Appendix 2: Vascular Surgery Syllabus

Within Vascular Surgery, the syllabus is presented as topics, each with objectives incorporating the knowledge, clinical and technical skills required to deliver the Vascular Surgery day-one consultant. The delivery of the objectives will be developed through the two phases of training and assessed within the CiPs and GPCs high-level outcomes. In addition, to ensure the appropriate procedural and clinical competence, there are nominated index procedures (appendix 4) that will require assessment through PBAs and critical conditions (appendix 3) that will require assessment through CBDs or CEXs as appropriate. Other than for the critical conditions, index procedures or where they have been identified to address a concern, WBAs are optional for formative feedback and, therefore, trainees do not need to use WBAs to evidence learning against each syllabus topic.

The delivery of the training of all components of the Vascular Surgery curriculum will be quality assessed by the Vascular Surgery Specialty Advisory Committee (SAC) as explained in appendix 7.

The Curriculum has been agreed in collaboration with the specialty of Interventional Radiology, within the Royal College of Radiologists, with agreement to deliver the endovascular training alongside Vascular Surgery, utilising a collaborative working model to the benefit of the trainees in both specialties, so promoting the MDT working of day-one consultants.

The syllabus objectives are the guide to the breadth and specifics of the indicative knowledge and skills required to acquire certification within Vascular Surgery.

Vascular Surgery Generic Topics		
	Phase 2	Phase 3
VASCULAR ANATOMY		
OBJECTIVES		
To understand and interpret the anatomy and embryology of the vascular system, in order to recognise and act upon variation or abnormality, alongside an understanding of the peripheral nervous system.	*	*
To be able to relate anatomy findings on examination to imaging and to operative findings and so plan management.	*	*
To be able to palpate the abdominal aorta and peripheral pulses and explain examination findings and anatomy to both patients and colleagues.	*	*
VASCULAR PHYSIOLOGY		
OBJECTIVES		
To be able to interpret and manage vascular physiology inclusive of blood flow and pressure, haemostasis, haemorrhage, ischaemia and reperfusion.	*	*
To be able to interpret the microcirculation, venous and lymphatic perfusions.	*	*
To obtain a detailed knowledge of vascular physiology in order to manage patients through major vascular interventions inclusive of cardiac, respiratory and renal monitoring / support.	*	*
To be able to manage all aspects of prophylactic and therapeutic anticoagulation inclusive of the ability to correct clotting abnormalities when intervention is required.	*	*
To be able to explain vascular physiology to both patients and colleagues.	*	*

VASCULAR PATHOLOGY		
OBJECTIVES		
To be able to recognise, prioritise and manage the diseases of the circulation, both congenital and acquired.	*	*
To have a detailed knowledge of atherosclerosis and its associated risk factors, venous disease, lymphatic disease, thrombo-embolic disease, vasospastic and vasculitic disease, along with an understanding of the mechanisms of vascular trauma.	*	*
To be aware of the causes of peripheral neuropathy and of other causes of limb pain (neurological and musculoskeletal).	*	*
To be able to take a detailed patient history of arterial or venous disease and be able to undertake the relevant examinations of ischaemia, aneurysmal disease, leg swelling and varicose veins.	*	*
To be able to detect pathological arterial and venous abnormalities and so prioritise those needing urgent treatment.	*	*
To be able to select the appropriate investigations and also explain vascular disease to patients and colleagues.	*	*
To be able to select and then undertake clinical investigations inclusive of both handheld doppler and duplex ultrasound assessment of varicose veins. To also undertake Ankle Brachial Pressure Indices and interpret the waveforms.	*	*
VASCULAR EPIDEMIOLOGY		
OBJECTIVES		
To understand the principles of vascular epidemiology, including basic study design and the interactions with major risk factors for arterial and venous disorders.	*	*
To understand the epidemiology of peripheral arterial disease, venous disorders including varicose veins and venous thromboembolism, and so be able to explain the epidemiology and interactions of major vascular risk factors (including smoking demographics) to patients.	*	*
SCREENING AND SURVEILLANCE		
OBJECTIVES		
To have knowledge of the key elements of design and delivery of screening tests in general and of AAA screening, EVAR/TEVAR follow-up and bypass graft surveillance in particular.	*	*
To be able to counsel a patient undergoing surveillance or who has a positive screening test.	*	*
To be able to undertake the measurement of AP AAA diameter on US scan in the out-patient clinic to monitor growth.	*	*
RISK FACTOR MODIFICATION		
OBJECTIVES		
To have full knowledge of vascular risk factors and risk-factor modification inclusive of lipid modification, smoking cessation and all drug interactions.	*	*
To be able to explain the rationale to patients and effect appropriate risk-factor modification.	*	*

To have a full understanding of the management of; blood pressure control, lipid lowering therapy, diabetes control, smoking cessation, antiplatelet and anticoagulation therapy. To be able to utilise this in providing counselling or advice to patients.	*	*
To have a full understanding of exercise and exercise therapy, along with dietary factor management within weight control.	*	*
To be able to interpret the guidelines for hypertension and hyperlipidaemia management.	*	*
To be able to undertake diabetes control peri-procedures, inclusive of setting up a sliding scale.	*	*
VASCULAR CONDITIONS OF CHILDHOOD		
OBJECTIVES		
To understand the surgical principles in childhood and apply these to the management of the vascular conditions of childhood (including trauma and vascular anomalies) Haemangiomas, venous malformations, AV malformations and lymphatic malformations.	*	*
To be able to obtain a full history and examination of children incorporating communication with parents and/or carers. To be able to examine vascular abnormalities and utilise the appropriate investigation modalities in order to plan the appropriate management strategy - (medical (including, compression), endovascular and surgical.)	*	*
To understand and recognise the roles for open, endovascular and medical treatment for paediatric vascular conditions and be able to safely apply this knowledge in the assessment and treatment of emergency paediatric conditions in the presence/ or with the help of a consultant colleague. This would allow for arterial repair (such as following a supracondylar fracture) and the provision of vascular access in a child.	*	*
NUTRITION		
OBJECTIVES		
To be able to recognise and assess nutritional requirements of the patient and appropriate routes of administration of nutrition, inclusive of artificial nutritional support where appropriate.	*	*
To understand the methods of screening and assessment and the effects of malnutrition on the patient (both excess and depletion).	*	*
To understand the role of nutritional support and access to this via the nutritional team, including the options for dietary supplements, and both enteral or parenteral nutrition.	*	*
To be able to provide the access for feeding at operation with placement of NG - feeding tubes or recognise the requirement of collaboration to provide naso-jejunal or direct feeding jejunostomy access.	*	*
To be able to utilise imaging to insert both tunnelled (Hickman or Port) and un-tunnelled central venous catheters. To be able to provide a service to remove these.	*	*

CARDIO-RESPIRATORY DISEASE		
OBJECTIVES		
To be able to undertake the assessment and management of patients with co-existent cardiac and/or respiratory disease, especially relating to the prognosis and impact on patients undergoing major vascular surgery.	*	*
To have full knowledge of the heart and lung anatomy and physiology. To be able to utilise this to understand the pathology (IHD, MI, heart failure, COPD, ARDS) and how this effects the prognosis / has impact upon patients undergoing major vascular surgery.	*	*
To be aware of the therapeutic options / the pharmacology and drug interactions / the current resuscitation guidelines and the indications for/ the haemodynamic consequences of positive pressure ventilation.	*	*
To be able to obtain a full examination of the heart and lungs and so select who requires pre-operative investigation (including indications for CPEX).	*	*
To be able to interpret those results and determine which patients are unsuitable for vascular intervention	*	*
To be able to undertake the adjunctive procedures of arterial blood gas sampling and interpretation along with obtaining arterial line access.	*	*
To be able to undertake the basic management of an acute Myocardial Infarction and heart failure along with leading a cardiopulmonary resuscitation.	*	*
To be able to provide acute respiratory support with the insertion and management of a chest drain. To then understand the process of respiratory support and the role of all forms of tracheostomy.	*	*
HAEMATOLOGY		
OBJECTIVES		
To be competent in relevant aspects of blood transfusion, bleeding disorders and drugs that affect clotting and have an understanding of the methods of blood conservation including pre-donation and intra-operative cell salvage.	*	*
To understand the coagulation and fibrinolysis pathways (including coagulation factors and their side effects) in order to interpret laboratory results.	*	*
To understand the epidemiology, natural history, and molecular basis of haemophilia and thrombophilia.	*	*
To understand the pharmacology of unfractionated heparin, LMWH, warfarin and antiplatelet agents.	*	*
To understand principles of donor selection and preparation of blood components including donor selection, preparation of blood products and viral safety.	*	*
To understand the principles of clinical blood transfusion including hazards of blood transfusion, SHOT report and the role of the hospital transfusion	*	*

committee.		
To understand the mechanism of DIC, effect of massive transfusion, renal and hepatic disease.	*	*
To understand and utilise the methods and complications of reversing anti-coagulation in patients with and without haemorrhage.	*	*
To understand and utilise the management of haemophilia and thrombophilia in terms of treatment and prophylaxis before vascular surgery.	*	*
To be able to initiate and monitor anticoagulation, and/ or antiplatelet therapy. This includes the intra-operative use of heparin, it's monitoring (i.e. by TEG or ACT) and the reversal using protamine.	*	*
To be able to use blood and blood products appropriately and manage the complications of blood transfusion.	*	*
CLINICAL AUDIT, RESEARCH & HEALTH ECONOMICS		
OBJECTIVES		
To understand the relevance of clinical audit, research and health economics to the practice of vascular surgery. To understand how the data of the National Vascular Registry is interpreted and supported by an evidence-based vascular practice. Then to be able to explain the principles of this to patients, colleagues and managers.	*	*
To understand the principles of audit, quality control, clinical research and systematic review.	*	*
To have knowledge of key health economic terms.	*	*
To understand the importance of generic QoL tools for venous and arterial disease, along with understanding the relevance of QALYS and calculation of incremental cost effectiveness ratios.	*	*
To understand planning and budgeting of vascular services along with the relevant types of health economic analysis.	*	*
To participate in local and national audit of outcomes, to conduct morbidity and mortality meetings and journal club learning.	*	*
To participate in clinical research.	*	*
To present at Vascular meetings (e.g. VSGBI, ESVS and SVS).	*	*
To publish in Vascular journals (e.g. EJVES and JVS).	*	*
OUTPATIENT, WARD and MDT MEETINGS		
OBJECTIVES		
To assess individual vascular outpatients and inpatients. Manage an outpatient clinic, ward round and MDT meeting and be able to undertake inter and multi-disciplinary working for operative and interventional cases.	*	*
To undertake individual patient assessment, focused history taking and examination, utilising the relevant vascular anatomy, physiology and clinical knowledge. To be able to organise the appropriate investigations.	*	*

, To have an understanding of hospital organisation, of multi-disciplinary teams and meetings, of the relevant guidelines for vascular disease management in both outpatient and inpatient services.	*	*
To undertake the management of an outpatient clinic, ward round and MDT meeting; to undertake the presentation of patients on ward round and at MDT; to have the ability to allocate management of patients to appropriate team members; to have the ability to make appropriate referrals to other specialists where indicated and the ability to liaise with critical care and other support services (e.g. pain team, physiotherapy, rehab).	*	*
Within the management of an outpatient clinic, ward round and MDT meetings, to have the ability to prioritise urgent patient appointments, investigations and interventions, then produce prompt and clear clinic letters and discharge summaries.	*	*

Vascular Surgery Imaging		
	Phase 2	Phase 3
PRINCIPLES OF VASCULAR IMAGING		
OBJECTIVES		
To have competency in radiation safety with understanding of the principles and indications for vascular imaging. To have undertaken appropriate training at Specialty Induction (at ST3) and at trust level and supported by British Institute of Radiology e-learning, in order to have appropriate IRMER certification to undertake procedures.	*	*
To understand the dangers of ionizing radiation and safe practice, with full awareness of the regulations and requirements of usage, inclusive of how ionizing radiation is monitored and how exposure can be reduced.	*	*
To understand the principles of ultrasound, CT and MR imaging and catheter angiography, the indications and factors determining appropriate investigation for a patient with vascular disease and all aspects of vascular contrast agents and associated hazards.	*	*
To be able to explain to patients the various imaging modalities, to select the appropriate investigations, evaluate the patient prior to the investigation / or procedure and identify any factors that increase risk for the patient.	*	*
VASCULAR ULTRASOUND		
OBJECTIVES		
To understand and be able to perform basic vascular ultrasound. With an understanding of the principles and limitations of ultrasound scanning along with the ability to interpret vascular ultrasound imaging.	*	*
To understand ultrasound spatial resolution in relation to scan plane and the requirements for imaging different vascular territories. Subsequently, to be able to explain vascular ultrasound and its findings to patients.	*	*

To undertake Vascular Ultrasound to allow the delivery of a Vascular Surgery outpatient practice in being able to choose the appropriate probe, to optimise the grey scale and colour flow imaging along with optimising pulsed wave settings. This is in order to assess and plan treatment of superficial venous disease and screen and assess growth of AAA.	*	*
To undertake Vascular Ultrasound to allow the delivery of Vascular Surgery procedures by being able to undertake intra-operative arterial quality control assessments and allow control of percutaneous venous and arterial punctures.	*	*
COMPUTED TOMOGRAPHIC IMAGING		
OBJECTIVES		
To understand, interpret and manipulate CT imaging and CT angiography in order to manage vascular patients and plan vascular treatment. To be able to manage vascular patients by being able to discriminate vascular pathology from normal cross-sectional appearance.	*	*
To understand how CTA images are generated in order to be able to interpret vascular pathology. This includes the concept of helical, multi-slice scanning, scanning in the axial plane and CT spatial resolution in order to generate vascular imaging.	*	*
To recognise X-ray dose and risks associated with study.	*	*
To recognise the need to tailor individual scans to the vascular presentation e.g. AAA elective vs. emergency, mesenteric/renal, carotid, peripheral, venous.	*	*
To understand the basic principles of vascular image reformatting in various planes, of image reconstruction and MIP images. To understand the common artifacts that effect these. This is to allow manipulation of images on the console and to be able to make measurements to appropriately plan and undertake the treatment of vascular patients.	*	*
To understand the use of intra-vascular and oral contrast agents, along with the risks of intra- vascular contrast and how to avoid these. Subsequently, to be able to explain the CT scan and the risks to a vascular patient. To be able to manage contrast reactions should they occur.	*	*
MAGNETIC RESONANCE IMAGING		
OBJECTIVES		
To understand, interpret and manipulate MR imaging and MR angiography in order to manage vascular patients and plan vascular treatment. Inclusive of recognising the risks of MR in vascular patients and be able to explain these and the role of MRA to patients.	*	*
To be able to manage vascular patients by being able to discriminate vascular pathology from normal cross-sectional appearances on MRA.	*	*
To understand how MRA images are generated in order to be able interpret vascular pathology. To appreciate the planes used along with spatial resolution and thereby be able to manipulate images on the console. Thereby to be able to understand the appropriate measurements of blood vessels in order to be able to plan vascular treatment of patients.	*	*

To recognise the need to tailor individual scans to clinical problems e.g. AAA elective vs. emergency, mesenteric/renal, carotid, peripheral, venous.	*	*
To understand the principles of both contrast and non-contrast angiographic techniques in vascular patients, the reformatting of images in various planes, of image reconstruction and MIP images, along with the effect of common artefacts.	*	*
To understand the different types of MR angiographic contrast.	*	*
CATHETER ANGIOGRAPHY		
OBJECTIVES		
To understand and perform intra-operative catheter angiography, with knowledge of the contrast agents, including CO2 and the risks of angiography. The teaching of this topic will be collaborative between vascular surgery and interventional radiology balanced by the requirements for reciprocal training in each specialty practice. It will utilise simulation and be initiated at specialty induction.	*	*
To understand the techniques of road-mapping, parallax, measurement, hand and power injection. To understand, and where required undertake intra-operative pressure measurements.	*	*
To understand measures to improve angiographic imaging e.g. breath holding, multi-masking, centring, collimation, frame rate, antegrade etc and thereby to keep radiation dose to the minimum required.	*	*
To understand the guidewire, catheter, introducer, dilator and sheath types, characteristics and indications, in order to obtain secure vascular access with a sheath, to position a guidewire using fluoroscopy, to place a non-selective catheter in aorta and flush the catheters and sheaths appropriately.	*	*
To understand the commonly used intra-operative arterial and venous access sites and so undertake femoral artery punctures both open and ultrasound guided. To subsequently be able to obtain satisfactory intra-operative angiograms and recognise an inadequate study with the need for alternative angiographic views.	*	*
To be able explain catheter angiography and the risks to a patient for the process of consent.	*	*

VASCULAR SURGERY Generic Procedures 1		
	Phase 2	Phase 3
OPEN VASCULAR SURGERY		
OBJECTIVES		
To gain open vascular surgical knowledge and skills in order to optimally manage vascular patients.	*	*

To know the importance of pre-operative checks and team briefing for patient safety.	*	*
To understand antibiotic prophylaxis and anticoagulation.	*	*
To understand blood transfusion and the management of transfusion-related complications.	*	*
To understand intra-operative cell salvage and the use of other blood products.	*	*
To understand the principles of local anaesthesia and local blocks e.g. metatarsal.	*	*
To know the common vascular skin incisions and exposures.	*	*
To understand the different methods of vascular control.	*	*
To understand the principles of vascular reconstruction.	*	*
To know the interventional options for varicose veins.	*	*
To understand the process of amputation level selection.	*	*
To know the types and characteristics of bypass grafts, anastomoses, and vascular sutures.	*	*
To know the types, characteristics and uses of vascular instruments.	*	*
To be able to explain open vascular surgery and the risks to a patient.	*	*
To demonstrate good patient, personal and team safety.	*	*
To ensure good asepsis, especially when prosthetic materials are involved.	*	*
To undertake good communication with patients and all members of the theatre team.	*	*
To produce accurate procedural records and post-procedural instructions.	*	*
To be able to plan and undertake appropriate wound debridement, and be able to manage the wound thereafter.	*	*
To be able to undertake Foot debridement inclusive of Digital and Ray amputations.	*	*
To be able to undertake the common major amputations, inclusive of trans-metatarsal/ trans-tibial (Burgess and Skew techniques)/ through knee and above knee amputations. Also to understand the prosthetic options for each of these operations.	*	*
To understand the indications for hindquarter amputations and, due to their rarity, be able to undertake this with a consultant colleague.	*	*
To be able to harvest superficial veins safely, without damage and then prepare for use as an arterial conduit. To understand the techniques / consequences of deep vein harvesting and due to their rarity, be able to undertake this with a consultant colleague.	*	*
To be able to undertake exposure and control of veins, such as the sapheno-femoral junction.	*	*
To be able to undertake exposure and control of arteries such as the common femoral artery, and understand the additional adjuncts for control.	*	*
To develop the open operative skills to be able to; 1: undertake an arteriotomy, 2: repair an arterial wall either directly or by patch repair and 3: go on to perform an anastomosis (both end-to-end and end-to-side).	*	*

To be able to manage acute presentations by embolectomy and go on to utilise on table angiography both diagnostically and as quality control. To be able to undertake thrombolysis if indicated, by catheter or via open arteriotomy and be able to manage the complications of this.	*	*

VASCULAR SURGERY Generic Procedures 2		
	Phase 2	Phase 3
<u>ENDOVASCULAR PROCEDURES</u>		
OBJECTIVES		
To be able to gain endovascular knowledge and skills in order to optimally manage patients within all aspects of vascular surgery. To be able to explain the respective roles, advantages, disadvantages, risks and benefits of endovascular options within the spectrum of options available to treat vascular disease to a patient in order to be able to make management recommendations and to be able to undertake full consent. To be able to work collaboratively with allied healthcare colleagues, inclusive of interventional radiology, radiographers, and vascular scientists, to facilitate multidisciplinary decision making.	*	*
To be able to explain the equipment, processes, procedures, and augmentations available to optimise imaging and outcomes in endovascular therapy.	*	*
To be able to recognise complications of endovascular treatment and to be able to explain the procedures, risks and benefits of endovascular rescue options and their role in relation to open surgical rescue options.	*	*
To be able to undertake pre-operative checks and team briefing, demonstrating good patient, personal and team safety. To understand the equipment required (i.e. catheter, sheath, guidewire, balloon and stent) inclusive of the different types, their indications and characteristics, such that can incorporate their usage within a practice appropriate for a day 1 consultant in vascular surgery.	*	*
To be able to undertake endovascular procedures via percutaneous or open surgical approaches whilst under the supervision of a vascular surgeon and/or interventional radiologist.	*	*
To have been supervised undertaking the component endovascular skills inclusive of; the usage of a closure device, the ability to pass a catheter into a vessel and manipulate a guidewire across a stenosis with a view to providing angioplasty and stenting.	*	*

Vascular Surgery Disease Specific Topics	Phase 2	Phase 3
ACUTE LOWER LIMB ISCHAEMIA		
OBJECTIVES		
To have the ability to recognise all presentations of acute lower limb ischaemia (Embolism, Thrombosis, trauma (blunt and penetrating) and fracture / dislocations) and institute emergency management. To be able to work collaboratively with the trauma team when required.	*	*
To understand the pathophysiology of acute limb ischaemia and compartment syndrome, through a full knowledge of lower limb arterial anatomy and neurology. To be able to obtain a full history and accurate examination.	*	*
To understand the investigation options and rationale for use. Including Doppler/ Duplex, Angiography, Intra-operative angiogram, compartment pressures, ECG and Echocardiogram.	*	*
To understand the management options and instigate the most appropriate (inclusive of Conservative, Endovascular Embolectomy, Open Embolectomy, Thrombolysis or Primary amputation).	*	*
To be able to undertake and interpret hand-held doppler assessments.	*	*
To be able to utilise and (where able to be reviewed) undertake arterial assessment of acute ischaemia.	*	*
To be able to undertake and interpret the measurement of lower limb compartment pressures.	*	*
In acute cases to be able to undertake the surgical approaches to the arterial tree and obtain surgical control of the lower limb blood vessels.	*	*
To be able to undertake an embolectomy (blind and directed/ over the wire) from femoral and popliteal access. To be able to quality control by undertaking on-table angiography and if necessary proceed to surgically/ catheter directed thrombolysis.	*	*
To be able to undertake emergency arterial reconstruction, utilising shunts where required. Subsequently be able to undertake emergency venous control and reconstruction.	*	*
To be able to undertake lower limb fasciotomies to prevent or treat lower limb compartment syndrome.	*	*
VASCULAR TRAUMA		
OBJECTIVES		
To undertake the identification, assessment and management of injuries to blood vessels (penetrating, blunt and iatrogenic) and associated injuries relative to fractures, nerves and associated structures.	*	*

To understand the pathophysiology of trauma, muscle ischaemia, shock lung and A-V Fistula and then how to investigate for bleeding and ischaemia (Duplex, CTA, on-table arteriography).	*	*
To understand and initiate the operative approach to specific injuries (cervical, thoracic, abdominal, limb) inclusive of where combined arterial and venous or involved fractures and nerve injuries.	*	*
To be able to recognise the signs and symptoms of acute arterial / venous injury, undertake the assessment of a multiply injured patient and investigate appropriately.	*	*
To be able to manage the systemic effects of arterial trauma (e.g. rhabdomyolysis).	*	*
To be able to utilise endovascular skills to aid intra-operative management (on table angiography) and have understanding of the usage of the adjuncts of balloon control, embolisation and covered stents to gain control of haemorrhage.	*	*
To be able to utilise open surgical skills to arrest haemorrhage by pressure, packing or with use of a tourniquet.	*	*
To be able to manage chest trauma inclusive of being able to recognise and treat a sucking chest wound, be able to insert a chest drain and with assistance be able to undertake an emergency thoracotomy.	*	*
To be able to undertake all aspects of vascular trauma, with the ability to obtain proximal control (either by clamp or balloon occlusion), understand when an artery can be ligated and be able to do so.	*	*
To be able, in a trauma case, to utilise the skills of lateral suture repair, end to end anastomosis, interposition grafts and the formation of panel / spiral grafts.	*	*
CHRONIC LOWER LIMB ISCHAEMIA		
OBJECTIVES		
To be able to undertake the management of the chronically ischaemic lower limb, inclusive of intervention, the role of medical treatment/exercise therapy and wound dressings & VAC.	*	*
To understand the pathology of atherosclerosis, thrombosis, and their complications along with non –atherosclerotic arterial conditions (e.g. fibromuscular dysplasia, Buerger's disease, vasculitis, and pyoderma gangrenosum).	*	*
To understand the presence of Vascular anomalies (e.g. persistent sciatic artery, cystic adventitial disease and popliteal entrapment).	*	*
To be able to select the appropriate method of revascularisation or level of amputation.	*	*
To be able to manage all postoperative wound infection and graft complications. To then be able to plan appropriate follow-up and graft surveillance.	*	*
To understand and be able to initiate the rehabilitation requirements of amputation and the options for lower limb prosthesis use.	*	*

To be able to undertake the appropriate surgical management to deliver limb salvage and wound healing.	*	*
To understand and utilise the appropriate angioplasty and stenting skills within the lower limbs with the extent and range delivered collaboratively with interventional radiology and inclusive of reciprocal training between specialties.	*	*
To be able to work in collaboration with interventional radiology to undertake combined open with endovascular reconstruction, with the extent and range delivered collaboratively with interventional radiology and inclusive of reciprocal training between specialties.	*	*
To be able to undertake operative exposure of the infrarenal aorta, iliac, femoral, popliteal, tibial and pedal vessels.	*	*
To be able to undertake Intra-operative assessment with doppler and angiography. To be able to utilise this for the quality control of operations.	*	*
To be able to undertake open operative treatment of Aorto-iliac disease by Aorto-iliac, Aorto-femoral and Axillo-femoral bypasses.	*	*
To be able to undertake open operative treatment of iliofemoral level disease with Femoral and Profunda endarterectomy with patch-plasty, along with Ilio-femoral / Femoral-femoral crossover bypass grafting.	*	*
To be able to undertake Combined open vascular and endovascular reconstruction from common femoral access.	*	*
To be able to undertake infra-inguinal bypasses with the ability to prepare and utilise vein in-situ / reversed/ use arm vein/ SSV and be able to form vein cuffs or patches when combining with prosthetic grafts.	*	*
To be able to undertake operative bypass of occlusive and aneurysmal disease by above and below-knee femoral to popliteal bypass grafting.	*	*
To be able to undertake distal bypass graft from both femoral and popliteal origins to crural (AT, PT and Peroneal) and pedal targets.	*	*
To be able to utilise rotational muscle flaps (Sartorius/ Gracilis/ Rectus Femoris) to cover groin vessels in complex surgery.	*	*
To be able to undertake wound debridement of lower limb wounds including the surgical debridement of the foot and the use of Digital / Ray amputations.	*	*
To be able to undertake all levels of lower limb amputation surgery inclusive of: Transmetatarsal/transtibial (Burgess, skew)/through knee/above knee amputation (+/- myodesis).	*	*
To be able, in collaboration with Orthopaedics or with dual Vascular Consultant operating, undertake a hindquarter amputation.	*	*

VASCULAR COMPLICATIONS OF DIABETES		
OBJECTIVES		
To be able to undertake the assessment and management of patients with complications of diabetes affecting the leg/foot including neuropathy, ulceration, osteomyelitis and Charcot.	*	*
To understand the prevention of complications, the role of orthotic devices and the principles of offloading.	*	*
To be able to interpret the microbiology data and select the most appropriate antibiotics. To be able to initiate urgent control of blood sugar and set up a sliding scale.	*	*
To be able to recognise and act upon the requirement for emergency treatment of infection. To know when revascularisation should be considered and initiated.	*	*
To be able to work collaboratively with allied healthcare colleagues, including endocrinologists/diabetes nurse specialists, podiatrists etc, as part of a Diabetic Foot MDT. Subsequently be able to explain the importance of foot care and surveillance principles to patients with diabetes.	*	*
To be able to undertake a full assessment of the foot of a patient with diabetes inclusive of ABPI, tissue oxygen and monofilament testing.	*	*
To be able to surgically debride the foot and undertake both in and out-patient wound management.	*	*
To be able to manage Diabetic Foot Infection / Necrosis by debridement in both theatre and in the out-patients.	*	*
To be able to undertake operative management of Fulminant Diabetic Foot sepsis.	*	*
VASCULAR DISEASE OF THE UPPER LIMB		
OBJECTIVES		
To be able to recognise and manage; (1) upper limb ischaemia, (ii) chronic upper limb ischaemia and (iii) thoracic outlet syndrome.	*	*
To have a full understanding of upper limb vasculature and neurology and how this relates to the thoracic outlet. Therefore, be able to take a relevant history and examine the upper limb vessels and nerves including provocation.	*	*
To understand the pathology of upper vascular conditions (Thromboembolism, Atherosclerosis, Thoracic Outlet Syndrome, Subclavian Steal syndrome, Vasospastic Disease and Trauma). To be able to select the appropriate investigation and intervention.	*	*
To understand the full range of management options - Conservative (Physiotherapy), Pharmacological (anticoagulant/ prostacyclin), Endovascular (angioplasty/ stent) and Surgical (rib resection, embolectomy and bypass).	*	*
To understand and have observed the role of endovascular intervention (both stenting and angioplasty) in the subclavian artery.	*	*

To be able to undertake operative exposure of the subclavian, vertebral, axillary, brachial and radial arteries.	*	*
To be able to understand and be at the level to undertake dual consultant operating for Subclavian to carotid, Subclavian to brachial bypasses, Subclavian transposition and Subclavian Aneurysm repair.	*	*
To be able to undertake a Brachial access embolectomy, inclusive of over the wire and utilise on table angiography as quality control and plan / undertake surgically directed thrombolysis.	*	*
To be able to understand and develop a practice of thoracic outlet decompression, inclusive of cervical rib excision. Be aware of the differing supraclavicular, infraclavicular and trans-axillary approaches.	*	*
HYPERHIDROSIS		
OBJECTIVES		
To be able to undertake assessment and management of patients with hyperhidrosis (palmar and axillary), with a full understanding of the treatment options (antiperspirants, iontophoresis, thoracoscopic sympathectomy, Botox, curettage).	*	*
To understand the anatomy and physiology of the sympathetic nervous system and the pathophysiology of hyperhidrosis.	*	*
To be able to undertake Axillary Botox therapy or surgical curettage where indicated.	*	*
To understand the technique of thoracoscopic sympathectomy and be able to undertake if it is delivered within the learning environment.	*	*
VASOSPASTIC DISORDERS AND VASCULITIS		
OBJECTIVES		
To be able to undertake the assessment and management of patients with vasospastic disorders (primary and secondary) and vasculitis.	*	*
To understand the pathophysiology of primary and secondary vasospastic disorders (e.g. Raynaud's disease, thoracic outlet compression, Vibration White Finger).	*	*
To understand the pathophysiology of connective tissue disease (systemic sclerosis, SLE, rheumatoid arthritis), and also of Vasculitis (Buerger's disease, Takayasu's, giant cell arteritis, PAN, HIV, TB). To know the treatment options (cold avoidance, smoking cessation, vasodilators (e.g. calcium channel blockers), digital sympathectomy, chemotherapy, retroviral therapy.	*	*
To understand the investigations (cold provocation, blood tests, nail-fold capillaroscopy).	*	*
To be able to undertake a skin or vessel biopsy.	*	*
To understand and ideally have observed or assisted a digital sympathectomy.	*	*

CAROTID ARTERY DISEASE		
OBJECTIVES		
To be able to undertake the assessment and management of patients with cerebrovascular disease. Surgical management of patients with carotid artery territory symptoms (understand the selection for Carotid Endarterectomy and stenting).	*	*
To understand all components of Stroke; anatomy and physiology, the classification, the Stroke Severity Score, the aetiology and epidemiology, the definition of TIA and the differential diagnosis.	*	*
To know the guidelines for management of hypertension and hyperlipidaemia (BHS, NICE, RCP, SIGN).	*	*
To know the indications and use of investigations (CT/A, MRI/A, carotid duplex, echocardiogram).	*	*
To understand the indications for either medical or interventional treatment, the role of endovascular embolectomy and thrombolysis.	*	*
To understand the stoke risk reduction options (antiplatelets, anticoagulants).	*	*
To understand the presentation and treatment options for Carotid Body tumours, Carotid dissection and trauma.	*	*
To be able to plan the medical management of a stroke patient (antiplatelet agents, hypertension and hyperlipidaemia), be able to assess post-operative complications of Carotid endarterectomy and be able to communicate to patients and their relatives the risks and benefits of intervention.	*	*
To understand the technique and indications for carotid stenting and understand the usage of the component parts (guidewire, catheter and protection device placements).	*	*
To understand the technique of superficial and deep cervical blocks and be able to undertake where appropriate.	*	*
To be able to undertake Standard and eversion Carotid endarterectomy by both standard and retro-jugular approaches. To be able to use Carotid shunts and implement distal intimal tacking sutures.	*	*
To be able to perform primary and patch closures and then use and interpret appropriate intra-operative quality control: (angioscopy, duplex ultrasound or completion arteriography).	*	*
To understand the techniques of re-do carotid surgery and be able to undertake with an experienced Vascular Consultant colleague.	*	*
To be able to undertake a direct Carotid cut done and gain control to perform a repair after trauma or percutaneous carotid access.	*	*
ANEURYSM - ELECTIVE		
OBJECTIVES		
To be able to undertake the assessment and management of elective aneurysms. Including the full range of investigations US, CTA, MRA and PET and the subsequent treatment options (Medical, open, EVAR, FEVAR, Hybrid).	*	*
To understand the pathology of aortic aneurysms (atherosclerotic inflammatory, mycotic, collagen disorders, post-dissection, vasculitic).	*	*

To understand the anatomy and pathology of; aortic dissection, thoracoabdominal aneurysms and less common aneurysms (popliteal, visceral, carotid, subclavian and false aneurysms).	*	*
On taking a full history and examination be able to assess the comorbidity / operative fitness.	*	*
To be able to undertake endovascular planning including collaboration for complex cases and also recognise/ manage postop. complications: bleeding, thrombosis, embolism, organ failure, endoleak, infection.	*	*
To understand the endovascular techniques to treat endoleaks and undertake collaborative working with interventional radiology to correct these.	*	*
To understand the techniques and indication to stent visceral aneurysms.	*	*
To understand and undertake endovascular stenting of peripheral aneurysms with the extent and range dependent on the local service delivery needs.	*	*
To be able to undertake completely the open repair of an infrarenal AAA.	*	*
To be able to undertake an Endovascular repair of an infra renal AAA as part of a collaborative team. Where required with the collaborative team delivery be able to undertake an Aorto-uni-iliac stent-graft, iliac occluder & crossover graft.	*	*
To be able to undertake, under supervision, Internal iliac artery/aneurysm coiling as part of EVAR repair with collaborative team delivery.	*	*
To be able to undertake, ideally with dual Consultant operating, complex AAA, including repair of: Inflammatory AAA, Internal iliac aneurysm, Juxta-renal and Supra-renal AAA.	*	*
To aim for the level of being guided through Juxta-renal or suprarenal AAA – fenestrated /branched stents, within a collaborative team delivery.	*	*
To understand the technical skills of open and hybrid Thoraco-abdominal aneurysm repairs and where able to undertake, aim for the level of being guided though the case.	*	*
To aim for the level of being guided through Thoracic aneurysm/dissection stent grafts within a collaborative team delivery.	*	*
To able to undertake the management of Femoral artery closure devices, inclusive of being able to deal with the complication and convert to open repair.	*	*
To be able to obtain open surgical control and repair a femoral false aneurysm.	*	*
To be able to undertake operative repair of Femoral and Popliteal aneurysms.	*	*

To be able to undertake, ideally with dual Consultant operating, the repair of less common aneurysms, inclusive of: Carotid aneurysm repair, Subclavian aneurysm repair, Visceral aneurysm repair and as part of a consultant team undertake a re-operation of an infected infrarenal AAA graft.	*	*
ANEURYSM - EMERGENCY		
OBJECTIVES		
To be able to undertake the assessment and subsequent management of emergency aneurysms inclusive of appropriate and timely investigation and both the open and endovascular treatment options.	*	*
To be aware of the surgical methods of immediate aortic control - supra-coeliac and infrarenal and the post procedure complications such as abdominal compartment syndrome.	*	*
To be able to undertake timely team-working with theatres and interventional radiology and provide collaborative endovascular management of emergency aneurysms.	*	*
To be able to undertake the Open repair of a ruptured infrarenal AAA (inclusive of dual consultant operating). Where required be able to place a Suprarenal/supra coeliac clamp or obtain Balloon control of the aorta .	*	*
To be able to recognise limb ischaemia and be able to undertake a Femoral thrombectomy and / or additional lower limb revascularisation.	*	*
To be able to undertake an Endovascular repair of a ruptured infra renal AAA as part of a collaborative team. Where required with the collaborative team delivery be able to undertake an Aorto-uni-iliac stent-graft, iliac occluder & crossover graft.	*	*
To aim for the level of being guided through Endovascular stenting of acute aortic dissection or acute aortic transection within a collaborative team delivery.	*	*
VASCULAR ACCESS (VA)		
OBJECTIVES		
To be able to describe need for VA, common methods of VA, establish VA and manage complications of VA. Inclusive of an understanding of the physiology of A-V fistula along with the advantages and disadvantages of the various methods of renal support.	*	*
To have a full understanding of the upper and lower limb arteries and veins. To know the pre-operative assessment and choice of VA and arrange the appropriate investigations. Ideally to be able to undertake the duplex assessment of the pre-dialysis patient.	*	*
To understand the techniques to maintain and revise Vascular Access inclusive of ultrasound and percutaneous fistulography. To understand the roles of endovascular intervention and utilise perioperatively where appropriate. To be able to utilise ultrasound guided access to the femoral artery and jugular vein.	*	*
To be able to undertake surgical AV fistula at radio-cephalic and Brachiocephalic levels.	*	*

To be able to undertake Basilic vein transposition AV fistula.	*	*
To understand how to technically undertake complex AV fistula and be able to undertake these as part of a regional renal-access service, including creation of; a forearm loop graft, a thigh loop graft and a Saphenous vein transposition AV fistula.	*	*
To be able to undertake graft salvage and revision surgery including: Graft thrombectomy, revision, ligation or excision.	*	*
To have had operative exposure to DRIL and more complex Fistula salvage and revision procedures.	*	*
To be able to insert dialysis access inclusive of central venous dialysis catheters and peritoneal dialysis catheters.	*	*
RENOVASCULAR DISEASE AND TRANSPLANTATION		
OBJECTIVES		
To have knowledge of and be able to manage vascular problems related to renal disease and vascular surgical problems in patients with renal disease and renal transplantation.	*	*
To understand renal & reno-vascular anatomy, the role of kidney in control of blood pressure and calcium haemostasis.	*	*
To understand the pathophysiology of acute kidney injury and chronic kidney disease.	*	*
To understand the aetiology of renal disease; pre-renal (shock, trauma, sepsis and atherosclerosis), renal; intrinsic disease and toxins, and post renal (obstruction, stone or tumour).	*	*
To understand the pre-operative assessment and the indications for all the investigation options inclusive of indications for biopsy.	*	*
To understand the role of renal artery angioplasty and embolisation in managing renovascular disease. To be aware of the technical requirements for radiological access of the renal arteries.	*	*
To be able to undertake the open surgical approaches to the kidney and/ or expose the renal vessels.	*	*
To understand and ideally have been supervised through the laparoscopic approach to the kidney.	*	*
To be able, with colleague assistance / dual Consultant operating, to undertake Renal artery Endarterectomy / bypass and where required Open Surgical nephrectomy (inclusive of trauma).	*	*
If undertaking a transplant placement, within Vascular training, plan to be able, under supervision, to undertake: Living kidney donor nephrectomy open/ laparoscopic, Renal auto transplant, Renal allotransplant, and a Transplant Nephrectomy.	*	*

MESENTERIC VASCULAR DISEASE		
OBJECTIVES		
To be able to undertake the assessment and management of patients with acute and chronic mesenteric ischaemia.	*	*
To understand the anatomy of the mesenteric arterial and venous system and the physiology of this.	*	*
To understand the roles, indications, and restrictions of endovascular interventions in mesenteric vascular disease (lysis, angioplasty, stenting).	*	*
To understand the pathophysiology of mesenteric ischaemia and how that presents in acute and chronic cases. To know how to investigate with mesenteric angiography/ CTA and the treatment options (medical, surgical or endovascular).	*	*
To be able to manage the complications of mesenteric ischaemia and of any surgical intervention.	*	*
To be able to undertake mesenteric thrombo-embolectomy and mesenteric bypass, likely with dual consultant operating.	*	*
SUPERFICIAL VENOUS DISEASE		
OBJECTIVES		
To be able to undertake the assessment and management of varicose veins, including recurrent veins and complications.	*	*
To understand the anatomy of the superficial venous system, the physiology of venous dynamics and the pathology of superficial venous incompetence.	*	*
To understand the process of neovascularisation and recanalisation, the presentation and effect of pelvis venous reflux and the complications of venous hypertension.	*	*
To understand the presentation and management of oedema, lipodermatosclerosis, ulceration, bleeding and recurrence. To know how to examine varicosities and venous incompetence.	*	*
To be able to interpret the investigation findings of venous duplex, venography (including CTV and MRV) and where necessary plethysmography.	*	*
To understand and be able to undertake all the management options (conservative, sclerotherapy, endovenous ablation and surgery).	*	*
To be able to dress an ulcer and undertake compression bandaging therapy.	*	*
To be able to undertake open surgical management of lower limb superficial venous disease (multiple phlebectomies, sapheno-femoral junction ligation, sapheno-popliteal junction ligation, long saphenous vein strip).	*	*
To be able to cannulate the long and short saphenous veins under ultrasound control and treat by endovenous thermal ablation.	*	*
To be able to undertake both ultrasound guided foam sclerotherapy of truncal veins and injection sclerotherapy.	*	*
To be able to undertake recurrent varicose vein surgery.	*	*

DEEP VENOUS THROMBOSIS		
OBJECTIVES		
To be able to undertake the assessment and management of patient with deep venous thrombosis, inclusive of the knowledge of the deep venous anatomy and the pathophysiology of thrombosis. Recognise the early/ late complications of DVT.	*	*
To understand the indications for intervention (caval filters, thrombolysis, surgical thrombectomy / Venous Stents).	*	*
To understand the role of thrombophilia within DVT and the options of thromboprophylaxis.	*	*
To understand the options for investigation with Ultrasound, Duplex, MRV, CTPA and V/Q scans.	*	*
To be able to utilise the management pathway of endovenous therapy (thrombolysis) and the subsequent or associated insertion of a venous stent.	*	*
To be aware of the technical components of insertion and withdrawal of a caval filter.	*	*
To be able to undertake a venous thrombectomy and recognise any complications.	*	*
DEEP VENOUS INSUFFICIENCY		
OBJECTIVES		
The assessment and management of patient with deep venous insufficiency.	*	*
To understand the pathology of deep venous insufficiency (DVT, valvular dysfunction, valvular agenesis), to know the history of presentation and the risk factors.	*	*
To understand the examination findings of DVI, how to diagnose the complications and then how to investigate (duplex, venography, plethysmography, cross-sectional imaging, IVUS).	*	*
To understand the management options (compression systems, valvuloplasty, valve transplant, bypass, amputation).	*	*
To understand the indications and methods of deep venous stenting, working collaboratively with interventional radiology.	*	*
To be able to undertake leg ulcer biopsies.	*	*
To be able to undertake perforator ligation procedures.	*	*
To be able to undertake deep venous reconstruction or venous bypass procedures with appropriate vascular consultant mentoring.	*	*
LYMPHOEDEMA		
OBJECTIVES		
To be able to assess and manage patients with lymphoedema, with an awareness of the classification of lymphoedema (primary and secondary, Lipoedema).	*	*
To understand the anatomy, physiology, and pathophysiology of the lymphatic system. To be able to describe and recognise the clinical features of lymphoedema and the chronic effects.	*	*

To understand the investigation (lymphoscintigraphy, lymphangiogram, CT/ MRI) and management options (manual compression, compression bandaging, compression hosiery, surgical options).	*	*
To be able to undertake the surgical treatment of lymphoceles and lymphatic leaks.	*	*
VASCULAR SURGERY ABDOMINAL AND GENERAL SURGERY TOPICS		
	Phase 2	Phase 3
SUPERFICIAL SEPSIS INCLUDING NECROTISING INFECTIONS		
OBJECTIVES		
To be able to undertake the diagnosis and basic management of gas gangrene and other necrotising infections.	*	*
To understand the aetiology, bacteriology and treatment options of superficial abscesses, cellulitis, gas gangrene, and necrotising infections.	*	*
To understand the mechanisms of septic shock and the appropriate antibiotic regimens.	*	*
To be able to manage superficial abscesses either through surgical drainage or aspiration under ultrasound control.	*	*
To be able to surgically manage Necrotising Fasciitis through debridement or radical excisional surgery.	*	*
ABDOMINAL WALL		
OBJECTIVES		
To understand the management of abnormalities of the abdominal wall, excluding hernia, through knowledge of the abdominal wall anatomy and the pathology of acute and chronic conditions (haematoma, sarcoma, desmoid tumour).	*	*
To be able to determine where a swelling is within the abdominal wall and where this may be vascular in origin.	*	*
To understand how to investigate these (when to use ultrasound / biopsy) and know what management to advise.	*	*
To be able to conservatively manage abdominal wall haematomas.	*	*
LAPAROSCOPIC SURGERY		
OBJECTIVES		
To understand the principles of laparoscopic surgery including technical aspects and common complications.	*	*
To understand the physiology of pneumoperitoneum and the anaesthetic issues of laparoscopic surgery.	*	*
To understand the technology of video imaging, cameras and insufflator, the instruments used (clips, staplers and port types). To be aware of how equipment failure would be managed and to understand the use of diathermy with its associated risks.	*	*
To be able to recognise and manage laparoscopic complications, in particular those of a vascular nature. To be able to provide informed consent for laparoscopic procedures.	*	*

To be able to insert laparoscopic ports by both the open and closed techniques and be able to deal with all the complications.	*	*
To be able to undertake a diagnostic laparoscopy and ask for General Surgical assistance where required.	*	*
To be able to undertake the laparoscopic skills of suturing and knotting and be able to control bleeding, to the level of requiring General Surgical assistance to deal with some complications.	*	*
ELECTIVE HERNIA		
OBJECTIVES		
To be able to undertake the diagnosis and management, including operative management, of primary and most recurrent abdominal wall hernia.	*	*
To understand the anatomy of inguinal region including inguinal canal, femoral canal, abdominal wall and related structures e.g. adjacent retroperitoneum and soft tissues. To understand the relationship of structure to the function of the anatomical structures and as such understand the natural history of abdominal wall hernias including presentation, course, possible complications and where this may relate to a vascular presentation.	*	*
To understand the current operative repair options and where this may relate to vascular conditions or where they may need to be utilised in a vascular patient. (i.e. use of mesh, both open and laparoscopic and posterior wall plication).	*	*
To be able to diagnose and assess vascular patients presenting with common abdominal wall hernias (such as incisional, inguinal, femoral, epigastric, umbilical and paraumbilical).	*	*
To be able to undertake abdominal wall hernia repairs, (femoral, inguinal and incisional) and be able to recognise complications requiring assistance.	*	*
To be able to undertake laparoscopic hernia repairs (TEPS and TAPS) under General Surgery consultant supervision / direction.	*	*
ACUTE ABDOMEN		
OBJECTIVES		
To be able to undertake the assessment, resuscitation and management of patients with acute abdomen.	*	*
To understand the abdominal anatomy and hence how the pathology presents, such that understand the causes of the acute abdomen.	*	*
To understand the pathophysiology of peritonitis, sepsis and shock, how to resuscitate the patient, and to understand the optimal investigations to arrange and the indications for surgery.	*	*
To be able to identify the non-vascular cause of acute abdominal pain.	*	*
To be able to operate on the acute abdomen and undertake a diagnostic laparotomy and abdominal lavage. To be able to undertake both open and laparoscopic appendicectomies.	*	*

ACUTE INTESTINAL OBSTRUCTION		
OBJECTIVES		
To be able to recognise and manage most cases of postoperative intestinal obstruction in conjunction with abdominal surgeons.	*	*
To understand the aetiology of intestinal obstruction, the differential diagnosis and the treatment options.	*	*
To understand how to investigate intestinal obstruction and provide nutritional support.	*	*
To be able undertake a laparotomy and division of adhesions in isolation or as the access to a vascular procedure.	*	*
To be able undertake both small and large bowel resections (with stoma formation) in collaboration with General Surgery.	*	*
GASTROINTESTINAL BLEEDING		
OBJECTIVES		
To be able to undertake assessment of all cases of gastrointestinal bleeding, management and referral to subspecialists as needed. Inclusive of a knowledge of coagulopathy. To have the knowledge to resuscitate the hypotensive patient.	*	*
To be able to recognise all causes of GI bleeding, understand the role of endoscopy and CT angiography.	*	*
To understand the indications for operation and /or endoscopic or endovascular therapeutic procedures. To be able to recognise re bleeding and post-operative problems, to know how these are managed along with the postoperative care and fluid balance.	*	*
To be able to undertake a laparotomy for bleeding and develop the ability to mobilise the colon to expose the iliac vessels.	*	*
To be able to undertake a Sigmoid colectomy in conjunction with the colorectal surgeons.	*	*
ABDOMINAL INJURIES		
OBJECTIVES		
To be able to identify and manage the majority of abdominal injuries, inclusive of the interpretation of imaging from a vascular perspective.	*	*
To understand the principles of management of severely injured patients, the differences of this in children and the importance of the mechanism of injury.	*	*
To understand coagulopathy and the indications for un-cross matched blood.	*	*
To understand the principles of damage control surgery, the management of hollow organ injury and recognise where injuries require input from other specialities.	*	*
To understand the appropriate use of imaging for abdominal injuries (CTA and FAST scanning).	*	*
To be able to undertake a trauma laparotomy, mobilise the colon to expose the major vessels, control the bleeding and manage liver trauma by packing. To be able to undertake a Splenectomy in collaboration with Trauma surgeons.	*	*

At trauma laparotomy to be able to recognise the requirement for Liver debridement or distal pancreatectomy and undertake these in collaboration with Trauma surgeons. In collaboration with General Surgery to be able to undertake a sigmoid colectomy.	*	*
GASTRIC STASIS, PARALYTIC ILEUS AND CONSTIPATION		
OBJECTIVES		
To be able to undertake the management of postoperative gastric stasis, pseudo-obstruction and constipation. To be able to take the appropriate history, undertake the physical examination and initiate appropriate investigations / management.	*	*
To understand normal gastric, small bowel and colonic physiology (including gut hormones and peptides) and the process of defaecation.	*	*
To know the classification of types and causes of postoperative gastric stasis, pseudo-obstruction and constipation, along with the use of prokinetic and anti-emetic agents.	*	*
To know the different types of laxatives and describe the indications, contraindications, modes of action, and complications of each: stimulant, osmotic, bulk-forming, lubricant.	*	*
ISCHAEMIC AND INFECTIOUS COLITIS		
OBJECTIVES		
To be able to undertake the management of ischaemic colitis and clostridium difficile colitis.	*	*
To understand the vascular anatomy of the colon and the epidemiology, aetiology, pathogenesis, investigation, medical management and indications for surgery of both ischaemic colitis and clostridium difficile colitis.	*	*
To be able to manage ischaemic colitis and recognise and manage after abdominal aortic aneurysms repair.	*	*
To be able to manage infective colitis, including clostridium difficile.	*	*
RETICULO-ENDOTHELIAL SYSTEM		
OBJECTIVES		
To be able to undertake the management of conditions affecting the reticulo-endothelial and haemopoietic systems.	*	*
To understand the causes of lymphadenopathy.	*	*
To understand the indications for elective splenectomy-haemolytic anaemia, ITP, thrombocytopaenia, myeloproliferative disorders.	*	*
To know the indications for emergency splenectomy, the role of splenic preservation, the role of splenic embolisation and the post procedure sequelae of these.	*	*
To be able to plan appropriate diagnostic tests for lymphatic conditions and to work in consultation with haematology to plan the appropriate treatment schedule in splenic conditions.	*	*
To be able to undertake a lymph node FNA and biopsy a node within the groin or axilla.	*	*
To be able to undertake a lymph node block dissection in collaboration or be mentored by a colleague.	*	*