Vascular Surgery curriculum

July 2014 mapped to March 2016

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VASCULAR PHYSIOLOGY

OBJECTIVE

Knowledge of the physiology of the circulation

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Detailed knowledge of the control of blood pressure and factors affecting it	4	4	4	
Detailed knowledge of blood flow, haemostasis and the effects of haemorrhage	4	4	4	
Detailed knowledge of the effects of ischaemia and reperfusion	4	4	4	
Detailed knowledge of microcirculatory and lymphatic physiology	4	4	4	
CLINICAL SKILLS				
Able to safely manage a patient in the early post-operative phase after major vascular interventions e.g. cardiac, respiratory and renal monitoring and support	3	4	4	Strongly recommended
Able to correct clotting abnormalities in patients undergoing vascular interventions	3	4	4	
Able to undertake prophylactic and therapeutic anticoagulation	4	4	4	
Can explain vascular physiology to patients and colleagues	3	4	4	

TECHNICAL SKILLS

N/A

VASCULAR PATHOLOGY

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Knowledge of the diseases (congenital and acquired) of the circulation				
KNOWLEDGE				
Is aware of the congenital and pathological conditions that affect the circulation	4	4	4	
A detailed knowledge of atherosclerosis and its associated risk factors, venous disease, lymphatic disease, thrombo-embolic disease, vasospastic and vasculitic disease	3	4	4	
A detailed understanding of the mechanisms of vascular trauma	3	4	4	
Causes of peripheral neuropathy	3	4	4	
Alternative causes for limb pain (neurological and musculoskeletal)	3	4	4	
CLINICAL SKILLS				
Able to take detailed history from patient with arterial or venous disease	4	4	4	
Examination of ischaemia and aneurysmal disease	4	4	4	
Examination of varicose veins and swollen leg	4	4	4	
Can detect pathological arterial and venous abnormalities	4	4	4	
Able to prioritise - recognises patients who need to be seen or treated urgently	4	4	4	
Selects appropriate investigations tailored to the individual patient	3	4	4	Desirable
Can explain vascular disease to patients and colleagues	3	4	4	Desirable
TECHNICAL SKILLS				
Hand-held Doppler assessment of varicose veins	4	4	4	Desirable
Ankle Brachial Pressure Indices and waveform interpretation	4	4	4	Desirable
Duplex ultrasound assessment of varicose veins	2	3	3	Desirable

VASCULAR EPIDEMIOLOGY

OBJECTIVE
Knowledge of the epidemiology of vascular disease

KNOWLEDGE

CLINICAL SKILLS

TECHNICAL SKILLS

N/A

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
Principles of epidemiology, including basic study design and relevant terms.	4	4	4	
Epidemiology of peripheral arterial disease.	4	4	4	
Epidemiology of venous disorders including varicose veins and venous thromboembolism.	4	4	4	
Epidemiology and interactions of major vascular risk factors including smoking demographics	4	4	4	
Explanation of risk factors to a patient with vascular disease	3	4	3	Strongly recommended

SCREENING AND SURVEILLANCE

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE				
Knowledge of the principles of screening				
KNOWLEDGE				
Key elements of design and delivery of screening tests in general	4	4	4	
AAA screening and surveillance programme	3	4	4	
Governance and quality control of AAA screening	3	4	4	
EVAR/TEVAR and vein graft surveillance	3	4	4	Desirable
CLINICAL SKILLS				
Counselling a patient undergoing screening or who has a positive screening test	3	4	4	Strongly recommended
TECHNICAL SKILLS				
Measure AAA diameter in US scan	2	3	4	Desirable

RISK FACTOR MODIFICATION

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE				
Knowledge of vascular risk factors and risk-factor modification				
KNOWLEDGE				
Blood pressure control	3	4	4	
Lipid lowering therapy	3	4	4	
Management of diabetes	3	3	3	
Smoking cessation	3	4	4	
Antiplatelet and anticoagulant therapy	3	4	4	
Exercise and exercise therapy	3	4	4	
Dietary factors and weight control	3	4	4	
Guidelines for hypertension and hyperlipidaemia management (BHS, NICE, RCP, SIGN)	2	3	4	
CLINICAL SKILLS				
Explanation of risk factor modification to a patient	3	4	4	Strongly recommended
Ability to assess and prescribe blood pressure and other risk factor medication	3	3	3	
Understanding of main drug interactions and side effects of key risk reduction drugs (e.g. statins, antiplatelet agents & anti-hypertensives)	4	4	4	
Smoking cessation counselling	3	4	4	
Dietary and exercise advice to PAD patients	3	4	4	
Interpretation of a lipid screen and other relevant biochemical screens	3	4	4	
TECHNICAL SKILLS				
Set up an insulin sliding scale	4	4	4	

VASCULAR CONDITIONS OF CHILDHOOD

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE				

Assessment and management of children with developmental and traumatic conditions of their circulatory system

KNOWLEDGE

					Strongly recommended: Critical Care Child protection Desirable Team-working
Principles of surgery in children		2	3	3	
Vascular conditions of childhood (including trauma and vascular anomalies)	Haemangiomas, venous malformations, AV malformations and lymphatic malformations	2	3	3	
Treatment options	Medical	1	3	3	
	Endovascular	1	2	3	
	Surgical	2	3	3	

CLINICAL SKILLS

History and examination of children		2	3	3	
Communication with parents and /or carers		2	3	3	Desirable
Examination of vascular anomalies		1	2	3	
Investigation of vascular anomalies	Hand-held Doppler	1	3	4	Desirable
	Duplex ultrasound	1	2	3	Strongly Recommended IP
	Arteriography	1	2	2	
Management strategy	Medical (including compression)	1	3	4	
	Endovascular	1	2	3	
	Surgical	2	3	3	

TECHNICAL SKILLS

	Arterial repair (e.g. following supracondylar fracture	1	2	3	
	Vascular access	1	2	2	

NUTRITION

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Recognise the need for artificial nutritional support, assess whether this is appropriate and arrange treatment				
KNOWLEDGE				
Effects of malnutrition, both excess and depletion	3	3	4	
Methods of screening and assessment	2	3	4	
CLINICAL SKILLS				
Arrange access to suitable artificial nutritional support, preferably via a nutrition team	2	3	4	
Dietary supplements	2	3	4	
Enteral nutrition	2	3	4	
Parenteral nutrition	2	3	4	
TECHNICAL SKILLS				
Placement of nasojejunal feeding tube at operation	2	3	4	
Insertion of feeding jejunostomy at operation	2	3	4	
Insertion of un-tunnelled central venous catheter	1	3	4	Desirable
Insertion of tunnelled central venous catheter (Hickman or port)	1	2	3	

CARDIO-RESPIRATORY DISEASE

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVES Assessment and management of patients with co-existent cardiac and/or respiratory disease				
KNOWLEDGE				
Anatomy of the heart and lungs	3	4	4	
Cardio-respiratory physiology	3	4	4	
Cardio-respiratory pathology (IHD, MI, heart failure, COPD, ARDS)	3	4	4	
Prognosis and impact upon patients undergoing major vascular surgery	3	4	4	
Therapeutic options including pharmacology and drug interactions	3	3	3	
Current guidelines on resuscitation	4	4	4	
Define indications for and haemo-dynamic consequences of positive pressure ventilation	3	3	3	
CLINICAL SKILLS				
Examination of the heart and lungs	4	4	4	
Select patients who require pre-operative investigations (ECG, echo, MUGA, 24hr tape, CXR, CT, respiratory function, CPX testing)	3	4	4	
Interpretation of results	2	3	4	
Identify patients unsuitable for vascular intervention	2	3	4	
TECHNICAL SKILLS				
Arterial blood gas sampling and interpretation of the results	4	4	4	Desirable
Basic management of acute MI/heart failure	3	4	4	
Cardiopulmonary resuscitation (ALS)	4	4	4	Strongly recommended: Life support Critical care ALS/ATLS
Insertion of chest drain and management	4	4	4	
Mini-tracheostomy	4	4	4	

HAEMATOLOGY

OBJECTIVES

Competent in relevant aspects of blood transfusion, bleeding disorders and drugs that affect clotting

KNOWLEDGE

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
Coagulation and fibrinolysis pathways	4	4	4	
Epidemiology, natural history, and molecular basis of haemophilia and thrombophilia	3	4	4	
Pharmacology of unfractionated heparin, LMWH, warfarin and antiplatelet agents	4	4	4	
Principles of donor selection and preparation of blood components including donor selection, preparation of blood products and viral safety	3	3	3	
Coagulation factors and their side effects	4	4	4	
Principles of clinical blood transfusion including hazards of blood transfusion, SHOT report and the role of the hospital transfusion committee	4	4	4	
Methods of blood conservation including pre-donation and intra-operative cell salvage	4	4	4	
Mechanism of DIC, effect of massive, transfusion, renal and hepatic disease	3	4	4	

CLINICAL SKILLS

Interpretation of laboratory results	4	4	4	
Methods and complications of reversing anti-coagulation in patients with and without haemorrhage	3	4	4	
Management of haemophilia and thrombophilia in terms of treatment and prophylaxis before vascular surgery	3	3	3	
Initiation and monitoring of anticoagulation	4	4	4	
Initiation of antiplatelet therapy in various situations	3	4	4	
Appropriate use of blood and blood products	4	4	4	
Management of complications from blood transfusion	3	3	3	

TECHNICAL SKILLS

Intra-operative use of heparin, monitoring techniques (TEG) and reversal using protamine	3	4	4	

CLINICAL AUDIT, RESEARCH & HEALTH ECONOMICS

OBJECTIVE

An understanding of the relevance of clinical audit, research and health economics to the practice of vascular surgery

KNOWLEDGE

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
National Vascular Database	3	4	4	
Principles of audit and quality control	3	4	4	
Principles of clinical research and systematic review	2	3	4	
Evidence-based vascular practice	2	3	4	
Knowledge of key health economic terms	2	3	4	
Important generic QoL tools for venous and arterial disease	2	3	4	
Relevance of QALYS and calculation of incremental cost effectiveness ratios	2	3	4	
Types of health economic analyses	2	3	4	
Planning and budgeting vascular services	2	3	4	

CLINICAL SKILLS

Participation in local and national audit of outcomes	3	4	4	
Conducting a morbidity and mortality meeting	3	4	4	
Conducting a journal club	3	4	4	
Participation in clinical research	3	4	4	
Presentations at vascular meetings (e.g. VSGBI and ESVS)	3	4	4	
Publications in vascular journals (e.g. EJVES and JVS)	3	4	4	
Can explain the principles of health economics to patients, colleagues and managers	2	3	4	

TECHNICAL SKILLS

N/A

OUTPATIENT, WARD and MDT MEETINGS

OBJECTIVE
Assess individual vascular outpatients and inpatients
Manage an outpatient clinic, ward round and MDT meeting

KNOWLEDGE

		ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
Individual patient assessment	Relevant vascular anatomy, physiology and clinical knowledge	3	4	4	
Outpatient and inpatient service	Understanding of hospital organisation	2	3	4	
	Understanding of multi-disciplinary team and meetings	3	4	4	
	Relevant guidelines for vascular disease management	2	3	4	

CLINICAL SKILLS

Individual patient assessment:	Focused history taking and examination	3	4	4	Desirable
	Organise appropriate investigations	3	4	4	
Management of an outpatient clinic, ward round and MDT meeting	Presentation of patients on ward round and at MDT	2	3	4	
	Ability to allocate management of patients to appropriate team members	2	3	4	
	Appropriate referral to other specialists when indicated	2	3	4	
	Liaison with critical care and other support services (e.g. pain team, physiotherapy, rehab)	2	3	4	
	Ability to prioritise urgent patient appointments, investigations and interventions	2	3	4	
	Prompt and clear clinic letters and discharge summaries	3	4	4	

TECHNICAL SKILLS
N/A

PRINCIPLES OF VASCULAR IMAGING

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Radiation safety, principles and indications for vascular imaging				
KNOWLEDGE Principles of ultrasound, CT and MR imaging and catheter angiography	3	4	4	Required Component of Specialty Induction)
Dangers of ionizing radiation and safe practice	3	4	4	
Monitoring of ionizing radiation and how exposure can be reduced	3	4	4	
Regulations and requirements in use of ionizing radiation	3	4	4	
Indications and factors determining appropriate investigation for a patient with vascular disease	3	4	4	
Vascular contrast agents and associated hazards	3	4	4	
CLINICAL SKILLS				
Explanation of various imaging modalities to a patient	3	4	4	Strongly recommended
Selection of appropriate investigation	3	4	4	
Evaluate patient for procedure	3	4	4	
Identify factors that increase risk for patient	3	4	4	

VASCULAR ULTRASOUND

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE To understand and be able to perform basic vascular ultrasound				
KNOWLEDGE				
Understand the principles of Doppler ultrasound	3	4	4	
Understand limitations of US scanning	2	3	4	
Understand ultrasound spatial resolution in relation to scan plane	2	3	4	
Understand the requirements for imaging different vascular territories	2	3	4	
Ultrasound image interpretation	2	3	4	Required Component of Specialty Induction
CLINICAL SKILLS				
Explanation of ultrasound to a patient	3	4	4	Strongly recommended
TECHNICAL SKILLS				
Able to choose the appropriate ultrasound probe	2	3	4	Required Component of Specialty Induction
Able to optimize grey scale imaging	2	3	4	Required Component of Specialty Induction
Able to optimize colour flow imaging	2	3	4	Required Component of Specialty Induction
Able to optimize pulsed wave settings	2	3	4	Required Component of Specialty Induction
Able to perform superficial venous ultrasound studies	2	3	4	Required Component of Specialty Induction
Able to perform arterial ultrasound studies for intra-operative quality control	2	3	4	
Able to screen for AAA and measure the AP diameter	2	3	4	Required Component of Specialty Induction
Percutaneous puncture of saphenous vein under US control	2	3	4	Required Component of Specialty Induction
Percutaneous puncture of femoral artery under US control	2	3	4	Strongly recommended

COMPUTED TOMOGRAPHIC IMAGING

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE To understand, interpret and manipulate CT imaging and CT angiography				
KNOWLEDGE				
Understand how CT images are generated	2	3	3	
Understand concepts of helical and multi-slice scanning	2	3	4	
Understand that scans are performed in the axial plane	3	4	4	
Understand CT spatial resolution	2	3	4	
Recognise X-ray dose and risks associated with study	3	3	4	
Recognise the need to tailor individual scan to clinical problem e.g. AAA elective vs. emergency, mesenteric/renal, carotid, peripheral, venous	2	3	4	
Understand basic principles of image reformatting in various planes	2	3	4	
Understand the principle behind image reconstruction and MIP images	2	2	2	
Understand the use of intravascular and oral contrast agents	2	3	4	
Recognise risks of intravascular contrast and how to avoid them	3	4	4	
Understand common artifacts	2	4	4	
CLINICAL SKILLS				
Explanation of CT and the risks to a patient	3	4	4	Strongly recommended
Able to manage contrast reactions	3	4	4	
Able to recognise normal cross-sectional anatomy	3	3	3	Desirable
Able to recognise vascular pathology on scans	3	4	4	Desirable
TECHNICAL SKILLS				
Able to manipulate images on the console	1	2	3	Desirable
Able to obtain appropriate measurements of blood vessels	1	3	4	Strongly recommended

MAGNETIC RESONANCE IMAGING

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE To understand, interpret and manipulate MR imaging and MR angiography				
KNOWLEDGE				
Understand how MR images generated	2	2	2	
Recognise the risks of MRI	3	4	4	
Understand that scans are performed in any plane	3	4	4	
Understand MR spatial resolution in relation to scan plane	2	2	4	
Recognise the need to tailor individual scan to clinical problem e.g. AAA elective vs. emergency, mesenteric/renal, carotid, peripheral, venous	2	3	4	
Understand the principles of non contrast MR angiographic techniques	2	2	2	
Understand the principles of contrast enhanced MR angiographic techniques	2	3	3	
Understand basic principles of image reformatting in various planes	2	3	3	
Understand the principle behind image reconstruction and MIP images	2	3	3	
Understands the different types of MR angiographic contrast	2	2	3	
Recognise common MR artifacts	2	3	3	
CLINICAL SKILLS				
Explanation of MRA and the risks to a patient	3	4	4	Strongly recommended
Able to recognize normal cross sectional anatomy	2	2	2	Strongly recommended
Able to recognise vascular pathology on scans	2	3	4	Strongly recommended
TECHNICAL SKILLS				
Able to manipulate images on the console	1	2	3	Desirable
Able to obtain appropriate measurements of blood vessels	1	2	3	Desirable

CATHETER ANGIOGRAPHY

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE To understand and perform intra-operative catheter angiography				
KNOWLEDGE				
Commonly used arterial and venous access sites	3	4	4	
Commonly used contrast agents, including CO2	3	4	4	
Road-mapping, parallax, measurement techniques, hand and power injection	2	3	4	
Measures to improve angiographic imaging e.g. breath holding, multi-masking, centering, collimation, frame rate, antegrade etc	2	3	4	
Risks of angiography	3	4	4	
Guidewire and catheter types, characteristics and indications	2	3	4	Required Component of Specialty Induction
Introducer, dilator and sheath types, characteristics and indications	2	3	4	Required Component of Specialty Induction
CLINICAL SKILLS				
Explanation of catheter angiography and the risks to a patient	3	4	4	Required Component of Specialty Induction)
TECHNICAL SKILLS				
Retrograde femoral artery puncture	2	3	4	Required Component of Specialty Induction l
Antegrade femoral artery puncture	2	3	4	Required Component of Specialty Induction
Ultrasound guided arterial and venous puncture	3	3	4	Required Component of Specialty Induction
Obtains secure vascular access with sheath, flushes catheters and sheaths appropriately	3	3	4	Required Component of Specialty Induction
Pressure measurement	2	3	4	
Positions guidewire using fluoroscopy and places non selective catheter in aorta	2	3	4	Required Component of Specialty Induction
Keep radiation dose to minimum by use of appropriate e.g. fluoroscopy, collimation, runs	2	3	4	
Obtain satisfactory intra-operative angiograms	2	3	4	Required Component of Specialty Induction
Recognize inadequate study and need for alternative angiographic views	2	3	4	

ENDOVASCULAR PROCEDURES

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE				
To gain endovascular knowledge and skills				
KNOWLEDGE				
Indications and outcomes for endovascular intervention	2	3	4	
The complementary role of endovascular therapy to medical and surgical therapy	2	3	4	
Balloon and stent types, characteristics and indications	2	3	4	
Stent-graft types, characteristics and indications	2	3	4	
Materials used for embolisation, characteristics and indications	2	3	4	
Closure devices, characteristics and indications	2	3	4	
CLINICAL SKILLS				
Explanation of endovascular intervention and the risks to a patient	2	3	4	Strongly recommended
Undertakes preoperative checks and team briefing	3	4	4	
Demonstrates good patient, personal and team safety	3	4	4	
Ensures good asepsis, especially when prosthetic materials are involved	3	4	4	
Good communication with patient and all members of the angio team	3	4	4	Desirable
Accurate procedural record and post-procedural instructions	3	4	4	
Recognizes complications e.g. dissection, embolisation	2	3	4	
Uses drugs appropriately e.g. vasodilators, anticoagulants, analgesics, sedatives, anti-peristaltics	2	3	4	
TECHNICAL SKILLS				
Chooses appropriate equipment e.g. catheter , sheath, guidewire, balloon, stent	2	3	4	Required Component of Specialty Induction
Perform selective catheterization	2	3	4	Required Component of Specialty Induction
Manipulate catheter and wire across stenosis	2	3	4	Required Component of Specialty Induction
Performs balloon angioplasty in various vascular territories	2	3	4	Required Component of Specialty Induction
Performs primary stenting in various vascular territories	2	3	3	Desirable
Performs selective embolisation	2	2	3	
Use of closure devices	2	3	4	Desirable

OPEN VASCULAR SURGERY

OBJECTIVE

To gain open vascular surgical knowledge and skills

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Knows the importance of preoperative checks and team briefing for patient safety	4	4	4	
Antibiotic prophylaxis and anticoagulation	4	4	4	
Blood transfusion and the management of transfusion-related complications	4	4	4	
Intra-operative cell salvage and the use of other blood products	3	4	4	
Principles of local anaesthesia and local blocks e.g. metatarsal	3	4	4	
Common vascular skin incisions and exposures	3	4	4	
Methods of vascular control	3	4	4	
Principles of vascular reconstruction	3	4	4	
Intervention for VVs	3	4	4	
Selection of amputation level	3	4	4	
Types and characteristics of bypass grafts, anastomoses and vascular sutures	3	4	4	
Types and characteristics of vascular instruments	3	4	4	
CLINICAL SKILLS				
Explanation of open vascular surgery and the risks to a patient	3	4	4	Strongly recommended
Demonstrates good patient, personal and team safety	3	4	4	Desirable
Ensures good asepsis, especially when prosthetic materials are involved	3	4	4	
Good communication with patient and all members of the theatre team	3	4	4	Desirable
Accurate procedural record and post-procedural instructions	3	4	4	
TECHNICAL SKILLS				
Wound debridement	3	4	4	Desirable
Local amputation (e.g. toes)	3	4	4	Desirable
Major amputation (e.g. BKA)	2	3	4	Desirable
Harvesting of long saphenous (or other) vein	3	4	4	
Exposure and control of veins (e.g. SFJ)	3	4	4	Desirable
Exposure and control of arteries (e.g. common femoral)	3	4	4	Desirable
Arteriotomy and direct or patch repair	2	3	4	Required Component of Specialty Induction
End-to-end and end-to-side anastomosis	2	3	4	Required Component of Specialty Induction
Embolectomy + on-table arteriogram/thrombolysis	2	3	4	

ACUTE LOWER LIMB ISCHAEMIA

		ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Ability to recognise acute lower limb ischaemia and institute emergency management					
KNOWLEDGE					
Anatomy of arterial system		3	4	4	
Lower limb neurology		3	4	4	
Pathophysiology of acute limb ischaemia	Embolism	3	4	4	
	Thrombosis	3	4	4	
	Trauma (blunt penetrating)	3	4	4	
	Fractures & dislocations	2	3	3	
	Iatrogenic injury	3	4	4	
Pathophysiology of compartment syndrome		1	3	4	
Investigations	Doppler/Duplex	3	4	4	
	Angiography	3	4	4	
	Compartment pressures	3	4	4	
	Intra-operative angiogram	2	3	4	
	ECG & echocardiogram	3	4	4	
Management	Conservative	2	3	4	
	Embolectomy	2	3	4	
	Thrombolysis	2	3	4	
	Primary amputation	2	3	4	
CLINICAL SKILLS					
History		4	4	4	
Examination		4	4	4	
Co-ordination with trauma team		3	4	4	Desirable
TECHNICAL SKILLS					
Hand-held Doppler assessment		3	4	4	Desirable
Duplex ultrasound assessment		1	2	3	Desirable
Measurement of compartment pressures		3	4	4	
Surgical approaches to the arterial tree		2	3	4	Desirable
Surgical control of lower limb blood vessels		2	3	4	Desirable
Embolectomy (blind & directed, femoral/popliteal)		2	3	4	
On table angiography and thrombolysis		1	3	4	Desirable
Emergency arterial reconstruction		1	2	4	
Vascular shunts		2	3	4	
Lower leg fasciotomy		2	3	4	Desirable
Emergency venous reconstruction		1	2	3	
Percutaneous thrombolysis		1	2	2	

Percutaneous clot aspiration	1	2	2	

VASCULAR TRAUMA

		ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Identification, assessment and management of injuries to blood vessels and associated injuries					
KNOWLEDGE					
Surgical anatomy relative to fractures, nerves and associated structures		3	4	4	
Mechanisms of vascular injury (penetrating, blunt and iatrogenic)		3	4	4	
Low energy and high energy transfer injury		3	4	4	
Pathophysiology of trauma, muscle ischaemia and shock lung		3	4	4	
Pathophysiology of A-V fistula		2	3	4	
Investigations for bleeding/ischaemia (Duplex, CTA, on-table arteriography)		2	3	4	
Operative approach to specific injuries	Cervical, thoracic, abdominal, limb	2	3	4	
	Combined arterial and venous	2	3	4	
	Combined fractures and nerve injury	2	3	4	
CLINICAL SKILLS					
Symptoms and signs of acute arterial / venous injury		3	4	4	Desirable
Investigation (ABPI, Duplex, angiography)		2	3	4	Desirable
Assessment of multiply injured patient		3	4	4	Strongly recommended
Manage systemic effects of arterial trauma (e.g. rhabdomyolysis)		2	3	4	
TECHNICAL SKILLS					
Arrest haemorrhage by pressure, pack, tourniquet		3	4	4	Desirable
Recognise and treat sucking chest wound		3	3	4	
Chest drain		3	4	4	Strongly Recommended
Proximal vascular control		2	3	4	Desirable
Emergency thoracotomy		1	2	3	Desirable
Ligation		2	3	4	Desirable
Lateral suture repair		2	3	4	Desirable
End to end anastomosis		2	3	4	Required Component of Specialty Induction)
Interposition graft		1	2	4	Desirable
Panel / spiral grafts		1	2	3	Desirable
Fasciotomy		2	3	4	Desirable

Shunts	2	3	4	Desirable
On-table arteriography	1	2	2	
Endovascular balloon control	1	2	3	
Embolisation	1	1	1	
Insertion of covered stent	1	1	2	

CHRONIC LOWER LIMB ISCHAEMIA

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Management of the chronically ischaemic lower limb, including intervention				
KNOWLEDGE				
Anatomy and embryological development of arteries supplying the lower limb.	3	4	4	
Pathology of atherosclerosis, thrombosis and complications.	3	4	4	
Pathology of non –atherosclerotic arterial conditions (e.g. fibromuscular dysplasia, Buerger's disease, vasculitis and pyoderma gangrenosum)	2	4	4	
Vascular anomalies (e.g. persistent sciatic artery, cystic adventitial disease and popliteal entrapment)	2	4	4	
Role of medical treatment/exercise therapy	3	4	4	
Wound dressings & VAC	3	4	4	Desirable
CLINICAL SKILLS				
Selection for revascularisation or amputation	2	3	4	
Management of postoperative wound infection and graft complications	2	3	4	
Graft surveillance	2	3	4	
Amputation level selection	2	3	4	Desirable
Rehabilitation after amputation	2	3	3	
Lower limb prostheses	2	3	3	
TECHNICAL SKILLS				
Exposure of infrarenal aorta, iliac, femoral, popliteal, tibial and pedal vessels	1	3	4	Strongly recommended
Aorto-iliac & aorto-femoral bypass	1	2	4	Strongly Recommended
Axillo-femoral bypass	1	2	4	Strongly Recommended
Femoral and profunda endarterectomy and patch	1	3	4	Strongly Recommended
Ilio-fem and fem-fem bypass	1	3	4	Strongly Recommended
Above and below-knee fem-popliteal bypass	1	3	4	Strongly Recommended
Distal bypass (AT, PT, peroneal & pedal)	1	2	4	Strongly Recommended
Vein preparation in-situ/reversed/arm vein/SSV	2	4	4	Strongly Recommended
Vein cuff / patch	2	4	4	Strongly Recommended
Intra-operative assessment with Doppler and angiography	1	3	4	Strongly Recommended

Wound debridement	3	4	4	Strongly Recommended
Angioplasty/stenting aorta/iliac/SFA/popliteal/tibial	1	1	2	Desirable
Sartorius muscle flap	1	3	4	Desirable
Digital/ray amputation	2	4	4	Strongly recommended
Transmetatarsal/transtibial (Burgess, skew)/through knee/above knee amputation	1	3	4	Strongly recommended
Hindquarter amputation	1	2	3	

VASCULAR COMPLICATIONS OF DIABETES

	ST4	ST6	ST8	**Areas in which simulation should be used to develop relevant skills**
OBJECTIVE Assessment and management of patients with complications of diabetes affecting the leg/foot				
KNOWLEDGE				
Anatomy of the foot	3	4	4	Strongly recommended
Complications of diabetes affecting the foot including neuropathy, ulceration, osteomyelitis and Charcot	3	4	4	
Investigations (XRay, ultrasound & MR of foot, arteriography)	3	4	4	
Prevention of complications	3	4	4	
Orthotic devices and principles of offloading	3	4	4	
Interpretation of microbiology data and selection of antibiotics	3	4	4	
Emergency treatment for infection	3	4	4	
Revascularisation procedures	2	4	4	
CLINICAL SKILLS				
Explanation of principles of foot care to diabetic patients	3	4	4	Strongly recommended
Examination of diabetic foot/ulceration	3	4	4	
ABPI, pole test, 10g monofilament test	3	4	4	
Setting up a sliding scale	4	4	4	
TECHNICAL SKILLS				
Surgical debridement of foot	2	3	4	Strongly Recommended
Wound care	3	4	4	Strongly Recommended

VASCULAR DISEASE OF THE UPPER LIMB

OBJECTIVE
Ability to recognise and manage: (i) acute upper limb ischaemia, (ii) chronic upper limb ischaemia and (iii) thoracic outlet syndrome

KNOWLEDGE

		ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
Anatomy	Upper limb vasculature	3	4	4	
	Upper limb neurology	3	4	4	
	Thoracic outlet	2	3	4	
Pathology	Thromboembolic disease	3	4	4	
	Atherosclerotic disease	3	4	4	
	Thoracic outlet syndrome	2	3	4	
	Subclavian steal syndrome	2	3	4	
	Vasospastic disease	2	3	4	
	Trauma	2	3	4	
Management	Conservative (physiotherapy)	2	3	4	
	Pharmacological (anticoagulant/prostacyclin	2	3	4	
	Endovascular (angioplasty/stent)	2	3	4	
	Surgical (rib resection, embolectomy, bypass)	2	3	4	

CLINICAL SKILLS

Take a relevant history and examine the upper limb vessels and nerves including provocation tests	3	4	4	
Role of Doppler, duplex ultrasound, CT, MRA and conventional angiography.	3	4	4	
Selection for surgical/endovascular intervention	2	3	4	

TECHNICAL SKILLS

Exposure of subclavian, vertebral, axillary, brachial and radial arteries	1	3	4	Desirable
Brachial embolectomy	2	3	4	Desirable
Subclavian aneurysm repair	1	2	3	
Subclavian to brachial bypass	1	2	3	
Subclavian transposition	1	2	3	Desirable
Subclavian to carotid bypass	1	2	3	Desirable
Excision of cervical rib	1	2	3	Desirable
Thoracic outlet decompression (supraclavicular, infraclavicular and transaxillary approaches)	1	2	3	Desirable
Intra-operative arteriography and thrombolysis	1	3	4	
Subclavian artery angioplasty/ stenting	1	1	2	

HYPERHYDROSIS

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Assessment and management of patients with hyperhidrosis (palmar and axillary)				
KNOWLEDGE				
Anatomy and physiology of sympathetic nervous system	3	4	4	
Pathophysiology of hyperhydrosis	3	4	4	
Treatment options (antiperspirants, iontophoresis, thoracoscopic sympathectomy, botox, curettage)	3	4	4	
CLINICAL SKILLS				
History and examination	3	4	4	
Management strategy	2	3	4	
TECHNICAL SKILLS				
Axillary Botox therapy	1	2	3	
Thoracoscopic sympathectomy	1	2	3	
Axillary curettage	1	2	3	

VASOSPASTIC DISORDERS AND VASCULITIS

OBJECTIVE

Assessment and management of patients with vasospastic disorders (primary and secondary) and vasculitis

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Anatomy and physiology of sympathetic nervous system	3	4	4	
Pathophysiology of primary and secondary vasospastic disorders (e.g. Raynaud's disease, thoracic outlet compression, Vibration White Finger)	2	3	4	
Connective tissue disease (systemic sclerosis, SLE, rheumatoid arthritis)	2	3	4	
Vasculitis (Buerger's disease, Takayasu's, giant cell arteritis, PAN, HIV, TB)	2	3	4	
Investigations (Cold provocation, blood tests, nail-fold capillaroscopy)	2	3	4	
Treatment options (Cold avoidance, smoking cessation, vasodilators (e.g. calcium channel blockers), digital sympathectomy, chemotherapy, retroviral therapy)	2	3	4	
CLINICAL SKILLS				
History and examination	3	4	4	
Management strategy	2	3	4	
TECHNICAL SKILLS				
Skin biopsy	2	4	4	Strongly Recommended
Digital sympathectomy	1	1	1	
Thoracic outlet decompression	1	2	3	Desirable

CAROTID ARTERY DISEASE

OBJECTIVE

Assessment and management of patients with cerebrovascular disease. Surgical management of patients with carotid artery territory symptoms

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Anatomy and pathophysiology of stroke	3	4	4	
Classification of stroke	2	4	4	
Stroke severity score	2	4	4	
Definition of TIA and differential diagnosis	3	4	4	
Aetiology and epidemiology of stroke	2	4	4	
Guidelines for management of hypertension and hyperlipidaemia (BHS, NICE, RCP, SIGN)	2	4	4	
Indications and use of investigations (CT/A, MRI/A, carotid duplex, echocardiogram)	2	4	4	
Indications for medical or interventional treatment	2	4	4	
Acute intervention including thrombolysis	2	4	4	
Stroke prevention (antiplatelets, anticoagulants)	1	4	4	
Selection for carotid endarterectomy and stenting	1	4	4	
Carotid body tumours	1	2	3	
Carotid dissection	1	2	3	
Carotid trauma	1	2	4	
CLINICAL SKILLS				
Medical management (antiplatelet agents, hypertension, hyperlipidaemia)	3	4	4	
Communication of risks and benefits of intervention	3	4	4	Strongly recommended
Assess post-op complications (stroke, bleeding, airway obstruction, cranial nerve injury)	3	4	4	
TECHNICAL SKILLS				
Cervical block	1	2	3	
Standard and retrojugular approach	1	3	4	Desirable
Standard and eversion endarterectomy	1	3	4	Desirable
Use of carotid shunts	1	3	4	Desirable
Distal intimal tacking sutures	1	3	4	Desirable
Primary and patch closure	1	3	4	Desirable
Use and interpretation of intra-operative quality control: (angioscopy, duplex ultrasound or completion arteriography)	1	3	4	Desirable
Re-do carotid endarterectomy	1	2	3	
Placement of guidewire and catheter	1	1	2	
Placement of cerebral protection device	1	1	2	
Endovascular stent	1	1	2	

ANEURYSM - ELECTIVE

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE				
Assessment and management of elective aneurysms				
KNOWLEDGE				
Anatomy of aorta and main branches	4	4	4	
Pathology of aortic aneurysms (atherosclerotic inflammatory, mycotic, collagen disorders, post-dissection, vasculitic)	3	4	4	
Aortic dissection	2	3	4	
Thoracoabdominal aneurysms	2	3	4	
Pathology of other aneurysms (popliteal, visceral, carotid, subclavian, false aneurysms)	2	3	4	
Investigation – US, CT A, MRA and PET	3	4	4	
Treatment options (medical, open, EVAR, hybrid)	2	3	4	
CLINICAL SKILLS				
History and examination, palpation of aorta	3	4	4	
Assessment of comorbidity, cardiorespiratory/renal	3	4	4	
Endovascular planning	2	3	4	Strongly recommended
Ability to recognise/manage postop. complications: bleeding, thrombosis, embolism, organ failure, endoleak, infection	2	3	4	
TECHNICAL SKILLS				
Open repair infrarenal AAA	1	3	4	Strongly Recommended
Inflammatory AAA repair	1	2	3	
Internal iliac aneurysm repair	1	2	3	
Juxta-renal AAA repair	1	2	3	Desirable
Supra-renal AAA repair	1	2	3	Desirable
Thoraco-abdominal aneurysm open repair	1	2	2	
Thoraco-abdominal aneurysm hybrid repair	1	2	2	
Popliteal aneurysm repair	1	3	4	
Visceral aneurysm repair	1	2	3	
Carotid aneurysm repair	1	2	3	
Subclavian aneurysm repair	1	2	3	
Repair femoral false aneurysm	2	3	4	
Re-operation for infected graft	1	2	3	
Endovascular repair infrarenal AAA	2	3	4	Required Component of Specialty Induction
Internal iliac artery/aneurysm coiling	2	2	3	
Aorto-uniliac stent-graft, iliac occluder & crossover graft	2	3	4	Desirable
Juxta-renal or suprarenal AAA – fenestrated /branched stent	2	2	3	Desirable

Thoracic aneurysm/dissection stentgraft	2	3	3	Desirable
Correction of endoleak	2	2	3	
Stenting of peripheral/visceral aneurysm	2	2	3	

ANEURYSM - EMERGENCY

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE				
Assessment and management of emergency aneurysms				
KNOWLEDGE				
Risk factors for aneurysm rupture	4	4	4	
Appropriate/timely investigation of an emergency aneurysm (acute/ruptured)	3	4	4	Desirable
Open and endovascular treatment options	3	4	4	Desirable
Surgical methods of immediate aortic control - supra- coeliac and infrarenal	3	4	4	
Intra-abdominal compartment syndrome	3	4	4	
CLINICAL SKILLS				
History and examination	4	4	4	
Assessment of co-morbidity	3	4	4	
Selection of patients for conservative management, open or endovascular repair	2	3	4	Desirable
Recognise/manage complications	2	3	4	
TECHNICAL SKILLS				
Open repair ruptured infrarenal AAA	1	2	4	
Suprarenal/supracoeliac clamp	1	3	4	Desirable
Femoral thrombectomy and or additional lower limb revascularisation.	1	2	4	
Balloon control of aorta	1	2	4	
Endovascular repair ruptured infrarenal AAA	1	2	3	Desirable
Endovascular stenting of acute aortic dissection	1	1	2	Desirable
Endovascular stenting of acute aortic transection	1	1	2	Desirable
Aorto-uniliac stent-graft, iliac occluder and crossover graft	1	2	2	

VASCULAR ACCESS (VA)

OBJECTIVE
To describe need for VA, common methods of VA, establish VA
and manage complications of VA

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Anatomy of upper and lower limb arteries and veins	3	4	4	
List indications for VA	3	4	4	
Knowledge of methods of renal support; advantages and disadvantages	3	4	4	
Physiology of arterio-venous fistulae	2	3	4	
Knowledge of conduit material	2	3	4	
List complications of VA	3	4	4	
Knowledge of preoperative investigations including ultrasound	2	3	4	
CLINICAL SKILLS				
Pre-operative assessment and choice of VA	1	2	4	
Arrange appropriate investigations	1	2	4	
Ultrasound assessment of patient needing vascular access	1	1	3	
TECHNICAL SKILLS				
Radio-cephalic AVF	1	2	4	Desirable
Brachiocephalic fistula	1	2	4	Desirable
Basilic vein transposition AV fistula	1	2	4	Desirable
Create forearm loop graft	1	2	3	Desirable
Create thigh loop graft	1	2	3	Desirable
Saphenous vein transposition AV fistula	1	2	3	
On-table fistulogram/angioplasty	1	2	3	
Graft thrombectomy and revision	1	2	3	
Ligation/excision of fistula or graft	1	2	4	
DRIL or other salvage procedure	1	2	3	
Complex revision procedures	1	1	3	
Percutaneous fistulography and endovascular intervention	1	1	2	
Ultrasound-guided cannulation of jugular vein and femoral artery	1	2	3	Desirable
Insert central venous dialysis catheter	1	2	3	Strongly Recommended
Insert peritoneal dialysis catheter	2	3	4	Strongly Recommended

RENOVASCULAR DISEASE AND TRANSPLANTATION

OBJECTIVE
Knowledge and management of vascular problems related to renal disease and vascular surgical problems in patients with renal disease and renal transplantation

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Renal & reno-vascular anatomy	2	3	4	
Role of kidney in control of blood pressure	2	3	4	
Role of kidney in calcium homeostasis	2	3	4	
Pathophysiology of chronic kidney disease	2	3	4	
Pathophysiology of acute kidney injury	2	3	4	
Pre-renal: shock, trauma, sepsis, atherosclerosis	2	3	4	
Renal: intrinsic renal disease, toxins	2	3	4	
Post renal: obstruction, stone, tumour	2	3	4	
CLINICAL SKILLS				
Pre-operative assessment	2	3	4	
Arrange appropriate investigations	1	2	4	
Role of CT angiography in assessing renal disease	2	3	4	
Indications for renal angiography/angioplasty	2	3	4	
Indications for retrograde Ureteric imaging	1	2	3	
Indications for isotope renography	2	3	3	
Indications for selective renal vein sampling	2	3	3	
Indications for renal biopsy	2	3	3	
TECHNICAL SKILLS				
Open approach to kidney	2	3	4	Desirable
Laparoscopic approach to kidney	1	2	2	
Exposure of renal vessels	2	3	4	Desirable
Renal artery Endarterectomy/bypass	2	3	3	
Open surgical nephrectomy	1	2	3	
Radiological access to renal arteries	1	2	3	Desirable
Renal artery embolisation	1	2	2	
Renal artery angioplasty	1	2	2	

Living kidney donor nephrectomy open/laparoscopic	1	2	2	
Renal autotransplant	1	2	3	
Renal allotransplant	1	2	3	
Transplant nephrectomy	1	1	2	

MESENTERIC VASCULAR DISEASE

OBJECTIVE

Assessment and management of patients with acute and chronic mesenteric ischaemia

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Anatomy of mesenteric arterial and venous system	3	4	4	
Physiology of mesenteric vasculature	3	4	4	
Pathophysiology of mesenteric ischaemia	3	4	4	
Presentation of mesenteric vascular disease - acute and chronic	3	4	4	
Investigation - Mesenteric angiography, CT	2	3	4	Desirable
Treatment - Medical, surgical, endovascular	1	2	3	
Complications	2	3	4	
CLINICAL SKILLS				
History and examination of acute and chronic presentation	2	3	4	
Resuscitation	3	4	4	
Interpretation of investigations	2	3	4	
General management	2	3	4	
TECHNICAL SKILLS				
Radiological intervention (lysis, angioplasty, stenting)	1	1	1	
Mesenteric thromboembolectomy	1	2	3	
Mesenteric bypass	1	2	3	

SUPERFICIAL VENOUS DISEASE

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Assessment and management of varicose veins, including recurrent veins and complications				
KNOWLEDGE				
Anatomy of the superficial venous system	3	4	4	
Physiology of venous dynamics	3	4	4	
Graduated support	4	4	4	
Pathology of superficial venous incompetence	3	4	4	
Neovascularisation	1	2	4	
Recanalisation	1	2	4	
Pelvic venous reflux	1	2	4	
Complications of venous hypertension	2	3	4	
Oedema, lipodermatosclerosis, ulceration, bleeding, recurrence	2	3	4	
CLINICAL SKILLS				
Presenting symptoms and complications	4	4	4	
Examination varicosities and venous incompetence	4	4	4	
Identify complications	3	3	4	
Interpretation of venous duplex	2	3	4	Required Component of Specialty Induction
Interpretation of venography	1	2	3	Desirable
Interpretation of plethysmography	1	2	3	
Management options (conservative, sclerotherapy, endovenous thermal ablation, surgery)	3	4	4	
TECHNICAL SKILLS				
Apply compression bandage	2	3	4	
Injection sclerotherapy	2	3	4	
Truncal foam sclerotherapy	1	3	4	
Cannulate long and short saphenous veins under US control	1	3	4	Required Component of Specialty Induction
Endovenous thermal ablation (EVLT/VNUS)	1	3	4	Desirable
Surgery (multiple phlebectomies, sapheno-femoral junction ligation, sapheno-popliteal junction ligation, long saphenous vein strip)	3	4	4	
Recurrent varicose vein surgery	2	3	4	

DEEP VENOUS THROMBOSIS

OBJECTIVE

Assessment and management of patient with deep venous thrombosis

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Anatomy of deep veins lower limb / pelvis	3	4	4	
Pathophysiology of thrombosis and DVT	2	3	4	
Management of uncomplicated DVT	3	4	4	
Early / late complications of DVT	2	3	4	
Thrombophilia	2	3	4	
Thromboprophylaxis	4	4	4	
Investigations(Ultrasound, duplex, V/Q scans, CTPA)	3	4	4	
Indications for intervention (caval filters, thrombolysis, surgical thrombectomy	2	3	4	
CLINICAL SKILLS				
History and examination	4	4	4	
Investigation (Duplex, interpretation MRV and CTPA)	2	3	4	Desirable
	2	4	4	
TECHNICAL SKILLS				
Endovenous therapy (thrombolysis)	1	2	3	
Venous thrombectomy	1	2	3	
Insertion and removal of caval filter	1	2	2	

DEEP VENOUS INSUFFICIENCY

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Assessment and management of patient with deep venous insufficiency				
KNOWLEDGE				
Pathology of deep venous insufficiency (DVT, valvular dysfunction, valvular agenesis)	2	3	4	
Management options (compression systems, valvuloplasty, valve transplant, bypass, amputation)	2	3	4	
CLINICAL SKILLS				
History - identify risk factors	2	4	4	
Examination - diagnose complications	2	4	4	
Investigation – Duplex, venography, plethysmography)	2	3	4	
TECHNICAL SKILLS				
Apply compression bandage	2	3	4	
Biopsy of leg ulcer	2	4	4	
Perforator ligation	1	3	4	
Deep venous reconstruction	1	2	3	
Venous bypass (e.g. Palma)	1	2	3	
Iliac venous stent	1	1	1	

LYMPHOEDEMA

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE				
Assessment and management of patients with lymphoedema				
KNOWLEDGE				
Anatomy of lymphatic system	2	3	4	
Physiology	2	3	4	
Pathophysiology	2	3	4	
Classification of lymphoedema (primary and secondary)	1	3	4	
Clinical features	2	3	4	
Complications - chronic effects	1	3	4	
Investigation – lymphoscintigraphy, lymphangiogram, CT/ MRI	1	3	4	
Management – manual compression, compression bandaging, compression hosiery, surgical options	1	3	4	
CLINICAL SKILLS				
History and examination	2	3	4	
Interpretation of investigations	1	3	4	
Management plan	1	2	4	
TECHNICAL SKILLS				
Application of compression bandage	1	2	3	Desirable
Treatment of lymphocoeles and lymphatic leaks	2	3	4	

SUPERFICIAL SEPSIS INCLUDING NECROTISING INFECTIONS

OBJECTIVE
Diagnosis and basic management of gas gangrene and other necrotising infections.

		ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE					
Superficial abscess	Aetiology	4	4	4	
	Bacteriology	4	4	4	
	Treatment (aspiration or incision and drainage)	4	4	4	
Cellulitis	Aetiology	4	4	4	
	Bacteriology	4	4	4	
	Antibiotic therapy	4	4	4	
Gas gangrene and other necrotising Infections	Aetiology	4	4	4	
	Bacteriology	4	4	4	
	Risk factors (diabetes, atherosclerosis, steroids and immunocompromised)	4	4	4	
	Antibiotic therapy and debridement	4	4	4	
Mechanisms of septic shock		4	4	4	
Appropriate antibiotic therapy		4	4	4	
Necrotising fasciitis		4	4	4	
CLINICAL SKILLS					
Superficial abscess	History, examination and management	4	4	4	
Cellulitis	History, examination and management	4	4	4	
Necrotising fasciitis	History, examination and management	4	4	4	
TECHNICAL SKILLS					
Superficial abscess	Abscess drainage or aspiration under ultrasound control	2	3	3	Desirable
Necrotising fasciitis	Debridement or radical excisional surgery	2	3	4	Desirable

ABDOMINAL WALL

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Management of abnormalities of the abdominal wall, excluding hernia				
KNOWLEDGE				
Anatomy of the abdominal wall	4	4	4	
Pathology of acute and chronic conditions (haematoma, sarcoma, desmoid tumours)	4	4	4	
CLINICAL SKILLS				
Ability to determine that a swelling is in the abdominal wall	3	4	4	
Initiate appropriate investigation (e.g. ultrasound, biopsy)	3	4	4	
TECHNICAL SKILLS				
Conservative management of haematoma	3	4	4	

LAPAROSCOPIC SURGERY

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE To understand the principles of laparoscopic surgery including technical aspects and common complications				
KNOWLEDGE				
Physiology of pneumoperitoneum	4	4	4	
Technology of video imaging, cameras and insufflator	4	4	4	
Laparoscopic instruments, clips, staplers and port types	4	4	4	
Use and dangers of diathermy	4	4	4	
Management of equipment failure	3	3	3	
Anaesthetic problems in laparoscopic surgery	3	3	3	
Informed consent for laparoscopic procedures	4	4	4	
Recognition and management of laparoscopic complications	3	3	3	
CLINICAL SKILLS				
Pre and postoperative management of laparoscopic cases	4	4	4	
TECHNICAL SKILLS				
Closed and open techniques for port insertion	4	4	4	Desirable
Diagnostic laparoscopy	3	3	3	Strongly recommended
Laparoscopic suturing and knotting	3	3	3	
Control of laparoscopic bleeding	3	3	3	

ELECTIVE HERNIA

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Diagnosis and management, including operative management of primary and most recurrent abdominal wall hernia				
KNOWLEDGE				
Anatomy of inguinal region including inguinal canal, femoral canal, abdominal wall and related structures e.g. adjacent retro-peritoneum and soft tissues.	4	4	4	
Relationship of structure to function of anatomical structures.	4	4	4	
Natural history of abdominal wall hernia including presentation, course and possible complications	4	4	4	
Treatment options	4	4	4	
Current methods of operative repair including open mesh, laparoscopic mesh and posterior wall plication, to include the underlying principles, operative steps, risks, benefits, complications and process of each	4	4	4	
CLINICAL SKILLS				
Diagnose and assess a patient presenting with common abdominal wall hernias, including inguinal, femoral, epigastric, umbilical and paraumbilical.	4	4	4	
Supervise the postoperative course	4	4	4	
TECHNICAL SKILLS				
Hernia repair-femoral	3	3	3	
Hernia repair-inguinal	3	3	3	Strongly Recommended
Hernia repair-incisional	3	3	3	
Hernia repair- TEPS	3	3	3	
Hernia repair- TAPS	3	3	3	

ACUTE ABDOMEN

	ST 4	ST 6	ST 8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Assessment, resuscitation and management of patients with acute abdomen				
KNOWLEDGE				
Abdominal anatomy	4	4	4	
Causes of the acute abdomen	4	4	4	
Pathophysiology of shock	4	4	4	
Pathophysiology of peritonitis and sepsis	4	4	4	
CLINICAL SKILLS				
History and examination	4	4	4	Desirable
Resuscitation	4	4	4	Desirable
Arrange Investigation (ultrasound, CT)	4	4	4	
Indication for surgery	4	4	4	
TECHNICAL SKILLS				
Central line insertion under US guidance	3	3	3	Strongly Recommended
Diagnostic laparotomy	4	4	4	Desirable
Diagnostic laparoscopy	3	3	3	Strongly Recommended
Abdominal lavage	4	4	4	

ACUTE INTESTINAL OBSTRUCTION

OBJECTIVE

Recognise and manage most cases of postoperative intestinal obstruction in conjunction with abdominal surgeons

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Abdominal anatomy	4	4	4	
Aetiology of intestinal obstruction	4	4	4	
Pathophysiology of shock / sepsis	4	4	4	
Differential diagnosis	4	4	4	
Treatment options	4	4	4	
CLINICAL SKILLS				
History and examination	4	4	4	
Resuscitation	4	4	4	
Arrange investigation (CT and contrast studies)	4	4	4	
Nutritional support	4	4	4	
TECHNICAL SKILLS				
Central line insertion under US guidance	3	3	3	Strongly Recommended
Laparotomy and division of adhesions	4	4	4	
Small bowel resection	4	4	4	Strongly Recommended
Large bowel resection/stoma	3	3	3	

GASTROINTESTINAL BLEEDING

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Assessment of all cases of gastrointestinal bleeding, management and referral to subspecialists as needed				
KNOWLEDGE				
Blood loss and hypotension/physiology of hypovolaemia	4	4	4	
Coagulopathy	4	4	4	
Recognition of all causes of GI bleeding	4	4	4	
Role of endoscopy and CT angiography	3	3	3	
Indications for operation	3	3	3	
Role of endoscopic procedures and therapeutic radiology	3	3	3	
Postoperative care and fluid balance	4	4	4	
CLINICAL SKILLS				
Resuscitation of hypotensive patient	4	4	4	Desirable
HDU care	3	3	3	
Clinical assessment of cause of bleeding	4	4	4	
Organise appropriate endoscopy or other investigation	4	4	4	
Advise appropriate surgery	3	3	3	
Recognition of re-bleeding and postoperative problems	3	3	3	
Treatment of complications	3	3	3	
TECHNICAL SKILLS				
Laparotomy for bleeding	3	3	3	

ABDOMINAL INJURIES

	ST 4	ST6	ST 8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Identify and manage the majority of abdominal injuries				
KNOWLEDGE				
Anatomy of abdomen	4	4	4	
Aetiology	4	4	4	
Pathophysiology of shock	4	4	4	
Differences in Children	4	4	4	
Principles of management of severely injured patients	4	4	4	
Importance of mechanism of injury (gun shot, stabbing, seat belt)	4	4	4	
Indications for un-crossmatched blood	4	4	4	
Coagulopathy	4	4	4	
Pathophysiology of peritonitis and sepsis	4	4	4	
Principles of damage control surgery	4	4	4	
CLINICAL SKILLS				
History and examination	4	4	4	Strongly Recommended
Resuscitation	4	4	4	Strongly Recommended
Investigation	4	4	4	Strongly Recommended
Appropriate use of CT and FAST scanning	4	4	4	Strongly Recommended
Indications for intervention	4	4	4	Strongly Recommended
Recognition of injuries requiring other specialties	4	4	4	Strongly Recommended
Management of hollow organ injury	3	3	3	Strongly Recommended
TECHNICAL SKILLS				
Central line insertion	3	3	3	Strongly Recommended
Laparotomy	4	4	4	Desirable
Laparoscopy	3	3	3	Desirable
Liver trama - debridement / packing	2	2	2	Desirable
Pancreatectomy - distal	2	2	2	

Splenectomy	3	3	3	Desirable
Splenic repair	2	2	2	
Small bowel repair/resection	4	4	4	Strongly Recommended
Large bowel resection/stoma	3	3	3	
Nephrectomy	2	2	2	

GASTRIC STASIS, PARALYTIC ILEUS AND CONSTIPATION

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Management of postoperative gastric stasis, pseudo-obstruction and constipation				
KNOWLEDGE				
Normal gastric, small bowel and colonic physiology (including gut hormones and peptides) and the process of defaecation	4	4	4	
Classification of types and causes of postoperative gastric stasis, pseudo-obstruction and constipation	4	4	4	
Prokinetic and anti-emetic agents	4	4	4	
Different types of laxatives and describe the indications, contraindications, modes of action, and complications of each: stimulant, osmotic, bulk-forming, lubricant	4	4	4	
CLINICAL SKILLS				
Take a history from a patient with postoperative vomiting, abdominal distension or constipation and perform an appropriate physical examination	4	4	4	
Arrange appropriate investigations and management	4	4	4	
TECHNICAL SKILLS				
Insertion of NG tube	4	4	4	

ISCHAEMIC AND INFECTIOUS COLITIS

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVES Management of ischaemic colitis and clostridium difficile colitis.				
KNOWLEDGE				
Vascular anatomy of the colon	4	4	4	
Epidemiology, aetiology, pathogenesis, investigation, medical management and indications for surgery of ischaemic colitis	4	4	4	
Epidemiology, aetiology, pathogenesis, investigation and treatment of clostridium difficile colitis	4	4	4	
CLINICAL SKILLS				
Management of ischaemic and infective colitis	4	4	4	
Manage ischaemic colitis after abdominal aortic aneurysm repair	3	3	4	
Management of clostridium difficile	4	4	4	
TECHNICAL SKILLS				
Sigmoid colectomy in conjunction with colorectal surgeons	3	3	3	

RETICULO-ENDOTHELIAL SYSTEM

OBJECTIVE
Management of conditions affecting the reticulo-endothelial and haemopoetic systems.

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Causes of lymphadenopathy	3	3	4	
Indications for elective splenectomy-haemolytic anaemia, ITP, thrombocytopaenia, myeloproliferative disorders	3	3	3	
Indications for emergency splenectomy	4	4	4	
Sequelae of splenectomy	4	4	4	
Role of splenic embolisation	3	3	3	
CLINICAL SKILLS				
Planning appropriate diagnostic tests for lymphatic conditions	3	3	3	
Planning appropriate treatment schedule for conditions involving the spleen in consultation with haematologist	2	3	3	
TECHNICAL SKILLS				
Lymph node FNA	4	4	4	Desirable
Lymph node biopsy-groin, axilla	4	4	4	Desirable
Block dissection lymph nodes	1	2	3	
Emergency splenectomy	3	3	3	