catheter (Figure 2).

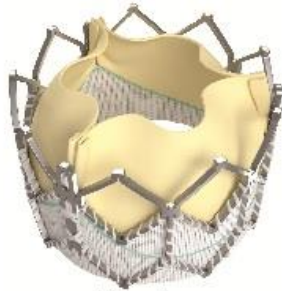


Figure 1



Figure 2

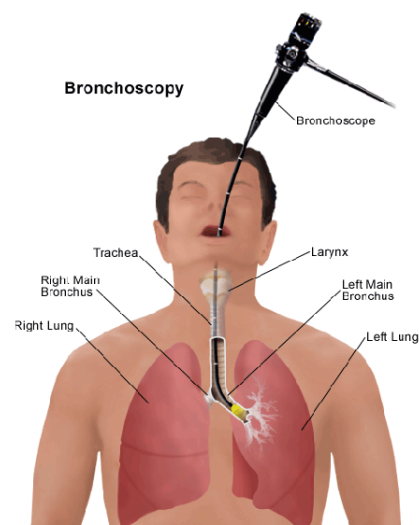
This procedure is recommended in patients with severe symptomatic AS who are, according to the ‘heart team’, considered unsuitable for conventional surgery because of severe comorbidities.” A heart team comprises of a 2 cardiologist, 2 surgeons, an imaging cardiologist and nurse specialist.

## Common Thoracic Conditions & Procedures

### Bronchoscopy

This technique is a means of visualizing the inside of the airways for diagnostic and therapeutic purposes. A bronchoscope is inserted into the airways usually through the nose or mouth, or on occasion it can be inserted into the airway via a tracheostomy. This allows the practitioner to examine the airways for abnormalities such as foreign bodies, bleeding, tumours or inflammation.

Specimens can be taken from inside the lungs. The construction of bronchoscopes ranges from rigid metal tubes with attached lighting devices to flexible optic fibre instruments with real time video equipment.



### Thoracoscopy

A thoracoscopy uses an endoscope to visually examine the pleura, lungs and mediastinum and to obtain tissue for testing purposes. An endoscope is an illuminated optic instrument that is inserted through an incision. This procedure is generally performed under a general anaesthetic and maybe used to gain lung/pleural biopsies, drain effusions and for insertion of sterile talc (see below).

When the procedure is finished, one or more tubes may be temporarily placed in the chest to drain fluid and air. The incisions are then closed with sutures or staples.



A Thoracoscopy may sometimes be performed in conjunction with a Talc Pleurodesis. A pleurodesis is a procedure designed to obliterate the pleural space in order to prevent recurrent pleural effusions or pneumothorax. The instillation of sterile talc serves as a chemical irritant which causes pleural inflammation and fibrosis.

### Pleurectomy

A Pleurectomy is a procedure to remove the lining between the lungs and the chest wall. It is used following recurrent episodes of collapsed lungs (spontaneous pneumothorax) to help the surface of the lung to stick to the chest wall and so preventing further lung collapse. It is performed under general anesthesia either as a VATS (video assisted technique – keyhole) or open procedure. Chest drains are inserted following the surgery to facilitate lung expansion.

### Bullectomy

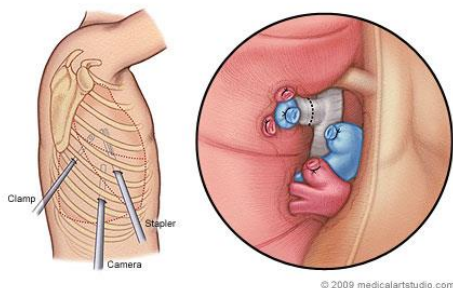
A bullectomy is the surgical removal of a bulla, or a thick-walled air space, that can be caused by emphysema, infection, or a congenital defect. While technically a bulla can occur anywhere in the body, they are most often associated with the lung. A bulla's size may vary, but they are generally between .25 inches (.635 cm) and .5 inches (1.27 cm). A surgeon may remove bulla from the lungs to encourage the healthy air sacs around it to expand, and allow the lung to function at a more efficient level. Bullectomies are merely a treatment, not a cure, for lung tissue damage caused by emphysema.

### Lung Resection

Updated September 2020 from original work completed by Student Link Nurses

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Portions of the lung or indeed the whole lung may be removed, usually for the removal of lung cancers. Historically this was achieved through a Thoracotomy (open approach) although now a day's some surgeons are able to offer lung resection through minimally invasive techniques (VATS surgery).



A lobectomy is the surgical removal of a lobe (i.e. section of a lung). It is one of the most common procedures done today to treat early-stage Lung cancer. With a VATS lobectomy, four incisions are made into the sides of the patient's chest. Three of the four incisions typically measure less than a single inch. The fourth incision may measure up to a few inches. There is no need to cut through the sternum or spread the ribs. The entire procedure is performed through these smaller incisions.

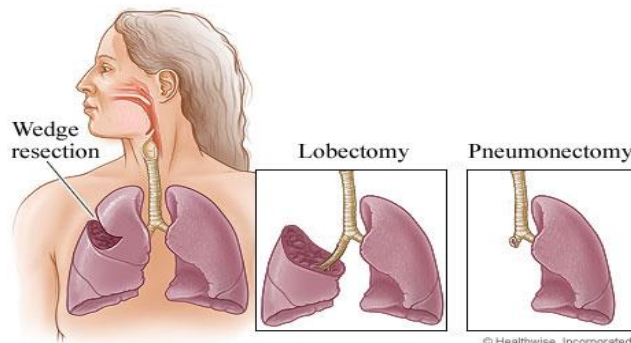
The surgeon will insert a thoracoscope and a few other surgical instruments through the incisions. The thoracoscope is equipped with a small light and camera. The camera transmits images back to a monitor used by the surgeon to see within the patient's thoracic cavity.

The tumour is cut away from the healthy tissue and extracted through one of the incisions. If the surgeon suspects the cancerous cells have spread to the nearby lymph nodes (i.e. the disease is in stage 2), some of them will be biopsied. This is done in order to verify or refute the spread of lung cancer to the lymph nodes.

Once the diseased tissue has been removed, the surgeon will make sure there are no signs of bleeding within the thoracic cavity. The four incisions are then closed and cleaned before the patient is transferred to the hospital's recovery ward.

Lung resection via a VATS approach does depend on the size, location and suspected spread of the cancer. It is therefore not a surgical technique offered to all patients. Advantages of VATS lobectomy over the traditional open approach include a shorter recovery time and a reduction in post-operative pain. The recovery period following a VATS lobectomy is usually less than six weeks. The patient will normally stay in the hospital for two or three days after undergoing surgery. Then, he or she is released to complete their recovery at home. By the fourth week, most patients are able to return to their normal activity levels, though some will require the full six weeks.

Removal of a whole lung is called a pneumonectomy and is a treatment option for those with larger tumours or tumours in a position whereby resection is unlikely through removal of part of a lung only. A pneumonectomy can only be completed via a Thoracotomy and a full assessment of a patient's lung function needs to be performed preoperatively to ensure that the patient can live with only one lung.

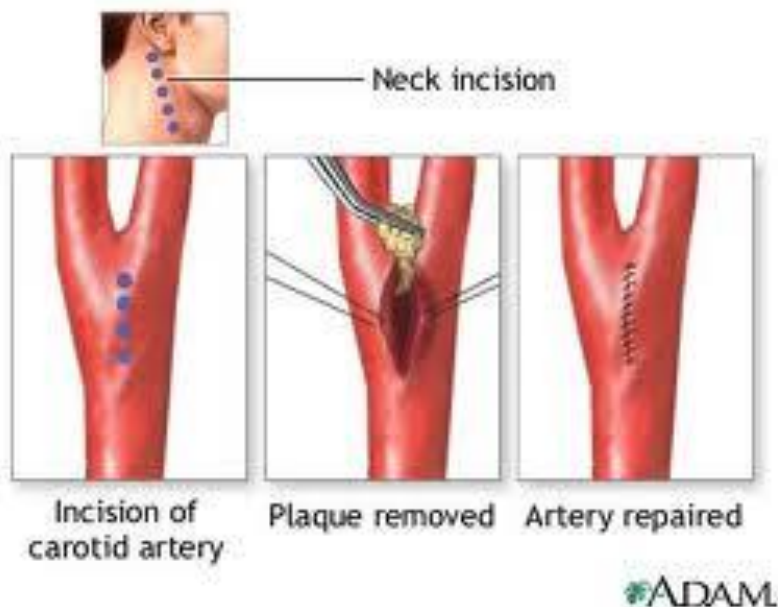




## Common Vascular Conditions & Procedures

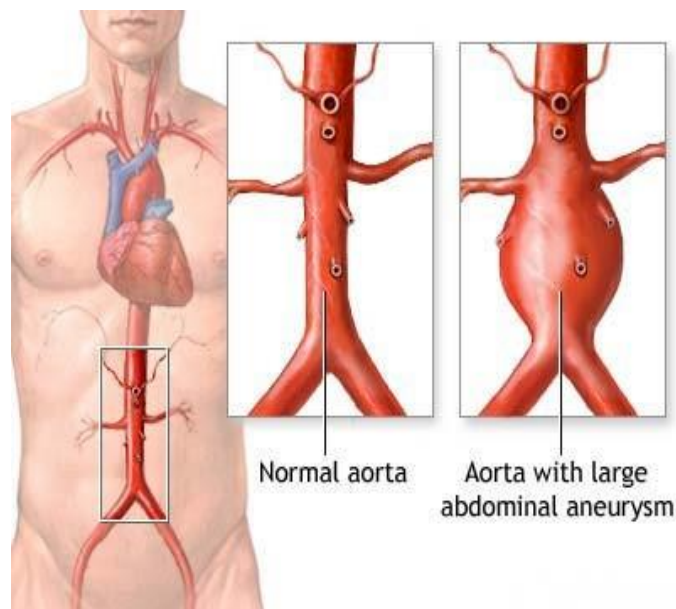
### Carotid Endarterectomy

This is a surgical procedure whereby a build-up of atherosclerosis in the common carotid artery is removed in order to reduce the risk of stroke and transient ischemic attacks. Complications of this surgery include stroke and bleeding.



### Aortic Aneurysm Repair

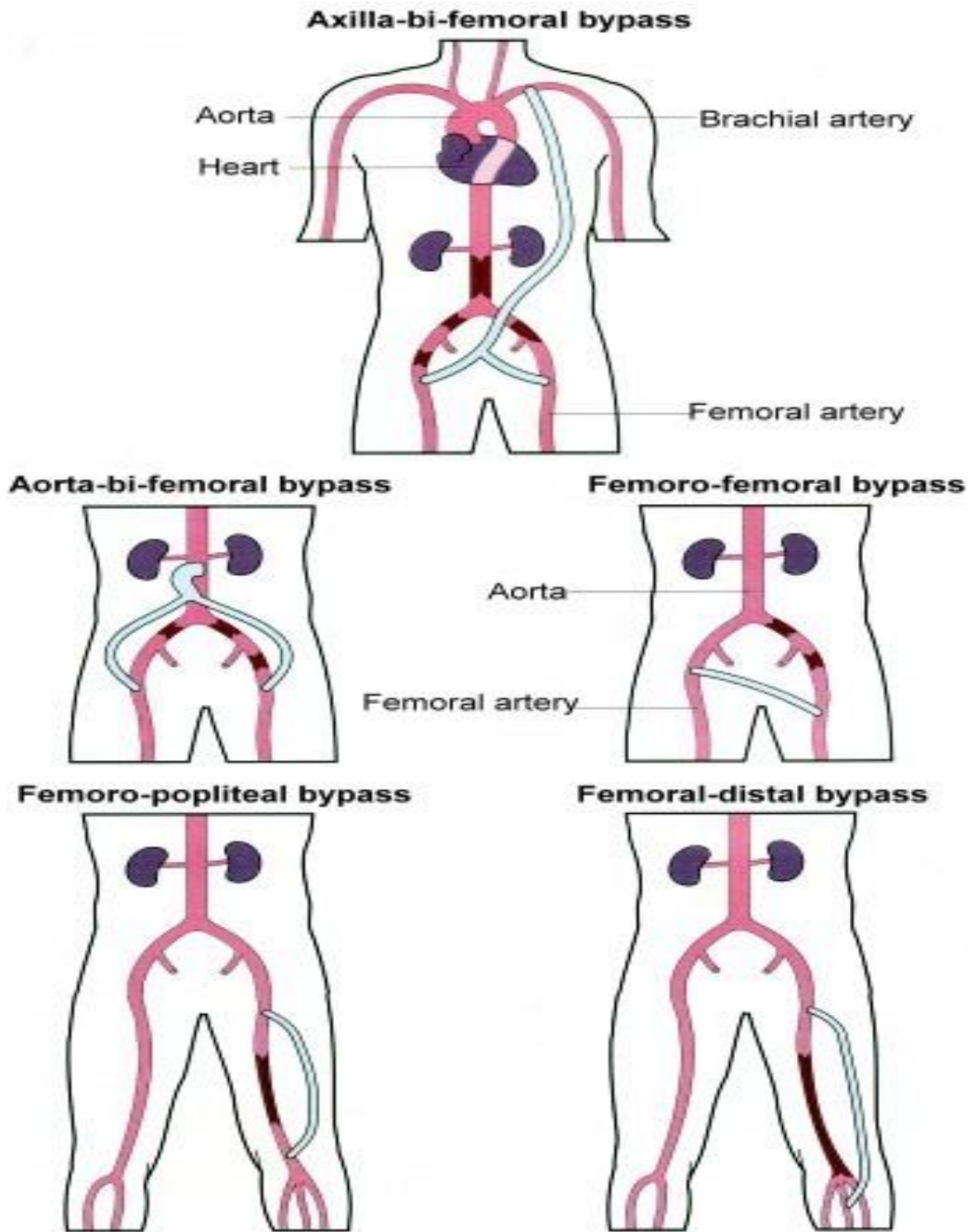
An aortic aneurysm is a dilation of the aorta that weakens the aortic wall and presents the risk of aortic rupture. It is a condition that is often found incidentally as it is usually asymptomatic. Work is ongoing to routinely screen the general population; those with an aortic aneurysm receive regular screening to monitor size. Surgery is generally indicated when the aneurysm is greater than 5.5 cm (normal aorta is 1.6 cm to 2.5 cm). Risk of mortality is < 5% with elective repair but this goes up to 80% if the aneurysm ruptures.



### Vascular Bypass Surgery

This surgery is performed for arterial occlusion or narrowing which is unresolved by angioplasty or stenting. Patients can present with intermittent claudication, non-healing arterial ulceration and/or rest pain or a cold, pulseless ischaemic limb. Patients will commonly experience calf, thigh and/or buttock muscle pain as due to insufficient O<sub>2</sub> to meet demands of exercising muscle. In chronic disease surgery is performed as a 'last resort' when:

- walking distance is life limiting i.e. 50-100 yards
- symptoms of critical limb ischaemia occur - rest pain, ischaemic toes, gangrene



## Common Abbreviations.

<b>AAA:</b>	Abdominal Aortic Aneurysm	<b>IHD:</b>	Ischaemic Heart Disease
<b>ABP:</b>	Arterial Blood Pressure	<b>IMA:</b>	Internal Mammary Artery
<b>ABPI:</b>	Ankle Brachial Pressure Index	<b>LA:</b>	Left Atrium
<b>ABG:</b>	Arterial Blood Gas	<b>LAD:</b>	Left Anterior Descending Artery
<b>AF:</b>	Atrial Fibrillation	<b>LMS:</b>	Left Main Stem Artery
<b>AKA:</b>	Above Knee Amputation	<b>L/R LL:</b>	Left/Right Lower Lobectomy
<b>AR:</b>	Aortic Regurgitation	<b>LV:</b>	Left Ventricle (refers to function)
<b>AS:</b>	Aortic Stenosis	<b>LVF:</b>	Left Ventricular Failure
<b>AVR:</b>	Aortic Valve Replacement	<b>MR:</b>	Mitral Regurgitation
<b>BBB:</b>	Bundle Branch Block	<b>MS:</b>	Mitral Stenosis
<b>BKA:</b>	Below Knee Amputation	<b>OM:</b>	Obtuse Marginal
<b>BP:</b>	Blood Pressure	<b>PAP:</b>	Pulmonary Artery Pressure
<b>CC:</b>	Cardiac Catheter	<b>PPM:</b>	Permanent Pacemaker
<b>CABG:</b>	Coronary Artery Bypass Graft	<b>PCI:</b>	Percutaneous Coronary Intervention
<b>CAD:</b>	Coronary Artery Disease	<b>PFT's:</b>	Pulmonary Function Tests
<b>CHD:</b>	Coronary Heart Disease	<b>PTCA:</b>	Percutaneous Transluminal Coronary Angioplasty
<b>Cx:</b>	Circumflex	<b>PVD:</b>	Peripheral Vascular Disease
<b>CVA:</b>	Cerebral Vascular Accident	<b>RA:</b>	Right Atrium
<b>DCM:</b>	Dilated Cardiomyopathy	<b>RCA:</b>	Right Coronary Artery
<b>DVT:</b>	Deep Vein Thrombosis	<b>RV:</b>	Right Ventricle
<b>ELVT:</b>	Endovenous Laser Therapy for Varicose Veins	<b>SBCA:</b>	Standby Coronary Angiography
<b>EF:</b>	Ejection Fraction	<b>SOB:</b>	Shortness of Breath
<b>EPS:</b>	Electrophysiological Studies	<b>SOBOE:</b>	Shortness of Breath on Exertion
<b>ETT:</b>	Exercise Tolerance Test	<b>SSG:</b>	Skin Graft
<b>EVAR:</b>	Endovascular Aneurysm Repair	<b>SVT:</b>	Supra Ventricular Tachycardia
<b>FB:</b>	Fluid Balance	<b>TKA:</b>	Through Knee Amputation
<b>FBC:</b>	Full Blood Count	<b>TOE:</b>	Trans Oesophageal Echo
<b>FOB:</b>	Faecal Occult Blood	<b>TR:</b>	Tricuspid Regurgitation
<b>HOCM:</b>	Hypertrophic Obstructive Cardiomyopathy	<b>VATS:</b>	Video-Assisted Thoracoscopy
<b>IABP:</b>	Intra-Aortic Balloon Pump	<b>VF:</b>	Ventricular Fibrillation
<b>ICD:</b>	Internal Cardiac Defibrillator	<b>VT:</b>	Ventricular Tachycardia
<b>IDDM:</b>	Insulin Dependent Diabetes Mellitus	<b>VV:</b>	Varicose Veins
<b>IE:</b>	Infective Endocarditis	<b>WPW:</b>	Wolfe Parkinson White Syndrome



## Cardiovascular & Thoracic Dictionary



### A

**ACE:** (Angiotensin converting enzyme) inhibitors: a type of heart failure medication that works by preventing the body from creating Angiotensin, a substance in the blood that causes vessels to tighten and raises blood pressure.

**Adrenaline:** an adrenergic hormone, which results in actions similar to those resulting from sympathetic nervous stimulation.

**Afterload:** aortic pressure or wall stress after systole has begun.

**Analgesia:** medication given for the relief of pain

**Aneurysm:** dilation of a blood vessel, usually an artery, due to a local fault in the vessel wall, through defect, disease or injury.

**Angina Pectoris:** chest pain associated with inadequate blood flow to heart muscle.

**Angiography:** demonstration. of the arterial system after injection of an opaque dye.

**Angioplasty:** plastic surgery of blood vessels – see percutaneous transluminal coronary angioplasty.

**Angiotensin:** an enzyme, which controls fluid balance and blood pressure in the kidneys.

**Angiotensin 11 receptor blocker:** a medication that blocks the action of a special chemical called Angiotensin, which normally raises the heart rate and blood pressure.

**Antibody:** an immunoglobulin, essential to the immune system, produced by the lymphoid tissue in response to bacteria, viruses or other antigenic substances.

**Anticoagulant:** drug that prevents blood clotting.

**Aorta:** largest artery in the body; carries blood from the left ventricle of the heart

**Aortic Arch:** one of the four portions of the aorta giving rise to three arterial branches: the brachiocephalic trunk, the left common carotid and the left subclavian arteries.

**Aortic Valve:** valve between the left ventricle of the heart and the aorta.

**Apex:** the tip or pointed end of a conical structure.

**Arrhythmia:** an abnormal heart rhythm caused by disturbances in the movement of electrical impulses through the heart.

**Arteriole:** a blood vessel between an artery and capillary; surrounded by smooth muscle; primary site of vascular resistance.

**Artery:** thick walled, elastic vessel that carries blood away from the heart.

**Atheroma:** deposition of hard yellow plaques of fatty material in the arteries.

**Atherosclerosis:** co-existing atheroma and other degenerative change in arteries. Primarily associated with the ageing process.

**Atrial fibrillation:** a cardiac arrhythmia marked by rapid randomized contractions of the atrial myocardium, causing a totally irregular, often rapid, ventricular rate.

**Atrioventricular node (AV node):** region at the base of the right atrium near the inter-ventricular septum containing specialized cardiac muscle cells through which electrical activity must pass to go from the atria to the ventricles.

**Atrioventricular valve (AV valve):** valve between the atrium and the ventricle of the heart; the AV valve on the right side of the heart is the tricuspid valve and that on the left is the mitral valve.

**Automaticity:** a property of specialized excitable tissue that allows self-activation through spontaneous development of an action potential, as in pacemaker cells of the heart.

### B

**Baroreceptor:** receptor sensitive to pressure and to the rate of change of pressure.

**Base of the heart:** portion of the heart opposite the apex directed to the right side of the body.

**Beta-adrenergic:** activation of beta-adrenergic receptors causes physiological reactions such as increase in the rate and force of cardiac contraction and relaxation of bronchial muscles.

**Beta Blockers:** medications that reduce the heart's tendency to beat faster by blocking specific receptors located on the cells that make up the heart.

**Bradycardia:** a heart rate less than 60 beats per minute.

**Bundle of His:** a single pathway of specialised conduction tissue, which allows rapid conduction from the AV node to the Purkinje fibres.

## C

**Calcium Channel Blocker:** a drug prevents calcium from entering the heart's muscle cells. This causes the muscles to relax, lowering the heart rate.

**Capillaries:** smallest type of blood vessel.

**Cardiac Cachexia:** the loss or wasting of body muscle tissue due to heart failure.

**Cardiac Output:** blood volume pumped by each ventricle per minute (not total output pumped by both ventricles).

**Cardiac Rehabilitation:** a supervised program of increasing exercise, mental support and training to allow a person with a heart condition to resume normal activities.

**Cardiomyopathy:** any weakening or deformity of the heart muscle that causes a decreased force of pumping. This leads to less efficient circulation of blood through the lungs and rest of the body.

**Carotid Endarterectomy:** surgical removal of an atheromatous plug in the carotid artery.

**Cholesterol:** a material found in animal tissues and various foods that is normally synthesized by the liver and is important as a constituent of cell membranes and precursor to many hormones. Its level in the bloodstream can influence development of atherosclerotic plaque.

**Circumflex Artery:** a subdivision of the left coronary artery.

**Claudication:** cramping pains in the muscles of the legs caused by an inadequate supply of blood to the muscles. Intermittent claudication is pain induced by exercise (walking) and relieved by rest.

**Congenital Heart Disease:** any heart condition or abnormality that a person was born with.

**Contractile (cells):** possessing the ability to shorten, usually when stimulated; special property of muscle tissue.

**Contractility:** the force of a myocardial contraction when preload and afterload are constant.

**Coronary Artery Bypass Grafts (C.A.B.G):** open heart surgery in which a section of a blood vessel is grafted onto one of the coronary arteries and connected to the ascending aorta to improve blood flow beyond an obstructed area.

**Coronary Heart Disease:** disease usually arising from progressive narrowing of the coronary arteries.

**Coronary Artery Disease:** a condition caused by thickening of the walls of the arteries that supply blood to the heart muscle. When these arteries become blocked, the heart is deprived of oxygen and can become damaged.

**Coronary Circulation:** the blood vessels supplying the heart muscle with oxygenated blood via the coronary arteries and removing deoxygenated blood via the coronary sinus.

**Coronary Sinus:** a wide venous channel (2.25cms) situated on the posterior surface of the heart into which drain five coronary veins.

## D

**Defibrillation:** procedure to correct life-threatening arrhythmia using direct current shock to the heart.

**Diastole:** the period of the cardiac cycle when the ventricles are not contracting.

**Diastolic Pressure:** the minimum level of blood pressure measured between contractions of the heart.

**Digoxin:** a medication that increases the force of the heart's contractions and slows certain types of irregular heartbeats (arrhythmia).

**Direct Current Cardioversion (DC/C):** the restoration of the heart's sinus rhythm by delivery of a synchronized electric shock through two metal paddles placed on the patient's chest.

**Diuretic:** a medication that promotes the formation and release of urine. It helps to reduce fluid overload.

**Doppler:** a machine used to detect blood flow within an artery or a vein through the use of ultrasonic waves.

**Duplex Scanner:** a technique that gives visual images of the arteries using a process similar to that of ultrasound.

**Dyspnoea:** shortness of breath.

## E

**ECG Exercise Test:** an exercise test performed whilst monitoring the electrical activity of the heart.

**Echocardiography:** the use of ultrasound as a diagnostic tool for studying the structure and motion of the heart.

**Ectopic Beat:** a premature contraction of the atria or ventricles, which is initiated outside the normal conduction system.

**Ejection Fraction:** the fraction of blood pumped out of the left ventricle with each contraction, determined by dividing stroke volume, then multiplying by 100.

**Electrocardiogram:** recording at skin surface of the electric currents generated by cardiac muscle action potentials.

**Electrolyte:** an element or compound that when melted/dissolved dissociates into ions and is able to conduct an electric current.

**Embolus:** solid body or air bubble transported in the circulation, e.g. pulmonary embolus (PE).

**End Diastolic Volume:** amount of blood in ventricle just prior to systole.

**Endarterectomy:** surgical removal of an atheromatous core from an artery.

**Endocarditis:** inflammation of the lining of the heart and the heart valves, usually due to bacterial infection.

**Endocardium:** the endothelial lining of the heart chambers and valves.

**Endothelium:** the layer of tissue, which forms the thin inner lining of blood vessels and heart chambers.

**Epicardium:** a thin, outer layer of the heart; also called the visceral pericardium.

**Erythrocytes:** red blood cells.

**Essential Hypertension:** hypertension of unknown cause.

## G

**GTN:** glycerol trinitrate; a drug, which dilates blood vessels to relieve angina.

## H

**Haemoglobin:** a complex protein – found in the blood that carries oxygen to the cells from the lungs and carbon dioxide away from the cells to lungs.

**Heart Failure:** a condition in which the heart cannot pump enough blood in relation to the venous return and the metabolic requirements of body tissues.

**Heart Murmur:** an abnormal heart sound caused by turbulent blood flow through narrowed or leaky valves or through a hole in the inter-ventricular or the inter-atrial septum.

**Heart Sounds:** noise that results from vibrations due to closure of the atrio-ventricular valves (first heart sound), and then the pulmonary and aortic valves (second heart sound).

**High-Density Lipoprotein:** a carrier protein for lipids such as cholesterol, which appears to offer some protection against atherosclerosis.

**Halter Monitoring:** ECG monitoring over a 24-hour period.

**Hypertension:** abnormally high blood pressure. There is no universal agreement about what constitutes normal levels, but a resting systolic blood pressure of 160mmHg and/or resting diastolic blood pressure of 90mmHg is usually regarded as hypertensive.

**Hypertrophy:** enlargement of tissue or an organ due to an increase in the size of its cells, rather than an increase in the number of cells.

**Hypoxia:** deficiency of oxygen at tissue level.

**Hypotension:** lower than normal arterial blood pressure.

**I**

**ICD:** a device implanted in the body that detects heart arrhythmias and counters them with an electric shock that resets the heart rhythm.

**ILR:** Implantable Loop Recorder (Reveal/LINQ)

**Inferior Vena Cava:** large vein that carries blood from the lower half of the body to the right atrium of the heart.

**Ischaemia:** rate of blood flow to any part of the body, which is inadequate to supply sufficient oxygen to maintain aerobic respiration.

**L**

**Left Anterior Descending Artery (LAD):** sub-division of the left coronary artery that supplies the anterior and lateral walls of the left ventricle.

**Left Atrium:** the left upper chamber of the heart, which receives oxygenated blood via the pulmonary vein.

**Left Ventricle:** the left lower muscular chamber of the heart, which pumps blood into the systemic circulation via the aorta.

**Leukocytes:** white blood cells.

**Lipids:** any of the free fatty acid fractions in the blood. They are stored in the body and serve as an energy reserve, but may be elevated in various diseases.

**Lobectomy:** removal of a lobe of a lung

**Low-Density Lipoprotein:** a plasma protein containing relatively more cholesterol and triglycerides than protein; it is believed to contribute to atherosclerosis.

**Lumen (vessel):** a cavity or channel within any organ or structure of the body.

**M**

**Mitral Valve:** valve between the left atrium and the left ventricle of the heart. **Myocardium:** the muscle of the heart.

**Myocardial Infarction:** death of heart tissue that results from insufficient blood supply to part of the myocardium.

**Myocardial Ischaemia:** a rate of blood flow to the heart muscle, which is inadequate to supply sufficient oxygen to maintain aerobic respiration in myocardial tissue.

**Myocarditis:** inflammation of the heart muscle.

**N**

**Necrosis:** localized death of tissue.

**Noradrenaline:** a neurotransmitter which is released from nerve endings and is a hormone released from the adrenal medulla; depending on target tissues its effect can be inhibitory or excitatory.

**O**

**Occlusion:** the closure of an opening.

**Oedema:** swelling of tissue due to fluid retention.

**Orthopnoea:** breathlessness, which requires an upright (sitting) position for its relief

**P**

**P wave:** part of the cardiac cycle comprising P, Q, R, S and T waves.

**Pacemaker:** the sinoatrial node is the natural pacemaker as it sets a rhythm of contraction and relaxation that is followed by a rest of the heart — the heartbeat. If the SA node fails then an electronic device can be fitted.

**Palpitations:** uncomfortable awareness of the heart beating

**Percutaneous Transluminal Coronary Angioplasty (PTCA):** a balloon is passed into a `blocked` coronary artery and inflated; it presses the atheroma against the vessel wall, thereby increasing the lumen.

**Percutaneous Coronary Intervention (PCI):** see PTCA

**Pericardium:** Connective tissue surrounding the heart.

**Peripheral Vascular Disease:** any abnormal condition that affects the blood vessels outside the heart and lymphatic vessels.

**Phlebitis:** inflammation of a vein.

**Pitting oedema:** swollen tissue due to fluid retention, which leaves an indentation when compressed.

**Plasma:** liquid portion of the blood; component of extra cellular fluid

**Pleural Effusion:** fluid around the pleura of the lungs.

**Pleurectomy:** Removal of parietal pleura

**Pneumonectomy:** removal of a whole lung

**Popliteal Artery:** a continuation of the femoral artery supplying various muscles of the thigh, leg and foot.

**Postural Hypotension (Orthostatic hypotension):** lower than normal arterial blood pressure occurring when an individual assumes an upright posture.

**Potassium:** a mineral, that together with sodium and calcium regulates the body's water balance, maintains normal heart rhythm, and is responsible for nerve impulses conduction and muscle contraction.

**Preload:** end diastolic pressure, volume or ventricular wall stress.

**Pulmonary:** pertaining to the lungs.

**Pulmonary Circulation:** blood flow from the heart to the lungs and from the lungs back to the heart

**Pulmonary Embolus (PE):** blockage of the pulmonary artery by foreign matter, e.g. fat, air, tumour tissue or a thrombus.

**Pulmonary Valve:** valve between the right ventricle of the heart and the pulmonary trunk

**Pulmonary Veins:** the blood vessels, which return oxygenated, blood from the lungs to the left atrium of the heart.

**Pulse:** the regular, recurrent expansion and contraction of an artery produced by the ejection of blood from the left ventricle of the heart on contraction.

**Purkinje Fibres:** specialized myocardial cell that constitutes part of the conducting system of the heart; conveys excitation from bundle branches to ventricular muscle.

## Q

**QRS Complex:** component of electrocardiogram corresponding to ventricular depolarization.

## R

**Refractory Period:** the time during which excitable membrane does not respond to a stimulus, the magnitude of which would normally be sufficient to elicit a response.

**Repolarisation:** the process by which the cell is restored to its resting potential.

**Residual Ischaemia:** persisting diminished blood supply to a body organ or part. Revascularisation: surgical procedure to restore blood supply to an area.

**Right Atrium:** the right upper chamber of the heart, which receives deoxygenated blood via the superior and inferior vena cava.

**Right Coronary Artery:** the artery, which supplies blood to the right ventricle and part of the posterior left ventricle.

**Right Ventricle:** the right lower chamber of the heart, which ejects deoxygenated blood into the pulmonary circulation via the pulmonary artery.

## S

**Segmentectomy:** removal of a segment of a lung

**Semi Lunar Valves:** crescent-shaped valves positioned at the entrances to the aorta and the pulmonary trunk.

**Septum:** a membranous or fleshy wall dividing to cavities.

**Sinoatrial Node (SA node):** region in the right atrium of the heart containing specialized cardiac-muscle cells that depolarize spontaneously and faster than other cells in the conducting system; determines heart rate.

**Sinus Rhythm:** normal rhythm of the heart in which electrical activity is originated at the Sinoatrial node.

**Sodium:** a mineral that regulates the body's water balance, maintains normal heart rhythm, and is responsible for nerve impulse conduction and muscle contraction. Excessive intake of sodium from food contributes to high blood pressure in some people.

**ST Segment:** the period between ventricular contraction and the return of the ventricles to a resting electrical state (Repolarisation) prior to the next wave of depolarization.

**Stent:** device to support body openings/cavities.

**Stroke Volume:** blood ejected by a ventricle during one heartbeat

**Superior Vena Cava:** large vein that carries blood from the upper half of the body to the right atrium of the heart.

**Sympathectomy:** division / destruction of sympathetic nerves to cause vasodilation and improvement of blood flow

**Systemic Circulation:** circulation from the left ventricle through all the organs except the lungs, and then back to the heart.

**Systole:** period of ventricular contraction.

**Systolic Blood Pressure:** maximum arterial blood pressure during the cardiac cycle.

## T

**TAVI:** Transcatheter Aortic Valve Implantation

**T wave:** part of the cardiac cycle comprising P, Q, R, S and T waves.

**Tachycardia:** a heart rate greater than 100 beats per minute.

**Thallium Scan:** scan of the heart muscle used to study blood supply.

**Thrombocytes (Platelet):** smallest cell in the blood; essential for coagulating the blood. Thrombolytics: pertaining to the dissolving of blood clots.

**Thrombus:** blood clot.

**Tricuspid Valve:** valve between the right atrium and the right ventricle of the heart.

## U

**Unstable Angina:** angina occurring at rest or with unpredictable onset.

## V

**Vagus Nerve:** the major parasympathetic nerve which originates in the cardio-inhibitory centre of the brain; vagal stimulation slows the heart.

**Valvotomies:** the incision into a valve to correct a defect and allow proper opening/closure.

**Varicose Veins:** dilated and tortuous veins in the legs caused by incompetent valves causing retrograde blood flow.

**Vasodilator:** a drug, which will widen the lumen of blood vessels by dilatation.

**Vasoconstriction:** The narrowing (constriction) of blood vessels. When blood vessels constrict, the flow of blood is restricted or slowed.

**Vasodilation:** increase in blood vessel diameter due to vascular smooth muscle relaxation.

**VATS:** Video assisted thoracoscopy

**Vein:** any vessel that returns blood to the heart.


**Venous Return:** blood volume flowing to the heart per unit of time.

**Ventricular Fibrillation:** cardiac arrhythmia marked by rapid, disorganised depolarisation of the ventricular myocardium; complete lack of organised electrical impulse, conduction and ventricular contraction.

## W

**Wedge Resection:** removal of a wedge of lung tissue

## Useful Websites

<a href="http://www.doh.gov.uk">www.doh.gov.uk</a>	Department of Health		
<a href="http://www.nhs.uk">www.nhs.uk</a>	National Health Service		
<a href="http://www.circulationaha.org">www.circulationaha.org</a>	Circulation		
<a href="http://www.mdchoice.com">http://www.mdchoice.com</a>	American websites offers ECG and weekly updates emails, and interactive related to emergency situations		of the month scenarios
<a href="http://www.bhf.org.uk">http://www.bhf.org.uk</a>	British Heart Foundation		
<a href="http://www.bcs.com">www.bcs.com</a>	British Cardiac Society		
<a href="http://www.bcis.org.uk">www.bcis.org.uk</a>	British Cardiac Interventional Society Coronary Prevention Group		
<a href="http://www.thelancet.com">www.thelancet.com</a>	The Lancet		
<a href="http://www.nice.org.uk">www.nice.org.uk</a>	National Institute of Clinical Excellence		
<a href="http://www.nmc-uk.org">www.nmc-uk.org</a>	NMC Standards/Professional Issues		
<a href="http://www.library.nhs.uk">www.library.nhs.uk</a>	The National Electronic Library for Health		
<a href="http://www.nursingtimes.net">www.nursingtimes.net</a>	Nursing Times Journal		
<a href="http://www.bhsoc.org">www.bhsoc.org</a>	British Hypertension Society		
<a href="http://www.chi.gov.uk">www.chi.gov.uk</a>	Commission for Health Improvement		
<a href="http://www.diabetes.org.uk">www.diabetes.org.uk</a>	Diabetes UK		
<a href="http://www.heartforum.org.uk">www.heartforum.org.uk</a>	National Heart Forum		
<a href="http://www.doh.gov.uk/nsf">www.doh.gov.uk/nsf</a>	National Service Framework		
<a href="http://www.stroke.org.uk">www.stroke.org.uk</a>	Primary Care Cardiovascular Society Stroke Association		
<a href="http://www.ecglibrary.com">www.ecglibrary.com</a>	ECG's		
<a href="http://www.resus.org.uk">www.resus.org.uk</a>	Resuscitation: Council:		

## **STUDENT VISITS**

### **CATHETER LAB**

Ring Cath Lab Reception – ext 4200

### **THEATRES**

Ring Theatre Education office on 4543 or email them on [TheatreEducators@uhs.nhs.uk](mailto:TheatreEducators@uhs.nhs.uk) and complete the online training, you will need to take certificate on the day.

### **CRITICAL CARE OUTREACH**

Email [Yvonne.Strathdee@uhs.nhs.uk](mailto:Yvonne.Strathdee@uhs.nhs.uk) or [Katherine.Edwards@uhs.nhs.uk](mailto:Katherine.Edwards@uhs.nhs.uk) to request a visit.

### **ACS.- Acute Coronary Syndrome**

Contact ACS nurse on call on the day and arrange to shadow them.

### **CARDIAC REHAB.**

Rehab nurses regularly visit the wards you can sit in with them when they are seeing patients on the ward.

### **CARDIAC WARDS.**

Contact individual ward about visit, may need to arrange to swap with one of their allocated students.

### **PHARMACY.**

Speak to ward pharmacist to arrange to spend some time with them during a shift.

### **SPECIALIST NURSES.**

Adult Congenital CNS  
Heart Failure CNS  
Cardiac Rhythm Management CNS  
Cardiac Nurse Practitioners  
Cardiac Surgery Case Managers  
Advanced Nurse Practitioners

Other members of the MDT e.g. ECHO techs / Physios / other Specialist Nurses, come to the ward. Please liaise with them and your supervisor to shadow them when on the ward.



**Student Contact Details**

Please complete the following information and give it to your Practice Assessor or the student link nurse of your clinical area as soon as your placement commences.

Please note: if you do not attend work as rostered and you have not contacted the placement area to alert them that you will not be present for the shift, we will initially contact you on the numbers given. If we are unable to get hold of you, we will then use the other numbers given in addition to contacting your academic tutor.

**Student Contact Details**

<b>Clinical Placement</b>	
<b>Student Name</b>	
<b>Placement Number &amp; Start Date</b>	
<b>Contact Numbers &amp; Home Address</b>	<b>H:</b> _____ <b>M:</b> _____ <b>Address:</b> _____
<b>Name and Contact Details of person to contact in an event of an emergency or if we are unable to contact you:</b>	
<b>Academic Tutor &amp; E-mail Address</b>	
<b>Student Signature</b>	