



Essential Surgical Skills

Recommended skills to be gained by the end of Post Graduate Year 2 (PGY2) prior to entry into Surgical Education and Training (SET)

Recommended skills for General Practice Proceduralists

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Introduction

The information provided in this document is intended as a guide for:

- o **Medical students and pre-vocational doctors** to build their portfolio as they prepare for application to surgical training
- o **Hospital supervisors** to assist them in providing relevant clinical experience for residents intending to apply for surgical education and training; and
- o **Educators** to assist them in developing learning resources relevant for surgical education and training

This document complements the [RACS Junior Doctors Framework](#), [Australian Curriculum Framework for Junior Doctors](#) and should be read in conjunction with the [RACS Nine Surgical Competencies](#).

This document is intended as a guide. Specialty training boards may identify which skills are specific for their SET selection criteria.

Achieving competency in Essential Surgical Skills

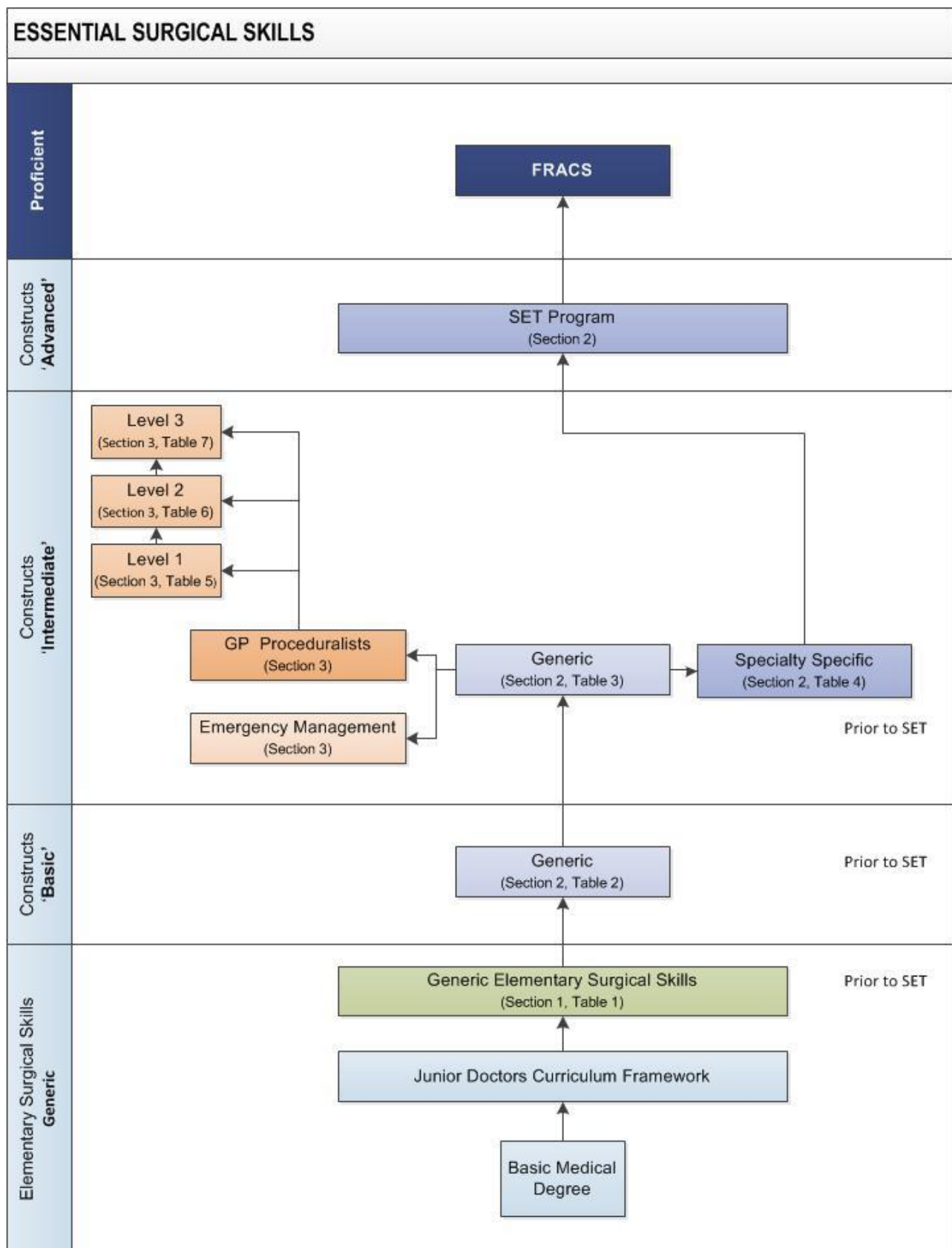
The surgical skills and constructs outlined in this document may be tracked and assessed through a variety of methods including log books, training portfolios and completion of skills courses. Each specialty training board determines the assessment requirements for achieving these skills as part of the SET selection criteria for that specialty.

Key terms

PGY:	Post Graduate Year
SET:	Surgical Education and Training (RACS surgical training program)
RACS:	Royal Australasian College of Surgeons
College:	Royal Australasian College of Surgeons
GP:	General Practice

Progression of surgical skills acquisition

Figure 1



Section 1. Generic elementary surgical skills

There are nine generic elementary surgical skills which can be acquired in a supervised clinical or simulated environment prior to application to SET.

Skill 1	Standard precautions
Skill 2	Instrumentation
Skill 3	Diathermy
Skill 4	Using sutures, surgical knots, needles
Skill 5	Surgical wounds and tissue handling
Skill 6	Insertion and care of wounds and drains
Skill 7	Splinting and immobilisation
Skill 8	Local anaesthetic (dermal and sub-cutaneous)
Skill 9	Peri-operative life support

Generic elementary surgical skills

Table 1

Skill 1 - Standard precautions			
Elements	Observe	Describe	Perform
Standard precautions			
Infection control	✓	✓	✓
Safe management of sharps	✓	✓	✓
Positioning the patient			
Understanding pressure points and potential injury	✓	✓	
Neurovascular protection	✓	✓	
Joint and axial skeleton protection	✓	✓	
Patient security	✓	✓	
Personal protection			
Scrubbing	✓	✓	✓
Gowning	✓	✓	✓
Gloving	✓	✓	✓
Splash protection	✓	✓	✓
Prepping and draping			
Establish and maintain sterility and integrity of operative field	✓	✓	✓
Appropriate selection and application of skin preparation agent	✓	✓	✓
Surgical etiquette			
Participate in surgical checklist	✓	✓	✓
Participate in team time out	✓	✓	✓

Skill 2 - Instrumentation			
Elements	Observe	Describe	Perform
Scissors			
Able to name types of scissors and explain indications for appropriate and safe use	✓	✓	✓
Safe and correct handling and use	✓	✓	✓
Understands mechanism of action of scissors	✓	✓	✓
Care of scissor blades	✓	✓	✓
Demonstrates ability to pass and receive scissors safely	✓	✓	✓
Needle holders			
Selects needle holder of appropriate weight and length	✓	✓	✓
Safe and correct handling and use	✓	✓	✓
Pass and receive needle holders safely	✓	✓	✓
Tissue holding forceps			
Selection of appropriate forceps	✓	✓	✓
Thumb (non-locking) forceps	✓	✓	✓
Locking forceps	✓	✓	✓
Tooth and non-tooth	✓	✓	✓
Safe and correct handling and use	✓	✓	✓
Retractors			
Selection of appropriate retractors	✓	✓	✓
Hand held	✓	✓	✓
Self-retaining	✓	✓	✓
Safe, correct handling; use and risk of tissue damage	✓	✓	✓
Scalpel			
Select appropriate blade	✓	✓	✓
Safe and correct mounting of blade	✓	✓	✓
Principles of holding and using	✓	✓	✓
Able to pass scalpel safely using a safety dish	✓	✓	✓
Able to perform a long cut with square edges at appropriate depth, without slicing or multiple passes	✓	✓	✓
Skin staples			
Indications for use of skin staples	✓	✓	✓
Correct application	✓	✓	✓
Safe removal	✓	✓	✓

Skill 3 - Diathermy			
Elements	Observe	Describe	Perform
Diathermy action as they relate to:			
Monopolar	✓	✓	
Bipolar	✓	✓	
Cutting	✓	✓	
Coagulation	✓	✓	
Electrosurgical circuit		✓	
Impedance and capacitance		✓	
Indications for use		✓	
Diathermy safety			
Heat dissipation, capacitive coupling, short circuit, tissue impedance (including risk to pedicles) and the effect of dessication, arcing, insulation failure, plume management, ignition hazards and with implanted devices		•✓	

Skill 4 - Using sutures, surgical knots, needles			
Elements	Observe	Describe	Perform
Suture selection			
Synthetic versus organic	✓	✓	
Braided vs monofilament	✓	✓	
Absorbable vs non-absorbable	✓	✓	
Tensile strength	✓	✓	
Suture needles			
Round bodied vs cutting	✓	✓	
Needle size and curvature	✓	✓	
Single vs double armed	✓	✓	
Correct mounting on needle holder	✓	✓	✓
Knot tying, principles and practice			
Selection of appropriate materials	✓	✓	✓
Knot security	✓	✓	✓
Able to tie a square knot proficiently	✓	✓	✓
Instrument technique	✓	✓	✓
One handed technique	✓	✓	✓
Two handed technique	✓	✓	✓

Skill 5 - Surgical wounds and tissue handling			
Elements	Observe	Describe	Perform
Wound management			
Wound classification	✓	✓	
Clean versus contaminated	✓	✓	
Necrotising infections	✓	✓	
Mechanism of wounding	✓	✓	
Wound healing & factors affecting wound healing	✓	✓	
Dressings	✓	✓	✓
Debridement	✓	✓	✓
Wound closure	✓	✓	✓
Healing by primary intention	✓	✓	✓
Healing by secondary intention	✓	✓	
Delayed primary closure	✓	✓	
Vacuum assisted wound management	✓	✓	✓
Atraumatic tissue management			
Careful tissue handling	✓	✓	✓
Traction and retraction	✓	✓	✓
Correct application of instruments	✓	✓	
Neuro-vascular protection	✓	✓	

Skill 6 - Insertion and care of tubes and drains			
Elements	Observe	Describe	Perform
Use of drains and tubes			
Indications for safe use		✓	
Functions of tubes		✓	
Drain security	✓	✓	✓
Drain complications	✓	✓	
Urinary catheter			
Urethral	✓	✓	✓
Supra-pubic	✓	✓	
Nephrostomy tube	✓	✓	
Wound drains			
Suction versus passive	✓	✓	
Open versus closed	✓	✓	
Vascular			
Arterial	✓	✓	✓
Venous	✓	✓	✓
Peripheral	✓	✓	✓
Central	✓	✓	
Other drains and tubes			
Naso-gastric/Naso-enteric	✓	✓	✓
Intercostal catheter - Under water seal drains	✓	✓	✓
Gastrostomy	✓	✓	
Jejunostomy	✓	✓	
Radiologically placed drains	✓	✓	

Skill 7 - Splinting and immobilisation			
Elements	Observe	Describe	Perform
Principles of immobilisation			
Indications for immobilisation		✓	
Preservation of position and function		✓	
Prevention of complications			
Pressure point		✓	✓
Compartment syndrome		✓	✓
Selection of appropriate materials	✓	✓	✓
Correct and safe application			
Limb splint	✓	✓	✓
Plaster of Paris cast– upper limb /lower limb	✓	✓	✓
Skin traction		✓	
Hand splints	✓	✓	✓
Spine and pelvic immobilisation	✓	✓	✓

Skill 8 - Local anaesthetic (dermal and sub-cutaneous)			
Elements	Observe	Describe	Perform
Safe and appropriate use of local anaesthetic agents for minor procedures			
Wound infiltration	✓	✓	✓
Skin infiltration	✓	✓	✓
Digital nerve blocks	✓	✓	✓
Selection of appropriate agent			
Short acting	✓	✓	✓
Long acting	✓	✓	✓
Vaso-active agents	✓	✓	✓
Pharmacokinetics			
Dosage	✓	✓	
Duration of action	✓	✓	
Adverse effects and management			
Local injury		✓	
Systemic effects		✓	

Skill 9 - Peri-operative life support			
Elements	Observe	Describe	Perform
Basic airway management			
Clearing the airway	✓	✓	✓
Oxygen delivery	✓	✓	✓
Bag mask ventilation	✓	✓	✓
Oxygen delivery			
Nasal prongs	✓	✓	✓
Mask	✓	✓	✓
Reservoir mask	✓	✓	✓
CPAP	✓	✓	✓
Indications for ventilatory support	✓	✓	
Indications for definitive airway	✓	✓	
Safe practices for circulatory support			
Emergency venous access	✓	✓	✓
Monitoring and assessment	✓	✓	✓
External haemorrhage control	✓	✓	✓
IV fluid resuscitation	✓	✓	✓
Transfusion of blood	✓	✓	✓
Transfusion of blood products	✓	✓	✓
Management of complications	✓	✓	✓
Prevention of hypothermia	✓	✓	✓

Section 2. Surgical Constructs

A surgical construct is an assembly of elementary surgical skills (listed in Section 1) that forms a component of a surgical procedure.

For example, to undertake a procedure a Trainee, under appropriate supervision, would:

- perform a checklist
- position the patient appropriately
- scrub, gown and glove
- prepare and drape the area
- select the appropriate instruments
- maintain infection control
- handle tissues appropriately
- manage the wound

As a Trainee acquires more skills, they are able to perform larger constructs and more complex procedures.

The extent of supervision required varies according to the level of skills acquired by the doctor. Throughout a doctor's training, a Trainee acquires experience across the [nine RACS surgical competencies](#) until able to safely manage the condition of the surgical patient.

A doctor in an emergency department or a rural hospital who is not a surgeon or surgical Trainee may possess the skills required to undertake some surgical constructs.

This means that the skills listed in Table 1 can be combined to construct a range of tasks that doctors as part of a surgical "team" could perform with varying degrees of supervision by a consultant surgeon. Figure 1 (below) sets out diagrammatically the configuration of constructs that doctors in different clinical settings may be able to perform providing they have the required elementary surgical skills. Each level or group corresponds to a table that lists the skills or constructs that should be attained. The boxes shaded in blue represent the pathway for doctors who enter the SET Program to achieve FRACS.

Levels of surgical constructs

Surgical constructs are divided into three levels:

- | | |
|---------------------|--|
| Basic | Basic constructs are of a generic nature that doctors should be able to perform at time of applying to surgical training (Table 2). These constructs combine only a few elementary skills. |
| Intermediate | Intermediate constructs are either: <ul style="list-style-type: none"> • Generic for pre-vocational doctors (Table 3) • Required by the specialty training boards for SET applicants (Table 4) |
| Advanced | Advanced constructs are those which Trainees may be expected to perform during early SET as defined by the individual specialty training boards.

<i>Some basic, intermediate and advanced constructs may be applicable to non-surgeon proceduralists.</i> |

Basic constructs

Table 2

Construct	Observe	Describe	Perform
Closure of a superficial wound	✓	✓	✓
Care of wound healing by secondary intention	✓	✓	✓
Removal of sutures and staples	✓	✓	✓
Removal of wound drain	✓	✓	✓
Excision of skin lesion	✓	✓	✓
Debridement of superficial contaminated wound	✓	✓	✓
Incision and drainage of sub cutaneous abscess	✓	✓	✓
Insertion of intercostal drain	✓	✓	✓
Placement of urethral catheter	✓	✓	✓
Placement of naso gastric tube	✓	✓	✓
Applying a plaster backslab splint	✓	✓	✓
Insertion of IV canula	✓	✓	✓
Pleural/peritoneal tap	✓	✓	✓
Removal of foreign body from eye, ear and nose	✓	✓	✓
Advanced life support	✓	✓	✓
Haemorrhage control - Superficial wound haemostasis	✓	✓	✓
Haemorrhage control - Epistaxis	✓	✓	✓

Intermediate constructs: *Generic for pre-vocational doctors*

Table 3

Construct	Observe	Describe	Perform
Emergency assessment and management plan of			
Post-operative bleed	✓	✓	✓
Miscarriage	✓	✓	✓
Abdominal sepsis	✓	✓	✓
Closed head injury	✓	✓	✓
Compartment syndrome	✓	✓	✓
Septic shock	✓	✓	✓
Trauma	✓	✓	✓
Acute limb ischaemia	✓	✓	✓
Acute abdomen	✓	✓	✓
Tendon injury	✓	✓	✓
Long bone fractures	✓	✓	✓
Burns	✓	✓	✓
GI bleeding	✓	✓	✓

Intermediate: Specialty requirements for SET applicants

Table 4

Construct	Observe	Describe	Perform
Entry level specialty specific			
Includes Level 2 Constructs Generic (<i>Table 3</i>)			
Paediatric Surgery			
Insertion of IV canula in children	✓	✓	✓
Maintenance of IV fluid management for infants and children	✓	✓	✓
IV fluid resuscitation for neonates and children	✓	✓	✓
Advanced Paediatric Life Support	✓	✓	✓
Appropriate prescribing of analgesia for a child	✓	✓	✓
Neurosurgery			
Care of closed head injury	✓	✓	✓
Clinical assessment of multi trauma patient	✓	✓	✓
Clinical neurological assessment	✓	✓	✓
Cranial operating room positioning	✓	✓	✓
Cranioplasty	✓	✓	
Craniotomy flaps	✓	✓	
Drilling bone dissections	✓	✓	
Drilling burr holes	✓	✓	✓
ICP monitoring	✓	✓	✓
Image guidance registration	✓	✓	✓
Lumbar puncture	✓	✓	✓
Management of potential spinal injury	✓	✓	✓
Operating microscope set up and use	✓	✓	✓
Post-operative bleed	✓	✓	
Spinal Operating room positioning	✓	✓	✓
Ultrasonic aspirator	✓	✓	✓
Ventriculostomy placement	✓	✓	✓
VP strut	✓	✓	
Cardiothoracic Surgery			
Exposure & Mobilisation of the Saphenous	✓	✓	✓
Chest Drain	✓	✓	✓
Harvesting of Radial Artery	✓	✓	
General Surgery			
Orthopaedic Surgery			
Recognises and initiates management of orthopaedic emergencies Open fractures Compartment syndrome Cauda equina syndrome Acute bone and joint infection/sepsis	✓	✓	✓
Recognises and diagnoses common orthopaedic presentations	✓	✓	✓
Common fracture classification application	✓	✓	✓
Principles of closed reduction of simple fractures and dislocations	✓	✓	
Application of common upper and lower limb plaster casts	✓	✓	✓
Draping for upper and lower limb orthopaedic procedures	✓	✓	✓
Principles and methods of fracture fixation	✓	✓	

Construct	Observe	Describe	Perform
Ordering equipment for uncomplicated primary hip and knee joint replacement surgery	✓	✓	✓
Supervised surgery for common upper and lower limb fractures Ankle fracture Neck of femur fracture Forearm fracture	✓	✓	✓
Reduction of Colles' wrist fracture	✓	✓	✓
Reduction of shoulder dislocation	✓	✓	✓
Post-operative care of common orthopaedic elective and trauma procedures	✓	✓	✓
Post-operative physiotherapy and rehabilitation after common orthopaedic elective and trauma procedures	✓	✓	
Venous thromboembolism prevention in orthopaedic conditions	✓	✓	
Otolaryngology Head and Neck Surgery			
Plastic and Reconstructive Surgery			
Urology			
Vascular Surgery			
Assessment of Acute limb ischaemia	✓	✓	✓
Investigation and management of patients with	✓	✓	✓
Pre-operative assessment, investigation	✓	✓	
Calculation of Ankle Brachial Index	✓	✓	✓
Care of angiographic puncture sites	✓	✓	✓

Advanced constructs (early SET)

As described by specialty training curriculum modules.

Section 3. Procedures for GP Proceduralists

Vocationally trained general practitioners may undertake training to develop the skills necessary to perform some surgical procedures.

The elementary surgical skills (Table 1) and some of the surgical constructs (Tables 2, 3 and 4) may be combined with the *Skills for GP Proceduralists* to form a range of tasks that doctors as a part of a surgical team could perform either independently or with varying degrees of supervision.

Skills for GP Proceduralists are sourced from the RACS Guidelines and Position Paper "[Training for GP Proceduralists](#)". Procedures are divided into three levels based on the level of training and resources required.

- Level 1** procedures that require minimal training (Table 5)
- Level 2** procedures that require higher level training (Table 6)
- Level 3** procedures that require at least one year of training with RACGP or ACRRM surgical proceduralist training programs and an ongoing mentoring relationship with a RACS Fellow (Table 7)

Level 1 procedures

Table 5

Construct	Observe	Describe	Perform
Excision of cutaneous lesions with simple closure	✓	✓	✓
Suture and repair of lacerations	✓	✓	✓
Removal of superficial palpable foreign bodies	✓	✓	✓
Removal of toenail	✓	✓	✓
Application of plaster for undisplaced fractures of the upper	✓	✓	✓
Incision and drainage of cutaneous abscesses	✓	✓	✓

Level 2 procedures

Table 6

Construct	Observe	Describe	Perform
Wedge excision of toenail bed	✓	✓	✓
Toenail ablation	✓	✓	✓
Cauterisation or freezing of skin lesions	✓	✓	✓
Incisional biopsy of skin lesions	✓	✓	✓
Clinical assessment of multi trauma patient	✓	✓	✓
Punch biopsy of skin lesions	✓	✓	✓
Closed reduction of fractures	✓	✓	✓
Neurosurgical			
Care of closed head injury	✓	✓	
Management of potential spinal injury	✓	✓	
Vascular - Diagnosis and non-operative management			
Arterial/venous ulcers	✓	✓	✓
Peripheral Vascular disease/ Claudication	✓	✓	✓
Superficial thrombophlebitis	✓	✓	✓
Calculation of Ankle Brachial Index	✓	✓	✓

Level 3 procedures

Table 7

Skin/subcutaneous tissue			
Elements	Observe	Describe	Perform
Excision and suture of complex wounds	✓	✓	✓
Drainage/debridement of infected or contaminated wound	✓	✓	✓
Drainage of deep abscess	✓	✓	✓
Drainage of haematomas	✓	✓	✓
Removal of deep foreign bodies	✓	✓	✓
Simple flap closure of wounds	✓	✓	✓
Skin grafts – Partial/ Full thickness	✓	✓	✓
Burns			
Dressings/diagnosis	✓	✓	✓
Escarotomy	✓	✓	✓
Criteria for referral	✓	✓	✓
Head and Neck			
Elements	Observe	Describe	Perform
Facial injuries (complex)			
Airway protection	✓	✓	✓
Suture lacerations	✓	✓	✓
Mandible stabilisation	✓	✓	✓
Cricothyroidotomy	✓	✓	✓
Open head injuries			
Suture --> transfer arrangements	✓	✓	✓
ENT Emergencies			
Epistaxis control	✓	✓	✓
Nasal packing	✓	✓	✓
Incision & drainage abscesses	✓	✓	✓
Deafness, ear infection			
Canal toilet	✓	✓	✓
Eye trauma			
Burns - major/minor	✓	✓	✓
Penetrating injuries – assessment and referral	✓	✓	✓
Lump in neck			
Diagnosis	✓	✓	✓
Breast			
Elements	Observe	Describe	Perform
Breast abscess/infection			
Drainage	✓	✓	✓
Breast lump			
Triple assessment and referral	✓	✓	✓

Chest			
Elements	Observe	Describe	Perform
Chest pain			
Diagnosis	✓	✓	✓
Chest trauma			
Closure open wounds	✓	✓	✓
Pneumothorax - chest tubes	✓	✓	✓
Pleural tap	✓	✓	✓
Pericardial aspirate - emergency	✓	✓	✓
Exposure & Mobilisation of the Saphenous Vein at the Ankle	✓	✓	✓
Chest Drain	✓	✓	✓
Harvesting of Radial Artery	✓	✓	
Abdomen			
Elements	Observe	Describe	Perform
Bowel obstruction, diagnosis-resuscitation	✓	✓	✓
Perforated viscus, diagnosis-resuscitation	✓	✓	✓
Abdominal trauma, diagnosis-resuscitation	✓	✓	✓
Abdominal mass, diagnosis	✓	✓	✓
Rigid / fibre optic sigmoidoscopy	✓	✓	✓
Acute GI bleeding Diagnosis-resuscitation	✓	✓	✓
Abdominal pain			
Diagnosis and management plan	✓	✓	✓
Appendicitis			
Diagnosis	✓	✓	✓
Appendicectomy	✓	✓	✓
Peri-anal			
Elements	Observe	Describe	Perform
Peri-anal/ischio-rectal abscess drainage	✓	✓	✓
Laying open pilonidal sinus	✓	✓	✓
Peri-anal haematoma (incision and drainage)	✓	✓	✓
Genitourinary			
Elements	Observe	Describe	Perform
Groin/scrotal lumps	✓	✓	✓
Testicular torsion	✓	✓	✓
Testicular trauma	✓	✓	✓
Vasectomy	✓	✓	✓
Circumcision	✓	✓	✓
Renal pain diagnosis	✓	✓	✓
Prostate disease diagnosis	✓	✓	✓
Urinary tract infection diagnosis/treatment	✓	✓	✓
Voiding difficulties			
Catheterisation	✓	✓	✓
Urethral dilatation	✓	✓	✓
Suprapubic catheter	✓	✓	✓
Gynaecology/Obstetric (diagnosis and management)			
Elements	Observe	Describe	Perform
Acute gynaecology conditions	✓	✓	✓
Obstetric emergency	✓	✓	✓
Ectopic pregnancy	✓	✓	✓

Vascular			
Elements	Observe	Describe	Perform
Acute Ischaemic limb Diagnosis and non-operative	✓	✓	✓
Compartment syndromes – Emergency Fasciotomy	✓	✓	✓
Arterial trauma - Haemorrhage control	✓	✓	✓
Ruptured abdominal aortic aneurysm - assessment and resuscitation	✓	✓	✓
Musculoskeletal			
Elements	Observe	Describe	Perform
Hand injuries			
Abscess drainage	✓	✓	✓
Tendon sheath drainage	✓	✓	✓
Terminalisation of digit	✓	✓	✓
Joint pain/injuries			
Intra-articular steroids	✓	✓	✓
Ligament injuries			
Diagnosis/splinting	✓	✓	✓
Limb fractures/dislocations			
Simple fracture management	✓	✓	✓
Relocation dislocations	✓	✓	✓
Nerve entrapment			
Carpel tunnel release	✓	✓	✓

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