Royal College of Anaesthetists

CCT in Anaesthetics

Annex E
Advanced Level Training

Edition 2 | August 2010 | Version 1.8

Table of Contents

Glossary of terms

ALI	Acute Lung Injury
ALS	Advanced Life Support
APACHE	Acute Physiology and Chronic Health Evaluation
APLS	Advanced Paediatric Life Support
ARDS	Acute Respiratory Distress Syndrome
ASA	American Society of Anesthesiologists
ASD	Atrial septal defect
AV	Aortic Valve
BE	Base excess
BIS	Bispectral index
BP	Blood pressure
BMI	Body mass index
BNF	British national formulary
CFAM	Cerebral function analysis monitor
CFM	Cerebral function monitor
CO_2	Carbon dioxide
COPD	Chronic Obstructive Pulmonary Disease
CPEX	Cardiopulmonary exercise testing
CSE	Combined Spinal Epidural
CSF	Cerebro spinal fluid
CSM	Committee on Safety of Medicines
CT	Computerised tomograms
CVP	Central venous pressure
ECG	Electrocardiogram
ECHO	Echocardiogram
EEG	Electroeucephalogram
EMG	Electromyogram
ENT	Ear, Nose and Throat
EPLS	European Paediatric Life Support
ERPC	Evacuation of Retained Products of Conception
GCS	Glasgow Coma Score
GMC	General Medical Council
Hb	Haemoglobin
IAC	Initial assessment of competence
IDD	Intrathecal drug delivery
IPPV	Intermittent positive pressure ventilation
IRMER	Ionisation Radiation (Medical Exposure) Regulations
IT	Information technology
IVRA	Intravenous Regional Anaesthesia
LiDCO™	Lithium indicator dilution cardiac output

MAC	Minimum alveolar concentration
MH	Malignant hyperpyrexia
MRI	Magnetic resonance imaging
NAI	Non-accidental Injury
NCEPOD	National Confidential Enquiry into Perioperative Deaths
NICE	National Institute for Health and Clinical Excellence
NO	Nitric oxide
NSAID	Non-steroid anti-inflammatory drug
ODM	Oesophageal Doppler Monitor
PCA	Patient Controlled Analgesia
PEA	Pulseless Electrical Activity
PFO	Patent foramen ovale
PiCCO	Pulse Contour Continuous Cardiac Output
PONV	Postoperative nausea and vomiting
POSSUM	Physiological and Operative Severity Score for the enUmeration of Mortality and Morbidity
PSI	Pounds per square inch
Ref	Reference
RS	Respiratory system
RSI	Rapid sequence induction
SIADH	Syndrome of Inappropriate Anti-Diuretic Hormone
SpO_2	Saturation of haemoglobin with oxygen
SVP	Saturated vapour pressure
TCI	Target Controlled Infusions
TOE	Transoesophageal Echo
VSD	Ventricular septal defect
WCC	White cell count

Assessment method decode	
A	Anaesthesia Clinical Evaluation Exercise [A-CEX]
C	Case Based Discussion [CBD]
D	Direct Observation of Procedural Skills [DOPS]
E	Examination
I	Intensive Care Medicine Clinical Evaluation Exercise [I-CEX]
L	Anaesthesia List Management Assessment Tool [ALMAT]
M	Multi-source Feedback [MSF]
S	Simulation
T	Acute Care Assessment Tool [ACAT]

Advanced training

Advanced training is the final preparation for independent practice and will normally occur in ST year 7; in some Schools flexibility is required to allow all trainees to complete their desired advanced units, such that some may commence during ST year 6. In exceptional circumstances, a School may apply to the Chair of the Training Committee for prospective approval for a trainee to undertake advanced training in ST year 5. When seeking prospective approval from the Chair of the Training Committee, the Regional Adviser and the Programme Director must detail in writing the reasons why a trainee should be permitted to complete advanced training at such an early stage. At the end of higher training the trainee will be competent in all aspects of anaesthesia practice to that level and will have experience of most procedures and techniques. Trainees will not however have mastery of specialised, uncommon and difficult clinical work as they will have had little opportunity to develop special skills in an area of practice. The indicative year of full time advanced training allows this to occur and has two aims:

- To develop mastery in specific special interest areas of practice
- To extend the non-clinical skills needed for consultant practice

Programmes for advanced training will be adapted for each individual trainee and will be agreed by the Training Programme Director. The following are the Advanced units that can be undertaken:

- *Anaesthesia for neurosurgery, neuroradiology and neurocritical care*
- *Cardiothoracic anaesthesia and cardiothoracic critical care*
- *General duties, which includes a mix of the following sub-units:*
  - *Airway management*
  - *Head, neck, maxillo-facial and dental surgery*
  - *General, urological and gynaecological surgery*
  - *Hepatobiliary surgery*
  - *Vascular*
  - *Day surgery*
  - *Sedation [and further advanced optional unit in sedation for dentistry]*
  - *Orthopaedic surgery*
  - *Regional*
  - *Trauma*
  - *Transfer medicine and emergency medical retrieval*
- *Intensive care medicine (See Annex F)*
- *Obstetrics*
- *Paediatrics*

- *Paediatric intensive care medicine*
- *Pain Medicine*
- *Plastics/Burns*

Full descriptions of the outcomes from each unit are clearly identified in their individual section below.
By this stage of training, the vast majority of outcomes are generic across all areas of clinical practice in anaesthesia, intensive care and pain medicine. Thus at this level they have been divided into six domains as follows:

Domain 1: Clinical Practice
Domain 2: Team working
Domain 3: Leadership
Domain 4: Innovation
Domain 5: Management
Domain 6: Education

The generic descriptors that are equally relevant to all advanced areas of practice are provided in each domain ***and importantly*** are not repeated in each unit, so trainees and trainers must refer back to these six domains as and when necessary. Following these six domains, each Advanced Level unit of clinical training is listed; this includes learning outcomes [which incorporate the generic outcomes], specific guidance for each unit and any advanced competencies specific to that area of clinical practice; frequently there are no additional descriptors as all those required have been identified in Higher Level training and it is the mastery of techniques, leadership, management, communication and teaching skills that need to be embedded in this advanced year.

Competence	*Description*	*Assessment methods*	*GMP*
	Domain 1: Clinical practice **Highly specific clinical competencies are not identified as each trainee's focus and career intention will be different and, in many cases, be dependent upon the availability of patients that present uncommon challenges; knowledge and skills are combined as this is most appropriate at the intended level of practice**		
AT_D1_01	Demonstrates mastery of all aspects of clinical care in all clinical situations regularly encountered in the chosen area of practice and shows clear understanding of: • Why effective decision making, communication, team-working and organisation skills are required by anaesthetists to ensure clinical sessions are delivered safely, efficiently and effectively to the benefit of both patients and the	L,M	1,2,3,4

	organisation; this implies an ability to recognise the importance of providing overall leadership of the multi-disciplinary team when necessary • How to utilise the time allocated to clinical sessions effectively for patient care, without compromising safety • The central role human factors plays in developing a culture of safe practice and how collaboration and team-working enhances safety		
AT_D1_02	Demonstrates and teaches safe behaviours in prescribing practice to all members of the multi-disciplinary team	A,C,L,M	1,2,3,4
AT_D1_03	Demonstrates and teaches how to obtain consent from patients in all situations showing compassion and understanding; this includes patients where there are difficulties with communication capacity	A,M	3,4
AT_D1_04	Demonstrates safe practice in clinical care in those *less common* clinical situations in the chosen area of practice where mastery has not yet been achieved	A,C,L,M	1,2,3,4
AT_D1_05	Shows mastery in some complex clinical situations when patients requiring difficult or dangerous interventions, providing advice to other team members and participating in the planning of complex procedures	A,C,L,M	1,2,3,4
AT_D1_06	Reflects on own clinical practice in order to achieve insight and: • Strives to correct deficiencies identified • Seeks learning opportunities and integrates new knowledge into clinical practice	M	-
AT_D1_07	Identifies opportunities to promote changes in lifestyle and other actions which will improve health and/or disease outcomes positively	M	1,2,3
AT_D1_08	Provides appropriate advice to others regarding the proper management of clinical problems	M	1,2,3,4
AT_D1_09	Shows the necessary maturity to guide the choice of audit cycles/quality improvement projects in developing practice	M	1,2
AT_D1_10	Promptly acknowledges mistakes and mishaps and demonstrates the ability to lead in managing errors including: • Talking to patients about untoward events, apologising appropriately, providing clear explanations acting with integrity and offering the necessary support • Leading de-briefs with all the staff involved • Implementing procedures to effect a full investigation • Openness and honesty at all times • The ability to learn from the errors and lead safety improvements to minimise likely recurrence	M	2,3,4
Domain 2: Team Working **Trainees are expected to demonstrate the necessary team working, management and leadership skills required post-CCT for independent practice**			

AT_D2_01	Participates in [and leads when appropriate] the organisation of complex interventions, including liaison with clinicians, nurses, clinical support specialties and managers	M	1,2,3,4
AT_D2_02	Demonstrates an ability to engage all members of the team, when required, to enable the session time to be used efficiently and effectively for the benefit of both the patients and the organisation; this implies an ability to lead the discussions in a timely and effective manner where/when necessary	L,M	3
AT_D2_03	Recognises own limitations and actively seeks the advice of others when needed	M	1,2
AT_D2_04	Commits to the principle that the patient and their relatives are often equal members of the clinical team	M	3,4
AT_D2_05	Demonstrates leadership in engaging other healthcare professional and support workers positively and: • Gives weight to contributions of others • Respects team decisions and is moderate in word and manner when necessarily registering their dissent • Understands that other team members may be experiencing strong emotions which must be recognised	M	2,3,4
AT_D2_06	Always shows appropriate understanding and control of their emotions when working with others	M	3
AT_D2_07	Understands the particular ways of working of the highly specialised teams in which they contribute	M	1,2,3,4
AT_D2_08	Teaches others how to work properly in teams	M	3
AT_D2_09	Demonstrates a desire to achieve high standards and monitors compliance to standards by the whole team	M	1,2,3
AT_D2_10	Demonstrates the importance of maintaining high levels of individual and team situation awareness at all times; asks for, or shares, information and anticipates future problems to maximise safe practice	M	2,3
AT_D2_11	Adopts strategies to reduce risk [e.g. the use of the WHO Safe Surgery Checklist] and a willingness to participate in improvement strategies [e.g. critical incident reporting]; acts to rectify error immediately if it is made	L,M	2,3
AT_D2_12	Demonstrates openness when talking to patients about untoward events, apologising appropriately, providing clear explanations, acting with integrity and offering the necessary support	M	3,4
AT_D2_13	Shows ability to learn from errors and shares that learning with the rest of the organisation	M	2,3
Domain 3: Leadership			
AT_D3_01	Understands that the role of the consultant involves demonstrating leadership in clinical management, service delivery and forward planning	M	2,3
AT_D3_02	Is aware of their position as an important positive role-model for others	M	3
AT_D3_03	Demonstrates commitment to the highest clinical standards personally and encourages others to achieve the best	M	1,2,3,4

AT_D3_04	Shows flexibility in accommodating the needs and work patterns of others and a preparedness to work flexibly in order to allow cover of unpredictable duties [e.g. the unavoidable absence of a colleague] to maintain essential clinical care to patients	M	1,2,3
AT_D3_05	Able to take the lead where appropriate in dealing with difficulties that have arisen in the clinical care of patients including communicating bad news, participating in clinical review and liaising with managers and dealing with complaints	A,C,M	1,2,3,4
AT_D3_06	Creates opportunities to bring colleagues together to further clinical and institutional goals including reducing unnecessary resource usage [environmental and financial] in all healthcare	M	1,2
AT_D3_07	Demonstrates the ability to communicate clearly, promptly and effectively with colleagues by means appropriate to the urgency of the situation [e.g. personal presence, telephone, email, letter etc] and recognising its crucial importance when transferring responsibility for patient care [e.g. at handovers]	M	3
AT_D3_08	Analyses information about performance from a wide range of resources; participates in [and if appropriate initiates and leads] initiatives to improve performance	M	1,2,3
Domain 4: Innovation			
AT_D4_01	Demonstrates understanding of the need to be aware of new trends and developments and; • Questions the status quo • Actively looks for ways to improve clinical practice and the patient experience • Commits to the changing roles and responsibilities of healthcare groups as practice develops • Is receptive to the attempts of others to improve practice • Urges responsible individuals and groups to seek and implement beneficial change	M	1,2,3
AT_D4_02	Understands the importance of research [clinical and laboratory] in the development of clinical practice in their chosen area[s], is aware of current areas of research and achieves competence in understanding, and explaining, the methodology and statistics involved	M	1,3,4
Domain 5: Management			
AT_D5_01	Commits to the objectives of their team, of their hospital and to the national planning of healthcare	M	1,2,3,4
AT_D5_02	Plans their work efficiently so that they can accomplish the targets they have set themselves and meet institutional objectives	M	1,2,3
AT_D5_03	Understands the central role of the patient and the public in determining directions and priorities in service development	M	1,3,4
AT_D5_04	Takes the initiative in: • Demonstrating the efficient use of resources and encouraging others to do the same • Identifying and reporting any significant deficiency of resources • Contributing to discussions and planning for service and facilities development	M	1,2,3

Domain 6: Education			
AT_D6_01	Continuously seeks to improve and update their knowledge and skills, using a variety of strategies, whilst keeping records of learning that are planned and undertaken, reflecting on their outcomes	M	1,2
AT_D6_02	Develops a personal learning network of individuals and organisations including; attending specialist educational meetings and reads specialist journals in special interest areas of practice	M	1,2
AT_D6_03	Is able to receive feedback appropriately for the purpose of self-improvement and provides feedback to others when asked	M	2,3
AT_D6_04	Commits to the supremacy of patient safety issues in providing an appropriate level of clinical or educational supervision	M	2,3
AT_D6_05	Actively participates in the planning and delivery of departmental teaching and training	M	1,2,3
AT_D6_06	Understands the roles and responsibilities of Clinical and Educational Supervisors; this includes: • Understanding the assessment strategy employed by the RCoA • Committing to the importance of assessing and evaluating learning • Understanding the importance of providing timely, specific, non-judgemental and developmental feedback and is able to do so effectively • Understanding the role of and appropriate conduct of the workplace-based assessments and is able to perform accurately and reliably • Knowing how to raise concerns about a poorly performing trainee • Understanding the responsibilities of clinical trainers as defined by relevant national organisations and regulators	M	1,2,3,4
AT_D6_07	Understands the roles and responsibilities of educational agencies involved in educational commissioning and governance, GMC, DoH, Deaneries Colleges and NHS Education commissioners	M	1,2,3,4

Anaesthesia for neurosurgery, neuroradiology and neuro critical care

Advanced training in anaesthesia for neurosurgery, neuroradiology and neuro-critical care should be delivered in a designated specialist centre undertaking a wide variety of complex elective and emergency neurosurgical/neuroradiological procedures, with the necessary associated neuro-critical care facilities and training must include all these aspects of practice. Trainees are expected to spend between six and twelve months undertaking this unit. Trainees are encouraged to gain experience in more than one such centre if at all possible.

Learning outcomes:

- Gain mastery in the delivery of safe and effective perioperative anaesthetic care to patients undergoing complex neurosurgical and neuroradiological procedures
- Gain mastery in the management of such cases and in doing so demonstrating the necessary multi-disciplinary leadership, communication and team-working skills necessary to ensure the care delivered benefits both the patient and the organisation
- Gain mastery in providing clinical input and leadership where required in neurological post-operative care units [including high dependency units]
- Gain maturity in understanding the importance of utilising the time allocated to clinical sessions effectively, optimising throughput whilst not compromising patient safety
- Gains the necessary maturity to guide the choice of audit cycles/quality improvement projects in developing practice
- Becomes familiar with recent developments in perioperative anaesthetic care to this area of practice, to evaluate these developments and to advise colleagues of useful changes in practice

For consultant posts in anaesthesia for neurosurgery and neuroradiology, core clinical learning outcomes are:

- To be capable of undertaking the perioperative anaesthetic care for a wide variety of complex neurosurgical and neuroradiological procedures independently; this implies an ability to:
  - Provide perioperative anaesthetic care to a wide-range of such cases demonstrating a fundamental understanding of the problems encountered
  - Show the decision making and organizational skills required of an anaesthetist to manage busy neurosurgery/neuroradiology sessions ensuring that the care delivered to patients is safe and timely, benefiting both the patient and the organisation
  - Provide clinical input and leadership where required in neurological post-operative care units [including high dependency units]
  - Assist colleagues in decisions about the suitability of surgery in difficult situations
  - Provide teaching to less experienced colleagues of all grades

For consultant posts with a commitment to both neurosurgical/neuroradiological anaesthesia and critical care, core clinical learning outcomes are:

- All identified above and in addition:

- Provide clinical leadership to a wide variety of patients requiring neuro critical care
- Provide management and leadership in using the facilities available to best effect

It is recommended that this requires three months of neuro critical care training and should form part of twelve months Step 2 training in intensive care medicine leading to a joint CCT in anaesthesia/intensive care medicine. In such situations, trainees must discuss their specific training requirements with their TPD [including the TPD for ICM if necessary] early, to ensure that they can fit the recommended training into their CCT programme in the requisite time, whilst also ensuring that a balanced programme of training is completed, as required for RCoA recommendation to the GMC for a CCT. Such programmes will need early discussions with the Chair of the Training Committee [or Deputy], contacted via the RCoA Training Department; this is also a ready source of advice to both trainees and trainers.

For consultant posts with commitment only to neuro-critical care minimum clinical learning outcomes:

- All identified above and in addition:
  - To have a thorough understanding of the complexity of the breadth of neurosurgery/neuroradiology performed and provide clinical leadership to any patient requiring neuro-critical care
  - Provide *management and leadership in using the facilities available to best effect*

It is recommended that training for such posts should include a minimum of 6 months higher/advanced training in anaesthesia for neurosurgery/neuroradiology and Step 2 training in intensive care medicine [including 3 months of neuro-critical care] leading to a joint CCT in anaesthesia/intensive care.

For trainees looking to a post with a major/exclusive interest in paediatric neuro surgery an individual advanced training programme will need to be prospectively agreed and early discussions with the RCoA Training Department and Chair of the Training Committee will be essential.

There are no specific additional knowledge and skills for this unit of training

Cardiothoracic anaesthesia and cardiothoracic critical care

Advanced training in anaesthesia for cardiothoracic surgery, cardiological procedures and cardiac critical care should be delivered in a designated specialist centre undertaking a wide variety of complex elective and emergency cardiac and thoracic procedures, with the necessary associated cardiac-critical care facilities. Trainees are encouraged to gain experience in more than one such centre if at all possible within the twelve month period, which should include aspects of cardiothoracic critical care.

Learning outcomes:

- Gain mastery in the delivery of safe and effective perioperative anaesthetic care to patients undergoing complex cardiothoracic surgical and cardiological procedures
- Gain mastery in the management of such cases and in doing so demonstrating the necessary multi-disciplinary leadership, communication and team-working skills necessary to ensure the care delivered benefits both the patient and the organisation
- Gain maturity in understanding the importance of utilising the time allocated to clinical sessions effectively, optimising throughput whilst not compromising patient safety
- Gains the necessary maturity to guide the choice of audit cycles/quality improvement projects in developing practice
- Becomes familiar with recent developments in perioperative anaesthetic care to this area of practice, to evaluate these developments and to advise colleagues of useful changes in practice

For consultant posts in anaesthesia for cardiac and thoracic surgery, core clinical learning outcomes are:

- To be capable of undertaking the perioperative anaesthetic care for a wide variety of complex cardiothoracic surgical cases and cardiological procedures independently; this implies an ability to:
  - Provide perioperative anaesthetic care to a wide-range of such cases demonstrating a fundamental understanding of the problems encountered
  - Show the decision making and organizational skills required of an anaesthetist to manage busy cardiothoracic operating sessions ensuring that the care delivered to patients is safe and timely, benefiting both the patient and the organisation
  - Assist colleagues in decisions about the suitability of surgery in difficult situations
  - Provide teaching to less experienced colleagues of all grades

For consultant posts with a commitment to both cardiothoracic anaesthesia and critical care, core clinical learning outcomes are:

- All identified above and, in addition, provide clinical leadership to a wide variety of patients requiring cardiothoracic critical care; management and leadership in using the facilities available to best effect. [It is recommended that this requires three months of cardiac critical care training and should form part of twelve months Step 2 training in intensive care medicine leading to a joint CCT in anaesthesia/intensive care medicine]. In such situations, trainees must discuss their

specific training requirements with their TPD [including the TPD for ICM if necessary] early, to ensure that they can fit the recommended training into their CCT programme in the requisite time, whilst also ensuring that a balanced programme of training is completed, as required for RCoA recommendation to the GMC for a CCT. Such programmes will need early discussions with the Chair of the Training Committee [or Deputy], contacted via the RCoA Training Department; this is also a ready source of advice to both trainees and trainers.

For trainees looking to a post with a major/exclusive interest in paediatric cardiac surgery an individual advanced training programme will need to be prospectively agreed and early discussions with the RCoA Training Department and Chair of the Training Committee will be essential.

Specific Advanced Cardio-thoracic Knowledge			
Competence	*Description*	*Assessment methods*	*GMP*
CT_AK_01	Can discuss in depth: • The place of perfusion techniques in current cardiac surgical practice • The role of assist devices and ECMO in the perioperative care of the cardiac surgical patient • The principles and indications for Echocardiographic examinations [Oesophageal/Trans thoracic] in the perioperative care of the cardiac patient, exhibiting a level of knowledge commensurate with that required to pass a recognised examination in echocardiography • The specific issues surrounding the perioperative anaesthetic care of the patient with Grown Up Congenital Heart Disease [GUCH] • The principles of anaesthesia for paediatric cardiac surgery • How new practices can be implemented within the NSF for cardiac disease	A,C	1,2

Specific Advanced Cardio-thoracic Skills			
Competence	*Description*	*Assessment methods*	*GMP*
CT_AS_01	Demonstrates advanced skills in image acquisition and interpretation for perioperative trans-oesophageal echocardiography and basic transthoracic echocardiography skills, to a level matching that of assessment by examination	A,C,D	1,2

General duties

There are twelve units that form the broad Advanced Level general duties 'block'. It is anticipated that most trainees will wish to spend twelve months completing the minimum learning outcomes in several of the units of training identified within this broad 'block'. The College recognises that some trainees may wish to combine six months of one of the other identified Advanced Level units [e.g. obstetrics or plastics and burns], with six months completing some units from within general duties. Any such combinations are encouraged to allow trainees as much flexibility as possible, whilst taking account of the needs of the NHS.

Trainees opting for twelve months of Advanced Level general duties are expected to choose a selection of the units available, as it will be impossible to have gained all the advanced learning outcomes in an indicative twelve month period. Trainees will however, be expected to complete a minimum of two of the units and it is anticipated that the vast majority will complete more than this as many have overlapping competencies [e.g. airway management and ENT, maxillo-facial and dental; orthopaedics and regional anaesthesia; general urological and gynaecological surgery and hepatobiliary]. Elderly patients form an increasing part of anaesthetic caseload across all specialist areas, and emphasis on their care and attendant problems should feature in many subunits of general duties.

The exact number of units completed satisfactorily may depend on a number of factors including: the availability of advanced units in a particular School; the competing needs of individual trainees [this must be dealt with at a School level by the TPD in conjunction with local trainers, College Tutors and the RA]; the trainees clinical abilities [those with excellent abilities in all areas of practice may be able to achieve the learning outcomes in more units than other trainees]. The exact combination, and number, of units each trainee decides to include in their chosen year should be made following discussions with the TPD, RA, College Tutors and Educational Supervisors.

The eleven units that make up the advanced general duties unit are:

- *Airway management*
- *Head and neck, maxillo-facial and dental surgery*
- *General, urological and gynaecological surgery*
- *Hepato-biliary surgery*
- *Vascular surgery*
- *Day surgery*
- *Sedation*
- *Orthopaedic surgery*
- *Regional*
- *Trauma and stabilisation*
- *Transfer medicine*

Airway management

Advanced training in airway management should be delivered in centres undertaking a wide variety of complex elective and emergency surgical cases presenting specific airway problems. It is expected that between three and six months will need to be spent acquiring all the competencies/leaning outcomes in this advanced unit of training [many of which could be obtained in conjunction with the ENT, maxillo-facial and dental surgery advanced unit.]

Learning outcomes:

- Gain mastery in the delivery of safe and effective peri-operative airway and anaesthetic care to patients with complex airway problems involving all types of surgery and in doing so demonstrating the necessary multi-disciplinary leadership, communication and team-working skills necessary to ensure the care delivered benefits both the patient and the organisation
- Demonstrates mastery in the safe use of fibreoptic intubation in all situations
- Gain mastery in all aspects of airway management including in-depth knowledge and experience of novel airway devices; be familiar with recent developments in perioperative anaesthetic care to this area of practice, evaluate these developments and advise colleagues of useful changes in practice
- Gains the necessary maturity to guide the choice of audit/quality improvement projects cycles in developing practice

Core clinical learning outcomes*:*

- To be capable of undertaking the perioperative airway and anaesthetic care for a wide variety of patients with complex airway problems independently; this implies an ability to:
  - Perform fibreoptic intubation in all clinical situations where it is an essential part of safe airway care
  - Show the decision making and organizational skills required of an anaesthetist to manage busy operating sessions that involve patients having major airway surgery and ensuring that the care delivered is safe and timely, benefiting both the patient and the organisation
  - To assist colleagues in decisions about the suitability of surgery in difficult situations
  - Provide teaching to less experienced colleagues of all grades

Knowledge			
Competence	*Description*	*Assessment Methods*	*GMP*
AM_AK_01	Shows in-depth knowledge about all issues related to the management of difficult airways, including the use of novel airway techniques	A,C	1,2
Skills			

Competence	*Description*	*Assessment Methods*	*GMP*
AM_AS_01	Demonstrates mastery in performing fibreoptic intubation, awake and asleep, for elective and emergency cases including for those with major airway pathology	A,D	1,2,3,4
AM_AS_02	Demonstrates expertise in the management of difficult paediatric airways that may present in any non-specialist hospital	A,D	1,2,3

Head, neck, maxillo-facial and dental surgery

Advanced training in anaesthesia for ENT, maxillo-facial and dental surgery should be delivered in centres undertaking a wide variety of complex elective and emergency surgical cases in these areas. It is expected that between three and six months will need to be spent acquiring all the competencies/leaning outcomes in this advanced unit of training [many of which are common to many other advanced level units, particularly Airway Management and reconstructive surgery].

Learning outcomes:

- Gain mastery in the delivery of safe and effective perioperative anaesthetic care to patients undergoing complex/major ENT, maxillo-facial and dental surgery including those requiring sternotomy for thoracic extension and major free-flap reconstruction
- Gain mastery in the management of major ENT, maxillo-facial and dental surgical lists and in doing so demonstrating the necessary multi-disciplinary leadership, communication and team-working skills necessary to ensure the care delivered benefits both the patient and the organisation
- Gain maturity in understanding the importance of utilising the time allocated to clinical sessions effectively, optimising throughput whilst not compromising patient safety
- Gains the necessary maturity to guide the choice of audit cycles/quality improvement projects in developing practice
- Becomes familiar with recent developments in perioperative anaesthetic care to this area of practice, to evaluate these developments and to advise colleagues of useful changes in practice

Core clinical learning outcomes*:*

- To be capable of undertaking the perioperative anaesthetic care for a wide variety of complex ENT, maxillo-facial and dental surgical cases independently; this implies an ability to:
  - Provide perioperative anaesthetic care to a wide-range of surgical cases performed [including those with thoracic extension, complex tumour resection and associated reconstruction [+/- free-flap], frequently requiring the ability to manage extremely complex airway problems], demonstrating a fundamental understanding of the problems encountered
  - Show the decision making and organizational skills required of an anaesthetist to manage busy operating sessions that involve patients having major ENT, maxillo-facial and dental surgery and ensuring that the care delivered is safe and timely, benefiting both patients and the organisation
  - To assist colleagues in decisions about the suitability of surgery in difficult situations
  - Provide teaching to less experienced colleagues of all grades

Knowledge

Competence	*Description*	*Assessment Methods*	*GMP*
EN_AK_01	Knowledge of paediatric syndromes associated with the need for anaesthesia for maxillo facial surgery [Ref Paeds]	A,C	1
EN_AK_02	Describes the range of procedures performed on infants and neonates [Ref Paeds]	A,C	1

General surgery, urological and gynaecological surgery

Advanced training in anaesthesia for general, urological and gynaecological surgery should be delivered in centres undertaking a wide variety of complex elective and emergency surgical cases in these areas. It is recommended that between three and six months is spent on this dedicated advanced unit of training.

Learning outcomes:

- Gain mastery in the delivery of safe and effective perioperative anaesthetic care to patients undergoing complex intra-abdominal surgical procedures including those where pleural breach is anticipated
- Gain mastery in the management of major abdominal surgical and in doing so demonstrating the necessary multi-disciplinary leadership, communication and team-working skills necessary to ensure the care delivered benefits both the patient and the organisation
- Gain maturity in understanding the importance of utilising the time allocated to clinical sessions effectively, optimising throughput whilst not compromising patient safety
- Gains the necessary maturity to guide the choice of audit cycles/quality improvement projects in developing practice
- Becomes familiar with recent developments in perioperative anaesthetic care to this area of practice, to evaluate these developments and to advise colleagues of useful changes in practice

Core clinical learning outcomes*:*

- ***To be capable of undertaking the perioperative anaesthetic care for a wide variety of complex abdominal surgical cases independently; this implies an ability to:***
  - Provide perioperative anaesthetic care to a wide-range of surgical cases performed [including those where pleural breach may occur], demonstrating a fundamental understanding of the problems encountered
  - Show the decision making and organizational skills required of an anaesthetist to manage busy operating sessions that involve patients having major abdominal surgery and ensuring that the care delivered is safe and timely, benefiting both the patient and the organisation
  - Assist colleagues in decisions about the suitability of surgery in difficult situations
  - Provide teaching to less experienced colleagues of all grades

There are no specific Knowledge and Skills related to this advanced unit of training

Hepatobiliary surgery

This optional advanced unit of training is unlikely to be available in all Schools of Anaesthesia, due to the limited numbers of centres undertaking this type of surgery; as a result, some trainees who wish to gain such training may need to seek an inter-School secondment or OOPT. It is expected that this unit will often be undertaken in conjunction with, or as a follow-on from, the general, urological and gynaecological advanced unit and, as such it is recommended that the indicative time for this dedicated optional advanced unit of training is six months.

Learning outcome:

- Gain mastery in the delivery of safe and effective peri-operative anaesthetic care to patients undergoing complex hepatobiliary surgical procedures
- Gain mastery in the management of major hepatobiliary surgical and in doing so demonstrating the necessary multi-disciplinary leadership, communication and team-working skills necessary to ensure the care delivered benefits both the patient and the organisation
- Gain maturity in understanding the importance of utilising the time allocated to clinical sessions effectively, optimising throughput whilst not compromising patient safety
- Gains the necessary maturity to guide the choice of audit cycles/quality improvement projects in developing practice
- Becomes familiar with recent developments in perioperative anaesthetic care to this area of practice, to evaluate these developments and to advise colleagues of useful changes in practice

Core clinical learning outcomes*:*

- To be capable of undertaking the perioperative anaesthetic care for a wide variety of complex hepatobiliary surgical cases independently; this implies an ability to:
  - Provide perioperative anaesthetic care to a wide-range of surgical cases performed, demonstrating a fundamental understanding of the problems encountered
  - Show the decision making and organizational skills required of an anaesthetist to manage busy operating sessions that involve patients having major hepatobiliary surgery and ensuring that the care delivered is safe and timely, benefiting both the patient and the organisation
  - Assist colleagues in decisions about the suitability of surgery in difficult situations
  - Provide teaching to less experienced colleagues of all grades

Knowledge

Competence	*Description*	*Assessment methods*	*GMP*
HB_AK_01	Can discuss in depth the roles of point of care testing and intra-operative haemodynamic monitoring in patients undergoing hepatobiliary surgery including liver transplantation	A,C	1,2
HB_AK_02	Can discuss the specific issues for recipients of cadaveric and live-related liver transplantation, including [but not exclusively]: • Indications for transplantation • Risk assessment, both generic [related to co-morbid illness and general health] and specific [e.g. using risk stratification methodology such as Model for End-stage Liver Disease [MELD] and Child-Turcotte-Pugh scores] • Understanding of the roles of members of donor-transplant teams and a multidisciplinary approach to transplantation • The ethical and clinical implications of non-heart beating liver donation for the recipient • The management of patients undergoing live-related liver donation • Understanding of immunosuppression and other pharmacological therapy in the peri-operative and ongoing management of patients undergoing liver transplantation	A,C	1,2

Vascular

Advanced training in anaesthesia for vascular surgery should be delivered in centres undertaking a wide variety of complex elective and emergency surgical cases in this area. It is expected that between three and six months will need to be spent acquiring all the competencies/leaning outcomes in this advanced unit of training, which should include time providing peri-operative anaesthetic care for patients undergoing minimally invasive management of their vascular pathology. It may or may not be a dedicated unit.

Learning outcomes:

- Gain mastery in the delivery of safe and effective perioperative anaesthetic care to patients undergoing complex vascular procedures [including intra-thoracic], both elective and emergency and in-theatre and in imaging suites
- Gain mastery in the management of such major cases demonstrating the necessary multi-disciplinary leadership, communication and team-working skills necessary to ensure the care delivered benefits both the patient and the organisation
- Gain maturity in understanding the importance of utilising the time allocated to clinical sessions effectively, optimising throughput whilst not compromising patient safety
- Gains the necessary maturity to guide the choice of audit cycles/quality improvement projects in developing practice
- Becomes familiar with recent developments in perioperative anaesthetic care to this area of practice, to evaluate these developments and to advise colleagues of useful changes in practice

Core clinical learning outcomes*:*

- To be capable of undertaking the perioperative anaesthetic care for a wide variety of complex vascular cases independently; this implies an ability to:
  - Provide perioperative anaesthetic care to a wide range of cases in and out of theatre [including those where supra renal or thoracic aortic cross clamping occurs], demonstrating a fundamental understanding of the problems encountered
  - Show the decision making and organizational skills required of an anaesthetist to manage busy clinical sessions that involve patients having major vascular procedures, ensuring that the care delivered is safe and timely, benefiting both the patient and the organisation
  - To assist colleagues in decisions about the suitability of surgery in difficult situations
  - Provide teaching to less experienced colleagues of all grades

Knowledge

Competence	*Description*	*Assessment methods*	*GMP*
VS_AK_01	In-depth understanding of the use of functional monitors during carotid artery surgery	A,C	1
VS_AK_02	In-depth understanding of the perioperative anaesthetic management of all vascular surgical cases, including those requiring thoracic access/pleural breach	A,C	1

Skills			
Competence	*Description*	*Assessment methods*	*GMP*
VS_AS_01	Demonstrates safe perioperative anaesthetic care of patients having combined surgical / radiological procedures, including those performed in isolated sites using either regional or general anaesthesia	A,,D,M	1,2,3,4
VS_AS_02	Demonstrates skills necessary to provide safe anaesthetic care to patients requiring major vascular surgery that includes thoracic access/pleural breach	A,D	1,2,3,4
VS_AS_03	Demonstrates the ability to perform either general or regional anaesthesia safely and effectively for carotid artery surgery	A,D	1,2,3,4
VS_AS_04	Demonstrates the ability to perform safe and effective regional anaesthesia for vascular surgery including placement and management of thoracic and lumbar epidural, spinal and combined spinal/epidural	A,D	1,2,3,4

Day surgery

Advanced training in anaesthesia for day surgery should be delivered in centres with a dedicated day surgical unit with a designated director/lead clinician who has sessional commitment to the role. The unit should have a workload from a wide range of specialities and should have an established pre-assessment service. It is recommended that between three and six months are spent on this advanced unit of training. Whilst mastery in clinical skills will be achieved, much of the benefit gained from this unit of training will be in developing leadership and management skills related to the organisation of a day surgery unit, in conjunction with all other members of the multi-disciplinary team.

Learning outcomes:

- Gain mastery in all aspects of the perioperative anaesthetic management of all patients presenting for day surgery
- Gain mastery in all aspects of the organisational and managerial aspects of leading a day surgical unit multidisciplinary team
- Gains maturity in understanding the importance of utilising the time allocated to clinical sessions, optimising throughput whilst not compromising safety
- Gains the necessary maturity to guide the choice of audit cycles/quality improvement projects in developing practice in day case perioperative anaesthetic management
- Becomes familiar with recent developments in peri-operative anaesthetic care to this area of practice, to evaluate these developments and to advise colleagues of useful changes in practice

Core clinical learning outcomes:

- To be capable of undertaking the perioperative management of a wide range of patients for day case procedures including those with co-morbidities independently
- Show the decision making and organizational skills required of an anaesthetist to manage a busy day surgery session ensuring that the care delivered is safe and timely, benefiting both the patient and the organisation
- Show the organisational and team working skills to lead and manage a day surgery unit in conjunction with the other members of the multi-disciplinary team
- Assist colleagues in decisions about the suitability of surgery in difficult situations
- Provide teaching to less experienced colleagues of all grades

Knowledge			
Competence	*Description*	*Assessment Methods*	*GMP*
DS_AK_01	Demonstrates a comprehensive and mature understanding of the role of Unit Director/Lead Clinician in the leadership of a dedicated day surgical unit & multidisciplinary team	A,C,M	1,2,3,4

Knowledge			
Competence	*Description*	*Assessment Methods*	*GMP*
DS_AK_02	Understands the processes required to develop safe and effective day case management & patient selection protocols	A,C,M	1,2,3,4

Skills			
Competence	*Description*	*Assessment Methods*	*GMP*
DS_AS_01	Demonstrates mastery in the assessment and decision making of fitness for complex day surgical cases, particularly those with patients with significant co-morbidities	A,C,D,M	1,2,3,4

Sedation

This unit of training is key for many anaesthetists practicing post-CCT, whatever their final special interest area may be, as the safe and effective delivery of conscious sedation is a generic skill required of all anaesthetists as its use is becoming increasingly common and is frequently administered in remote sites [see Section 6.2 for further information on remote site working]. It is also essential that there is effective teaching, supervision and assessment of this area of practice. It is expected that the advanced competencies/learning outcomes will be obtained over the course of higher/advanced training, rather than as a block and it cross references to many of the Advanced Level units.

Learning outcomes:

- Gain mastery in the delivery of safe and effective peri-procedural conscious sedation to patients of all ASA grades [frequently with serious co-morbidities] undergoing a wide variety of simple to complex procedures often in remote areas
- Gains the necessary maturity to guide the choice of audit cycles/quality improvement projects in developing practice
- Becomes familiar with recent developments in peri-procedural conscious sedation and to evaluate these

Core clinical learning outcomes:

- To be capable of delivering safe and effective peri-procedural conscious sedation to patients requiring a wide variety of complex investigative/treatment procedures independently; this implies an ability to:
  - Provide safe and effective sedation using a wide variety of techniques to best effect for patients and the organisation, demonstrating a fundamental understanding of the problems encountered
  - Show the decision making and organizational skills required of an anaesthetist to manage patients requiring sedation in remote locations
  - To assist colleagues in decisions about the suitability of [frequently] invasive investigative/treatment procedures in difficult situations
  - Provide teaching to less experienced colleagues of all grades

Conscious sedation in dentistry [optional additional unit]

This optional unit of training should only be undertaken once the advanced unit of conscious sedation has been completed. It is anticipated that not all Schools of Anaesthesia will be able to deliver this unit of training, as there are a limited number of trainers proficient in delivering the necessary supervision and training.

Learning Outcomes:

- Gain mastery in this special interest area of practice by building on all the principles, knowledge and skills learnt and developed in the advanced CS unit of training

- To develop the necessary skills and knowledge to use conscious sedation techniques for dentistry appropriately in the hospital and non-hospital setting
- To understand the spectrum of behavioural and pharmacological techniques of pain and anxiety control for dentistry as an adjunct to local anaesthesia
- To understand the limitations of working in the isolation of the non-hospital environment

Knowledge for conscious sedation in dentistry			
Competence	*Description*	*Assessment Methods*	*GMP*
CD_AK_01	Discusses the importance of published guidance for the use of conscious sedation in dentistry	A,C	1,2,3,4
CD_AK_02	Discusses the causes of dental pain and describes the mechanisms of pain transmission in the oro-facial region	A,C	1
CD_AK_03	Discusses the use of local anaesthesia for dentistry and describes techniques and complications	A,C	1,2
CD_AK_04	Explains the complexity of treatment need and how this may influence clinical management		2
CD_AK_05	Describes the definition and development of dental anxiety and phobia	A,C	1,2,3
CD_AK_06	Explains the importance of being able to recognise the signs and symptoms of dental anxiety and describes the assessment of its severity [e.g. Modified Dental Anxiety Score [MDAS]]	A,C	1,2
CD_AK_07	Outlines the role of behavioural strategies for management of dental anxiety including, but not exclusively: • Communication including the use of appropriate language • Positive reinforcement • Distraction and the environment • Desensitisation and tell/show/do • Modelling techniques • Cognitive behavioural therapy [CBT]	A,C	1,2,3,4
CD_AK_08	Explains the role of pharmacological techniques in the spectrum of pain and anxiety control for dentistry as an adjunct to and not a substitute for effective local anaesthesia and good behavioural management	A,C	1,2
CD_AK_09	Discusses the range of standard and alternative sedation techniques available for out-patient dental practice as defined in published guidance, the different routes of administration and their role in the management of the anxious patient	A,C	1,2,3
CD_AK_10	Explains the importance of thorough preoperative preparation of dental out-patients, the consent process and aftercare, focusing on medical, social and psychological assessment and evaluation of risk	A,C	1,2,3,4
CD_AK_11	Discusses the place of intravenous infusions and TCI for conscious sedation in out-patient dental practice	A,C	1,2
CD_AK_12	Discusses the limitations imposed by working in the isolation of the non-hospital environment including: • The need to ensure that each component of the premises [e.g. waiting room, surgery, recovery area] is appropriate to	A,C	1,2,3,4

Knowledge for conscious sedation in dentistry			
Competence	*Description*	*Assessment Methods*	*GMP*
	the sedation technique[s] used • The importance of robust patient selection including, but not exclusively: dental, psychological, medical and social assessment, and that it be undertaken in advance of actual treatment and include a valid consent process • Awareness that staff and equipment available must meet the needs of both the technique [including monitoring] and its possible complications; awareness of the need to ensure that resuscitation equipment is regularly checked, maintained and includes all the drugs and equipment necessary for advanced life support		
CD_AK_13	Discusses the inherent risks associated with the use of infusions and/or multiple drugs with synergistic actions, the potential of narrow therapeutic index and reduced margin of safety and the danger of such techniques when not used in a setting equipped with full resuscitation and general anaesthetic facilities	A,C	1,2,3,4
CD_AK_14	Discusses the following in relation to the use of conscious sedation in children for dentistry in the out-patient/non-hospital setting [cross ref paeds]: • The implications of administering pharmacological sedation to children at a site remote from immediate support and facilities in the event of untoward incidents [airway obstruction, respiratory depression, cardiorespiratory collapse] • The recommendation that inhalational sedation [nitrous oxide/oxygen], titrated to the individual child's needs, is suitable for use in dental out-patient/non-hospital settings • Intravenous sedation for children should only be provided in an environment with equipment and facilities equivalent to those found in NHS hospitals which admit children with emergencies • That children undergoing intravenous sedation must be managed by staff who have received appropriate training and been deemed competent; this includes competence in paediatric life support • Anaesthetic staff administering sedation to children should have been trained equivalent to that detailed in the 'higher level' paediatric anaesthesia section of the curriculum [Cross ref] including paediatric life support	A,C	1,2,3,4
CD_AK_15	Describes why all staff involved in out-patient dental sedation practices need to understand: • The implications of sedation for medically compromised patients, with particular regard to limitations imposed by the non-hospital environment • How to monitor sedated patients including the use of commonly used sedation scoring systems • The need for robust recovery and discharge criteria and the importance of appropriate escort arrangements • The principles of the Mental Capacity Act 2005 in relation to special care dentistry	A,C	1,2,3
CD_AK_16	Discusses the specific complications associated with conscious sedation techniques for dentistry and their management	A,C	1,2
CD_AK_17	Discusses how general anaesthesia may have a role in the management of the anxious or phobic dental patient	A,C	1,2,3

Skills for conscious sedation in dentistry			
Competence	*Description*	*Assessment Method*	*GMP*
CD_AS_01	Demonstrates an understanding that conscious sedation for dentistry in the dental practice setting requires: • Recognition that it is very different from the sedation delivered by anaesthetists in the hospital setting • An ability to select, assess and determine suitability of patients for treatment under conscious sedation, including the ability to decide which patients may be treated in the non-hospital setting and those whose interests would be best served by referral to a hospital facility • An ability to communicate effectively with patients and be sympathetic to their anxieties or phobia • An ability to work as a member of a multi-professional team, showing good communication skills • An appreciation of the importance of regular update and team scenario training of the management of sedation-related complications and medical emergencies	A,C,M	1,2,3,4
CD_AS_02	Demonstrates skill in titrating drug[s] to a recognised end-point, avoiding the risks implicit in over-sedation in the remote dental out-patient setting, and the need for the same level of care and monitoring as general anaesthesia should this occur	A,C	1,2,3,4
CD_AS_03	Demonstrates mastery in the peri-procedural care of patients when using any of the following standard conscious sedation techniques [including an ability to teach less experienced trainees]: • Inhalation sedation using nitrous oxide and oxygen • Intravenous sedation using midazolam alone • Oral / transmucosal benzodiazepine	A,C,M	1,2,3,4
CD_AS_04	Demonstrates mastery in the peri-procedural care of patients when using any of the following alternative conscious sedation techniques [including an ability to teach less experienced trainees]: • Any form of conscious sedation for patients under the age of 12 years other than nitrous oxide / oxygen inhalation • Benzodiazepine plus any other agent with sedative effects [e.g. opioid, propofol, ketamine] • Propofol either alone or with any other agent [e.g. benzodiazepine, opioid, ketamine] • Inhalation sedation using any other agent other than nitrous oxide / oxygen • Techniques simultaneously combining two or more routes of administration	A,C,M	1,2,3,4
CD_AS_05	Demonstrates mastery in the peri-procedural care of patients requiring the use of infusion or TCI pumps for conscious sedation	A,C	1,2
CD_AS_06	Demonstrates maturity in clinical decision-making such that unnecessary complications are avoided by the use of timely interventions, or abandonment of a technique, when it has proved problematic or unsuccessful	A,C,M	1,2,3,4

Skills for conscious sedation in dentistry			
Competence	*Description*	*Assessment Method*	*GMP*
CD_AS_07	Demonstrates competence in advanced paediatric life support and ability to lead a multidisciplinary team in such resuscitation [S] [Cross reference paediatrics]	A,S	1,2,3,4
CD_AS_08	Demonstrates the necessary maturity and clinical leadership required to lead the multi-disciplinary team in the management of unexpected medical emergencies that may arise in an isolated out-patient dental surgery whenever CS is used as a treatment	A,C,M	1,2,3,4
CD_AS_09	Demonstrates active participation, engagement and leadership where appropriate in inter-disciplinary team meetings developing safe and effective patient management services in this area of practice	A,C,M	1,2,3,4

Orthopaedics

Advanced training in anaesthesia for orthopaedic surgery should be delivered in centres undertaking a wide variety of complex elective and emergency surgical cases in this area. It is recommended that between three and six months is spent on this dedicated advanced unit of training and it is likely that many will combine this unit with the regional anaesthesia advanced unit.

Learning outcomes:

- Gain mastery in the delivery of safe and effective perioperative anaesthetic care to patients undergoing complex orthopaedic procedures
- Gain mastery in the management of major orthopaedic surgical lists and in doing so demonstrating the necessary multi-disciplinary leadership, communication and team-working skills necessary to ensure the care delivered benefits both the patient and the organisation
- Gain maturity in understanding the importance of utilising the time allocated to clinical sessions effectively, so maximising patient throughput whilst not compromising safety
- Gains the necessary maturity to guide the choice of audit cycles/quality improvement projects in developing practice
- Becomes familiar with recent developments in perioperative anaesthetic care to this area of practice, to evaluate these developments and to advise colleagues of useful changes in practice

Core clinical learning outcomes*:*

- To be capable of undertaking the perioperative anaesthetic care for a wide variety of complex orthopaedic cases [including major spinal cases +/- pleural breech] and list management independently; this implies an ability to:
  - Provide perioperative anaesthetic care to a wide-range of surgical cases demonstrating a fundamental understanding of the problems encountered
  - Show the decision making and organizational skills required of an anaesthetist to manage busy operating sessions that involve patients having major orthopaedic surgery and ensuring that the care delivered is safe and timely, benefiting both the patient and the organisation
  - To assist colleagues in decisions about the suitability of surgery in difficult situations
  - Provide teaching to less experienced colleagues of all grades

Knowledge			
Competence	*Description*	*Assessment methods*	*GMP*
OR_AK_01	Discusses, in depth, the decision making and clinical reasoning required to promote the use of safe and effective perioperative anaesthetic care for a wide variety of surgical procedures, whilst also recognising their limitations, showing	A,C,M	1,2,3,4

Knowledge			
Competence	*Description*	*Assessment methods*	*GMP*
	maturity in the final decision making process; this includes the provision of such peri-operative anaesthetic management of any major/complex and high risk elective and emergency orthopaedic case[s] [including that where the pleura may be breached]		
OR_AK_02	Through in-depth discussions shows a clear understanding of: • Why effective decision making, communication, team-working and organization skills are required by anaesthetists to ensure clinical sessions are delivered safely, efficiently and effectively to the benefit of both patients and the organisation; this implies an ability to recognise the importance of providing overall leadership of the multi-disciplinary team when necessary • How to utilise the time allocated to clinical sessions effectively, so maximising patient throughput whilst not compromising safety • The central role human factors plays in developing a culture of safe practice and how collaboration and team working enhances safety	A,C	1,2,3,4
OR_AK_03	Critically analyses current trends in the development and provision of all aspects of anaesthetic care for a wide variety of major orthopaedic surgical conditions showing maturity in the final decision making process; this implies the need to remain abreast of developments in the field by reading specialist journals and attending relevant specialist meetings	A,C	1,2,3,4
OR_AK_04	Understands the importance of research [clinical and laboratory] in the development of anaesthetic practice for these surgical specialties, is aware of current areas of research and achieves competence in understanding, and explaining, the methodology and statistics involved	C	1,2,3,4
OR_AK_05	Describes how their special training and experience in this branch of anaesthesia will contribute to their further career development	C	1,2,3,4
OR_AK_06	Accepts that, being an expert in this special interest area of practice, they have a particular responsibility for: • The safety and quality of their service over and above their personal clinical contribution • Understanding that others may be less expert than they are and thus to behave sensitively when asked for advice • Teaching and leading within the area • The proper development of special fields of practice within the clinical and management contexts of a Department of Anaesthesia, as well as advocate and arbiter within the field when needed Informing managers of any developments in this field of practice that is likely to have impact on the safety, quality and cost of services	C	1,2,3,4

Skills			
Competence	*Description*	*Assessment methods*	*GMP*
OR_AS_01	Demonstrates maturity in the decision making, clinical reasoning and clinical leadership skills required to engage appropriately with colleagues in the multi-disciplinary team, so providing high quality, safe strategy, perioperative anaesthetic care for a wide variety of complex elective and emergency orthopaedic procedures [including that where pleural breach may occur]	A,L,M	1,2,3,4
OR_AS_02	Demonstrates maturity in managing major orthopaedic lists; this includes demonstrating the leadership, communication and team-working skills necessary to ensure the theatre time and resources are used efficiently and effectively, whilst ensuring patient safety is not compromised	L,M	1,2,3,4
OR_AS_03	Demonstrates an ability to engage all members of the theatre team where required, to enable theatre time to be used efficiently and effectively for the benefit of both the patients and the organisation; this implies an ability to lead the discussions in a timely and effective manner where/when necessary	L,M	1,2,3,4
OR_AS_04	Demonstrates the ability to teach and supervise junior colleagues in all aspects of peri-operative anaesthetic care for complex major orthopaedic surgery; in so doing has a particular focus on the safety and quality of practice	A,M	1,2,3,4
OR_AS_05	Demonstrates the ability to design, complete and evaluate audits/quality improvement projects related to this area of clinical practice	M	1,2
OR_AS_06	Demonstrates active participation in educational programmes within this field of practice	M	1
OR_AS_07	Demonstrates active participation, engagement and leadership where appropriate in inter-disciplinary team meetings developing safe and effective patient management services in this area of practice	A,C,M	1,2,3,4

Regional

Advanced training in regional anaesthesia should be delivered in centres undertaking a wide variety of simple and complex regional anaesthetic techniques on both elective and, where appropriate, emergency surgical cases. It is recommended that up to six months are spent on this dedicated advanced unit of training and that, where appropriate training and experience should be gained in more than one centre.

Learning outcomes:

- Gain mastery in a wide range of regional anaesthetic techniques using a variety of methods to assist in the identification and safe placement of needles and catheters, including in-depth understanding of the place and use of ultrasound
- Gain mastery in the management of surgical lists in which regional anaesthetic techniques have a major role in the peri-operative anaesthetic care and in doing so demonstrating the necessary leadership, communication and team-working skills necessary to ensure this benefits both the patient and the organisation
- Integration of regional anaesthetic techniques into acute pain management in surgical, trauma and medical patients where appropriate
- Gain maturity in understanding the importance of utilising the time allocated to clinical sessions effectively, optimising throughput whilst not compromising patient safety
- Gain the necessary maturity to guide the choice of audit cycles/quality improvement projects in developing practice
- Becomes familiar with recent developments in regional anaesthesia, to evaluate these developments and to advise colleagues of useful changes in practice
- Becomes a balanced advocate for the use of regional anaesthetic techniques

Core clinical learning outcomes*:*

- To be capable of undertaking a wide variety of regional anaesthetic techniques independently; this implies an ability to:
  - Provide perioperative anaesthetic care to a wide-range of surgical cases performed under regional anaesthesia, demonstrating a fundamental understanding of the problems encountered
  - Show the decision making and organizational skills required of an anaesthetist to manage busy operating sessions that involve patients having regional anaesthesia as part of their anaesthetic planned care
  - Assist colleagues in decisions about the use of regional anaesthesia in difficult situations and where their use might be controversial
  - Provide teaching to less experienced colleagues of all grades
- Provide advice to colleagues on the appropriate practice of regional anaesthesia

Knowledge

Competence	*Description*	*Assessment Methods*	*GMP*
RA_AK_01	Demonstrates in-depth understanding of advance ultrasound scanning, including: • The effect of ultrasound imaging modalities on the performance of regional anaesthetic techniques e.g. harmonic imaging, multibeam, 3D and volume rendering • The use of advanced ultrasound needle design to maximise visibility during procedures • Describing ideal and non ideal patterns of spread of local anaesthetics, with respect to efficacy and complications e.g. intraneural and intravascular injection • Detailed knowledge of the relevant sonoanatomy in relation to sectional anatomy, including anatomical variations, of vascular, nervous [e.g. the brachial plexus, lumbosacral plexus and terminal peripheral nerves] and muscular tissues • A knowledge of common ultrasound artifacts • The need to record, and store, ultrasound images relevant to clinical practice • The place of ultrasound in clinical management of patients, including medico-legal aspects	A,C	1,2

Skills			
Competence	*Description*	*Assessment methods*	*GMP*
RA_AS_01	Demonstrates mastery in a wide variety of regional anaesthetic techniques, including but not exclusively: • The interscalene, supraclavicular, infraclavicular and axillary approaches to the brachial plexus • Thoracic paravertebral and intrapleural blocks • Lumbar plexus and combined lumbar plexus and sciatic blocks • The initial placement and use of indwelling catheters	A,D	1,2,3,4
RA_AS_02	Demonstrates the use of advanced ultrasound techniques in regional anaesthesia including neuraxial scanning and catheter placement	A,D	1,2
RA_AS_03	Demonstrates mastery in the use of adjuncts to enhance safe practice when providing regional anaesthesia techniques [including ultrasound and nerve stimulators]	A,D	1,2,3,4
RA_AS_04	With regard to ultrasound, demonstrates high levels of skill including: • The use of appropriate selection of probes for different techniques, with precise probe control and minimum unintentional movement • Demonstrate the relevant sononantomy of the peripheral nerves and surrounding structures of the brachial plexus and arm ,thoracic and lumbar spine, lumbosacral plexus and lower limb,including the muscles of the anterior abdominal	A,D	1,2

Skills			
Competence	*Description*	*Assessment methods*	*GMP*
	wall and inguinal region and be confident in the performance of regional anaesthetic techniques in these areas.		

Trauma and stabilisation

Advanced training in trauma should be delivered in designated trauma centres receiving a large number of major trauma cases [ideally 250 per year or more, with an injury Severity Score of over 15]; in addition such units should have neurosurgical services on-site. It is expected six months will need to be spent acquiring all the competencies/leaning outcomes in this advanced unit of training. There are many competencies that are common to other advanced units, particularly those related to Transfer and it is anticipated that many trainees who undertake advanced trauma would expect to complete the associated units over a one year advanced programme. **Candidates are strongly encouraged to undertake training in major incident management [e.g. MIMMS course].**

Learning outcomes:

- Gain mastery in leading the delivery of safe and effective multi-disciplinary care to multiply-injured patients as Trauma Team Leader
- Gain in-depth understanding of the role of pre-hospital care in the clinical management of the multiply-injured patient and how this should link seamlessly with in-hospital care
- Gain mastery in the anaesthetic management of such cases, from reception in the Emergency Department through definitive treatment, and in doing so demonstrating the necessary multi-disciplinary leadership, communication and team-working skills necessary to ensure the care delivered benefits both patients and the organisation
- Gains the necessary maturity to guide the choice of audit cycles/quality improvement projects in developing practice and links with national trauma audit programmes
- Becomes familiar with recent developments in clinical care in this area of practice, to evaluate these developments and to advise colleagues of useful changes in practice

Core clinical learning outcomes*:*

- To be capable of leading the clinical care of the multiply injured patient from reception in the emergency department independently; this implies an ability to:
  - Provide leadership in the discussions with the emergency services managing the multiply injured patient at the site of injury through to arrival in the Emergency Department
  - Demonstrates good interpersonal skill, assertiveness [when needed] and leadership as Trauma Team Leader when leading the multi-disciplinary team that receives, assesses and delivers the necessary definitive care to the patient
  - Provides safe and effective anaesthetic care for a wide-range of complex cases including challenging head, airway, neck and spine, chest, abdominal, spinal, pelvic and limb, soft tissue and vascular trauma in both adults and children, demonstrating a fundamental understanding of the problems encountered
  - Show the decision making, organizational and communication skills required of a trauma team leader to manage a busy receiving area for patients with multiple injuries, ensuring that the care delivered is safe and timely, benefiting both the patient and the organisation
  - Assist colleagues in decisions about the suitability of surgery/further definitive care in difficult situations

- Lead discussions on end of life decisions with compassion, using appropriate language that can be understood by relatives and carers
- Provide teaching to less experienced colleagues of all grades

Knowledge			
Competence	*Description*	*Assessment methods*	*GMP*
MT_AK_01	Discusses, in-depth, the importance of major incident planning within hospitals, the roles and responsibilities of all healthcare professionals [including senior medical staff of all disciplines] and the key roles that the trauma team leader may be required to undertake in such incidents. This will include the ability to respond to requests from the media for information, statements and interviews.	C	1,2
MT_AK_02	Shows an in-depth knowledge and understanding of the use of: • Permissive hypotension [or deliberate temporary under-resuscitation in the face of uncontrolled bleeding • Immediate thoracotomy in penetrating trauma with witnessed or impending loss of vital signs	C	1,2
MT_AK_03	Discusses in depth the responsibilities associated with the role of trauma team leader including: • Advise to referring hospital or pre-hospital carers at time of referral • Obtaining history from paramedics on arrival and perform or supervise primary and secondary assessments/supervising all spinal precautions • Establish priorities for investigation, monitoring and intervention including bloods, fluids, analgesics • Coordinate team members, ordering procedures, receiving information, listening to suggestions and resolving disputes/conflicts within the team • Maintaining an overview, avoiding undue involvement in practical procedures, but intervening appropriately in critical situations • Order and interpret investigations, in conjunction with team members, radiologist and other specialists as needed • Request surgical intervention and consult with or refer to other specialists where appropriate • Supervising patient transfer and radiological investigation • Arranging destination/bed allocation in the appropriate primary specialty, handing over care to the operating room, intensive care unit or trauma ward, and reviewing subsequently to maintain continuity and informing the family • Excuse team members at the end of the resuscitation, debriefing them after difficult cases • Record information for quality assurance • Make a record in the hospital notes and send a letter to the GP and any referring hospital • Ensure involvement in national trauma audit programmes • Understanding the importance of have no other [conflicting] clinical responsibilities while on duty as trauma team leader	C	1,2,3,4

Knowledge			
Competence	*Description*	*Assessment methods*	*GMP*
MT_AK_04	Understands the importance of gaining pre-hospital experience, including the use of helicopters for transfer [Cross reference Transfer]	C	1,2,3,4

Skills			
Competence	*Description*	*Assessment methods*	*GMP*
MT_AS_01	Demonstrates the ability to conduct interviews with both press and television reporters, providing factual, non-intrusive information bearing in mind the need to maintain patient confidentiality.	A,C,M	1,2,3,4
MT_AS_02	Demonstrates ability to lead a multi-disciplinary trauma team, co-ordinating and delivering the early hospital care of all types of complex multiply-injured patients including, initial resuscitation and imaging, peri-operative care and appropriate HDU/ICU admission	A,C,M	1,2,3,4
MT_AS_03	Demonstrate mastery in: • The interpretation of plain radiographs and CT scans and in the performance of focused assessment with sonography in trauma [FAST] • The interpretation of near-patient tests such as thrombo-elastography [TEG] • Managing acute pain relief and airway control in the face of hypovolaemia and/or altered consciousness • Providing immediate analgesia and/or anaesthesia for immediately limb-threatening fractures/dislocation • The use of permissive hypotension [or deliberate temporary under-resuscitation in the face of uncontrolled bleeding] • Immediate thoracotomy in penetrating trauma with witnessed or impending loss of vital signs • Setting up appropriate resuscitation room equipment and preparing contents for transport packs at the strategic and practical level	A,C,M	1,2,3,4

Transfer Medicine and Emergency Medical Retrieval [Optional /Advanced]

This unit of training is aimed at those trainees with a specialist interest in transfer medicine and retrieval of patients requiring international transfer. It is expected that trainees will have completed the higher Trauma/Stabilisation units along with specialised training in the following as part of this unit:

- Pre-hospital training
- Emergency medical services training
- Basic aeronautical training
- Media training

Because of the skills trainees at this level will acquire, they may also have responsibility for pre-hospital care and therefore some of the key competencies for this speciality have been included within this section.

Learning outcomes:

- Gain mastery in leading the delivery of safe and effective multi-disciplinary care to all patients requiring retrieval and/or transfer, however complex
- Gain in-depth understanding of the role of pre-hospital care in the clinical management of patients requiring retrieval from remote and inhospitable environments, the choices for safe transfer and how this should link seamlessly with in-hospital care
- Gain mastery in the clinical care of such cases and in doing so demonstrating the necessary multi-disciplinary leadership, communication and team-working skills necessary to ensure the care delivered benefits both patients and the organisation
- Gains the necessary maturity to guide the choice of audit cycles/quality improvement projects in developing practice and links with national audit programmes
- Becomes familiar with recent developments in clinical care in this area of practice, to evaluate these developments and to advise colleagues of useful changes in practice

Core clinical learning outcomes*:*

- To be capable of leading the clinical care of the most complex patient requiring retrieval/transfer from, and between, any site independently; this implies an ability to:
  - Provide leadership in the discussions with the emergency services at the site of injury through to retrieval and transfer
  - Demonstrate good interpersonal skills, assertiveness [when needed] and leadership when leading the multi-disciplinary retrieval/transfer team
  - Provides safe and effective clinical care to a wide-range of complex cases, both adults and children, requiring retrieval/transfer, demonstrating a fundamental understanding of the problems encountered
  - Assist colleagues in decisions about the suitability of retrieval/transfer in difficult situations
  - Provide teaching to less experienced colleagues of all grades

Knowledge			
Competence	*Description*	*Assessment methods*	*GMP*
Transfer and retrieval medicine			
TF_AK_01	Discusses in-depth : • The risks/benefits of patient transfer by air [Cross Ref; transfer - intermediate] • The hazards associated with prolonged air transfer, including but not exclusively physical, psychological and organisational • How time-critical elements may influence risk to the patient and transfer personnel and explains how they should be managed • The advantages and describes specific hazards associated with different modes of transport including: Road; Rotary wing aircraft; Fixed wing aircraft [Cross ref; transfer-higher] • The need for patient stabilisation prior to transfer, as well as the limited nature of interventions possible during prolonged flight • The increased risk involved with critical care interventions in isolated environments • The importance of optimal triage to receiving specialty/hospital • The need for effective communication and documentation at all stages [Cross ref: transfer intermediate] • The implications of adults with an incapacity as defined by the Adult with Incapacity Act • The differing levels of healthcare facilities across a HEMS/EMRS catchment area • The risks and procedures for night time operations	C	1,2
Critical care			
TF_AK_02	Discusses in-depth, the critical care equipment carried by HEMS/EMRS, including but not exclusively: • Ventilators, including: different modes of ventilation; the selection of appropriate parameters in e.g. Asthma/COPD and ARDS • Infusion pumps • Monitoring	C	1
Pre-hospital care			
TF_AK_03	Discusses in-depth: • The factors involved in scene safety, including but not exclusively: o Personnel protective clothing [PPE] o Situational awareness and safety at the scene o Role of emergency services	C	2,3

	• The concept of key differences between hospital and the pre-hospital environment		
TF_AK_04	Discusses in-depth: • Pre-hospital scene management • Triage sieve and sorting • Scene time minimisation while appropriately treating and stabilising patients for transfer	C	1,2,3
TF_AK_05	Lists and explains the current criteria for emergency pre-hospital retrieval and explains the relevant standard operating procedures [SOPS]	C	1,2
TF_AK_06	Discusses in-depth: • Basic techniques for vehicle extrication • Pre-hospital sedation/analgesia to facilitate extrication • Mode of transport decision process • HAZCHEM systems and decontamination	C	1
Non-technical skills including CRM			
TF_AK_07	Discusses in-depth: • Concept of non-technical skills or crew resource management [CRM] • Component parts of [CRM], including but not exclusively o Situational awareness o Decision making o Source of errors o Leadership and team working o Stress and fatigue on performance	C	1,2,3,4
Aviation			
TF_AK_08	Lists and explains civil aviation law in respect of, but not exclusively: • Visual flight rules • Instrument flight rules and amendments specific to HEMS type operations	C	1,2
TF_AK_09	Explains the environmental effects and their implications on flight such as weather and night	C	1,2
TF_AK_10	Outlines the process and considerations for the selection of a helicopter landing site and explains the safety issues	C	1,2
TF_AK_11	Explains the procedure for boarding and disembarking an aircraft with engines running. [TF_HK_04]	C	2,3
TF_AK_12	Explains the operation of the onboard communications systems [TF_HK_06]	C	1,3
TF_AK_13	Outlines aircraft ditching and evacuation procedures [TF_HK_05]	C	2,3
TF_AK_14	Explains the safety procedures for specific aircraft, including but not exclusively: • Eurocopter EC135 • Westland Sea King	C	2,3

	• Beechcraft King Air • Sikorsky S-92		
TF_AK_15	Explains basic map navigation	C	1
Major incident management			
TF_AK_16	Discusses in-depth: • Major incident definition and its management in a rural context • HEMS/EMRS response to a major incident • Major incident management including operational [bronze]/tactical [silver] and strategic [gold] levels of command • Roles of each emergency service represented at the scene • CHALETS structure to major incident information • Component parts of the CSCATTT acronym for prioritisation of tasks at the scene • Variation of HEMS/EMRS role in major incidents	C	1,2,3
TF_AK_17	Explains how to use radio communications and the associated etiquette for that particular communications network	C	1,3
Governance			
TF_AK_18	Discusses in-depth: • Risk management including significant event reporting, root cause analysis and risk assessment • Importance of SOPs and checklists • Need for continuous audit of procedures and outcomes against appropriate standards	A, C,M	1,2,3
TF_AK_19	Explains the need for and describes equipment maintenance standards including daily and monthly checks	D,A,M	1,2,3
Administration and management			
TF_AK_20	Outlines and explains the procedures involved in maintenance of drug and equipment stock	D,M	1,2,3
TF_AK_21	Outlines the procedures for purchasing new equipment	D,C	1,2,3

Skills			
Competence	*Description*	*Assessment methods*	*GMP*
Transfer and retrieval medicine			
TF_AS_01	Demonstrates ability to evaluate risk/benefit for spectrum of patients referred to HEMS/EMRS	A,C	1,2,3
TF_AS_02	Demonstrates ability to select the appropriate mode of transport	A,C	1,2,3
TF_AS_03	Demonstrates ability to stabilise patients for transfer with a view to minimising specific risks	A,C	1,2

TF_AS_04	Demonstrates ability to optimally package patients in order to minimise risks	A,C,M	1,2,3
TF_AS_05	Demonstrates ability to manage retrieval referral from initial call to arrival destination under direct supervision	A,M	1,2,3
TF_AS_06	Demonstrates ability to seek appropriate information to ensure treatment is appropriate under Adults with Incapacity Act	A,C,M	1,2,3,4
TF_AS_07	Demonstrates an appreciation of the demands and constraints faced by rural primary care practitioners	A,C,M	1,2,3
TF_AS_08	Demonstrates an appreciation of the important role of non-medical transfer personnel e.g. aircrew	A,C,M	2,3,4
Critical care			
TF_AS_09	Demonstrates ability to assess and treat critically ill patients in a structured and prioritised fashion	A,M	1,2,3
TF_AS_10	Demonstrates ability to resuscitate and stabilise critically ill patients and to optimise safety during transfer	A,M	1,2,3
TF_AS_11	Demonstrates patient ventilation using transfer ventilators used by HEMS/EMRS	A,M	1,2,3
TF_AS_12	Demonstrates establishment of invasive monitoring of blood pressure [TF_IS_04]	A,M	1,2,3
TF_AS_13	Demonstrates establishment of central venous access [TF_IS_04]	A,M	1,2,3
TF_AS_14	Demonstrates effective treatment of tension and simple pneumothoraces, and haemothoraces	A,M	1,2,3
TF_AS_15	Demonstrates establishment of infusion of inotrope/vasopressor	A,M	1,2
TF_AS_16	Demonstrates the safe packaging of a sedated, ventilated patient for transfer	A,M	1,2,3
TF_AS_17	Demonstrates ability to seek appropriate information to ensure treatment appropriate under the Adult with Incapacity Act	A,M	1,2,3,4
TF_AS_18	Demonstrates recognition of appropriate limitations of critical care and the place of ‘end of life’ decisions	A,M	1,3,4
Pre-hospital care			
TF_AS_19	Demonstrates the ability to identify and liaise with the site controller at a major incident	A,M	2,3
TF_AS_20	Demonstrates the skills of triage appropriate for the situation	A,M	1,2
TF_AS_21	Demonstrates safe extrication skills appropriate for the situation	A,D,M	1,2,3,4
TF_AS_22	Demonstrates ability to identify when the patient is in an appropriate condition for transfer and the most appropriate mode of transport	A,D,M	1,2,3,4
TF_AS_23	Demonstrates situational awareness and safety in transfers, both primary and secondary	A,D,M	1,2,3,4
TF_AS_24	Demonstrates an ability to work in unusual/adverse situations, with the ability to seek help and advice when necessary	A,D,M	1,2,3,4
TF_AS_25	Demonstrates crew resource management (CRM) skills	A,D,M	1,2,3,4
TF_AS_26	Demonstrates advanced aero (visual), maritime and land navigation skills	A,D,M	1
TF_AS_27	Demonstrates media handling skills for the situation	A,M	3
TF_AS_28	Demonstrates a willingness to audit processes, participate in /quality improvement projects, record any critical incidents and	M	1,2,3,4

	become involved in research		
TF_AS_29	Demonstrates ability to assess and approach the scene taking responsibility for own safety	A,M	2,3,4
TF_AS_30	Demonstrates ability to function as an effective team member during all aspects of pre-hospital care including pre-hospital emergency anaesthesia	M	1,2,3,4
TF_AS_31	Demonstrates effective communication with other team members and emergency services at the scene	M	3
TF_AS_32	Demonstrates appropriate pelvic and limb splintage	A,M	1,2,3
TF_AS_33	Demonstrates spinal immobilisation and packaging of patient prior to transfer	A,M	1,2,3,4
TF_AS_34	Demonstrates an awareness of personal and professional hazards in operating in the pre-hospital care environment and the ability to utilise PPE	A,M	2,3
Non-technical skills including CRM			
TF_AS_35	Demonstrates ability to apply CRM principles in the HEMS/EMRS environment [TF_HS_04]	A,M	2,3
TF_AS_36	Demonstrates situational awareness and contributes to the maintenance of situational awareness in others [TF_IS_06]	A,M	2,3
TF_AS_37	Demonstrates effective communication skills and assertiveness including 'speaking up'	A,M	3,4
TF_AS_38	Demonstrates ability to function as a team leader and team member when appropriate [TF_HS_04]	A,M	3,4
TF_AS_39	Demonstrates an insight into the effects of stress and fatigue on own ability to perform safely and effectively	A,M	1,2,3
TF_AS_40	Demonstrates the importance of developing non-technical skills in parallel to technical competence	A,M	1,2,3
TF_AS_41	Demonstrates active participation in briefing and de-briefing	A,M	3
Aviation			
TF_AS_42	Demonstrates ability to apply civil aviation law and operational considerations to the HEMS primary and retrieval missions	A,M	1,2,3
TF_AS_43	Demonstrates safe embarkation and disembarkation from aircraft while engines are running	A,M	2,3
TF_AS_44	Demonstrates ability to use onboard voice communication suite for optimal communications including appropriate phraseology and phonetic alphabet [TF_HS_06]	A,M	1,3
TF_AS_45	Demonstrates ability to load equipment, stretcher and patient via cabin doors while engines are running [hot load/unload]	A,M	1,2,3
TF_AS_46	Demonstrates ability to provide aircraft captain/flying pilot with running commentary when 'on comms'	A,M	1,2,3
TF_AS_47	Demonstrates participation in selection of helicopter landing site	A,M	1,2,3
TF_AS_48	Demonstrates knowledge of the differing considerations when flying with military SAR services	A,M	1,2,3
TF_AS_49	Demonstrates participation as a crew member and responsibility for own safety and role within the team	A,M	1,2,3,4
Major incident management			
TF_AS_50	Demonstrates ability to communicate and participate effectively using the CHALETS and CSCATTT framework	A,M	1,2,3

TF_AS_51	Demonstrates triage of casualties using sieve and sort frameworks	A,M	1,2,3
TF_AS_52	Demonstrates an appreciation of aspects of rural health care which may affect when a major incident is declared	A,M	1,2,3,4
Governance			
TF_AS_53	Demonstrates ability to write SOPs and checklists	M	1,2
TF_AS_54	Demonstrates the identification of and reporting of significant events	A,M	1,2,3
TF_AS_55	Demonstrates contribution to analysis of significant events and development of solutions to identified problems	A,M	1,2,3
TF_AS_56	Demonstrates presentation of incidents/cases to clinical governance meetings	M	1,3
TF_AS_57	Demonstrates willingness to identify and report significant events	A,M	1,3
TF_AS_58	Demonstrates adherence to SOPs and checklists; and encourages others to do so	A,M	1,2,3
TF_AS_59	Demonstrates adherence to equipment checking schedules and procedures	A,M	1,2,3

Acknowledgement: The Emergency Medical Retrieval Service of Scotland Curriculum and Competency Objectives.

Obstetrics

Advanced training in obstetric anaesthesia should be delivered in centres which include dedicated obstetric high dependency care facilities and that undertake a wide variety of complex elective and emergency obstetric cases and procedures.

Learning outcomes:

- Gain mastery in the delivery of safe and effective perioperative anaesthetic care to patients undergoing complex obstetric procedures
- Gain mastery in the management of busy labour ward and elective and emergency obstetric theatre sessions, and in doing so demonstrating the necessary multi-disciplinary leadership, communication and team-working skills necessary to ensure the care delivered benefits both the patient and the organisation
- Gain maturity in understanding the importance of utilising the time allocated to clinical sessions effectively, optimising throughput whilst not compromising patient safety
- Gains the necessary maturity to guide the choice of audit cycles/quality improvement projects in developing practice
- Becomes familiar with recent developments in perioperative anaesthetic care to this area of practice, to evaluate these developments and to advise colleagues of useful changes in practice

Core clinical learning outcomes:

- To be capable of undertaking the perioperative anaesthetic care for a wide variety of complex obstetric cases and list management independently; this implies an ability to:
  - Provide perioperative anaesthetic care to a wide-range of obstetric cases performed both in the labour ward and theatre, demonstrating a fundamental understanding of the problems encountered
  - Show the decision making and organizational skills required of an anaesthetist to manage busy labour ward and operating sessions, ensuring that the care delivered is safe and timely, benefiting both patients and the organisation
  - To assist colleagues in decisions about the suitability of surgery in difficult situations
  - Provide teaching to less experienced colleagues of all members of the multi-disciplinary team

Knowledge			
Competence	*Description*	*Assessment Methods*	*GMP*
OB_AK_01	In-depth understanding of the principles and practices of the use of local infiltration for Caesarean section and caudal	C	1,2

Knowledge			
Competence	*Description*	*Assessment Methods*	*GMP*
	anaesthesia in obstetrics		
OB_AK_02	In-depth knowledge of obstetric practice, particularly intra-partum management, and related midwifery and paediatric issues	A,C	1,2,3,4
OB_AK_03	In-depth understanding of general ultrasound and Doppler study estimations of fetal well-being	A,C	1
OB_AK_04	In-depth understanding of the specific risk management issues related to obstetric practice and the potential medico-legal consequences	A,C	1,2,3,4

Paediatrics

Advanced training in paediatric anaesthesia should be delivered in a designated specialist centre undertaking a wide variety of complex elective and emergency paediatric procedures, with the necessary associated paediatric critical care facilities. This Paediatric unit is designed for those trainees who wish to be paediatric leads in the DGH environment (6 months) and those trainees who wish to specialise as paediatric anaesthetists in a tertiary centre (12 months) Trainees are encouraged to gain experience in more than one such centre if at all possible **during their overall training**. In its simplest form this might include paediatric anaesthetic practice in both the tertiary centre and a DGH within a rotational training programme. However 12 months training in a tertiary centre is essential for those wishing to practice as specialist paediatric anaesthetists. Both six and twelve month placements should include aspects of paediatric critical care.

Learning outcomes:

For a DGH anaesthetist with a regular commitment to children's anaesthesia:

- To be capable of practicing anaesthesia post-CCT with a special interest in paediatric anaesthesia as a consultant with specific responsibility for paediatric anaesthesia in a district general hospital. This implies an ability to:
  - Gain mastery in the delivery of safe and effective perioperative/periprocedural anaesthetic care to a wide-range of paediatric surgery/procedures normally performed in the DGH , including those with complex co-existing disease
  - Gain mastery in the management of such cases, and the critically ill child when needed, and in doing so demonstrating the necessary multi-disciplinary leadership, communication and team-working skills necessary to ensure the care delivered benefits both the patient and the organisation
  - Gain maturity in understanding the importance of utilising the time allocated to paediatric clinical sessions effectively, optimising throughput whilst not compromising patient safety
  - Communicate compassionately and effectively with children and young people, parents and other carers throughout the surgical episode, and also communicate effectively within the multi-disciplinary paediatric team
  - Gains the necessary maturity to guide the choice of audit cycles/quality improvement projects in developing practice within this subspecialty area and understands the legality of consent in children and young people, in relation to research, restraint and procedures
  - Becomes familiar with recent developments in perioperative anaesthetic care to this area of practice, to evaluate these developments and to advise colleagues of useful changes in practice
- Knowledge of the drivers for the provision of paediatric services in the DGH [National Service Frameworks etc]

For the Paediatric specialist in a Tertiary centre, in addition to the above:

- To be capable of practicing post-CCT anaesthesia as a consultant paediatric anaesthetist in a specialist paediatric hospital or tertiary referral centre. This implies an ability to:
  - Gain mastery in the delivery of safe and effective perioperative anaesthetic care to a wide range of complex paediatric surgical cases, including the very premature sick neonate and those children with complex co-existing disease. The precise skill mix required will depend upon the nature of the post and may or may not include patients undergoing cardiothoracic or neuro surgery
- Knowledge of the drivers for the provision of paediatric services in the tertiary centre

Core clinical learning outcomes*:*

For a DGH anaesthetist with a regular commitment to children's anaesthesia:

To be capable of undertaking the perioperative anaesthetic care for a wide variety of paediatric procedures performed in the DGH environment independently; this implies an ability to:

- Provide perioperative anaesthetic care to a wide-range of such cases demonstrating a fundamental understanding of the problems encountered
- Show the decision making and organisational skills required of an anaesthetist to manage busy paediatric surgical/procedural sessions ensuring that the care delivered to patients is safe and timely, benefiting both the patient and the organisation
- Communicate compassionately and effectively with children and young people, parents and other carers and members of the multidisciplinary team
- Assist colleagues in decisions about the suitability of surgery in difficult situations
- Provide teaching to less experienced colleagues of all grades

For the Paediatric specialist in a tertiary centre, additionally:

➢ To be capable of undertaking the perioperative anaesthetic care for a wide variety of complex paediatric [including neonates] surgery and other procedures independently. This implies the ability to demonstrate the above core outcomes to this level of practice.

Finally, all trainees must maintain their training in child protection. For those aspiring to be career paediatric anaesthetists, additional training is advised.

Knowledge

Competence	*Description*	*Assessment methods*	*GMP*
PA_AK_01	Is able to discuss in depth, compare and evaluate the strategies for managing neonates and children with congenital diseases that have relevance to their perioperative anaesthetic care.	A,C	1
PA_AK_02	Discusses in depth the factors involved in development and running a paediatric acute pain service	A,C	1,2
PA_AK_03	Discusses the importance of recognising and instituting correct chronic pain management in children and young people	C	1,2,3,4

Skills

Competence	*Description*	*Assessment methods*	*GMP*
PS_AS_01	Demonstrates ability to manage the paediatric difficult airway, including fibreoptic techniques	A,C,D	1,2
PS_AS_02	Performs advanced vascular access, including central venous & arterial cannulation including familiarity and use of 2D ultrasound to assist with insertion techniques	D	1,2
PA_AS_03	Demonstrates ability to provide sedation including the selection, management and monitoring of children for diagnostic and therapeutic procedures, with particular attention to working in areas outside the theatre suite but within the hospital environment	A,C	1,2,3
PS_AS_04	Demonstrates effective leadership in resuscitation and stabilisation of the critically ill child requiring transfer	A,C,D,M	1,2,3,4
PS_AS_05	Demonstrates leadership in relation to Child Protection issues	A,M	1,2,3,4

Paediatric intensive care medicine

Learning outcome:

At the end of a period of advanced paediatric intensive care medicine training an anaesthetist should be able to manage, as a member of a skilled team, the critically ill or injured child presenting in the district general hospital [As defined in the DH report - 'The critically ill and injured child in the DGH'] or, if working in a tertiary paediatric hospital, transfer a critically ill or injured child for investigation or intervention.

Core Clinical Learning Outcomes:

- To know the core differences in physiology, anatomy and pharmacology between infants, children and adults
- To recognise the signs and symptoms of clinical deterioration in infants and children which might lead to a PICU admission, including knowledge of paediatric early warning scores
- To institute, as a member of a skilled team, appropriate resuscitative measures to manage acute deterioration and stabilise the critically ill or injured child prior to transfer to a PICU
- To understand the principles and hazards of referring and transferring, when appropriate (eg acutely deteriorating head injury) a critically ill or injured paediatric patient to an appropriate referral centre for further management.
- To understand advanced monitoring techniques including but not limited to arterial and central venous pressure monitoring [including umbilical], EEG, central venous saturation, echocardiography, ultrasound
- To understand advanced organ support techniques amongst which are line placement, inhaled nitric oxide administration, High frequency oscillation, renal support (peritoneal dialysis and haemofiltration and dialysis), knowledge of ECMO and its indications and complications, intracranial pressure monitoring
- To understand the ethics and law of paediatric medical care, and in particular knowledge of child protection matters
- To understand the approach to brain death and organ donation in children

Knowledge			
Competence	*Description*	*Assessment methods*	*GMP*
PI_AK_01	Describes the principal anatomical and physiological differences in neonates and infants	A,C	1
PI_AK_02	Describes the principle pharmacological differences in neonates and infants	A,C	1

PI_AK_03	Describes the features of the sick child and clinical deterioration in children and the appropriate response	A,C	1
PI_AK_04	Describes/recalls recognised Paediatric ICM techniques of sedation and analgesia in children	A,C	1,2
PI_AK_05	Describes/recalls the management of fluids and electrolytes in medical and surgical emergencies in neonates, infants and children	A,C	1,2
PI_AK_06	Describes/recalls respiratory management of infants & children using but not limited to nasal CPAP, pressured controlled ventilation, High Frequency Oscillatory Ventilation and inhaled nitric oxide	A,C	1
PI_AK_07	Describes/recall cardiovascular organ support, including fluid resuscitation and appropriate use of vasoactive medications, understands the indications for ECMO	A,C	1
PI_AK_08	Describes/recall renal support, peritoneal dialysis and haemofiltration or dialysis	A,C	1
PI_AK_09	Describes/recalls differential diagnosis for the collapsed neonate caused by but not limited to cardiac abnormality , sepsis, metabolic abnormality or non-accidental injury	A,C	1
PI_AK_10	Describes/recalls common presentations of paediatric cardiac anomalies	A,C	1
PI_AK_11	Describes/recalls the management of paediatric medical conditions requiring critical care including but not limited to: septicaemia, acute respiratory failure, upper airway obstruction, trauma care including head injury, epilepticus, asthma and upper airway obstruction [including foreign body and infective causes], diabetic ketoacidosis and basic working knowledge of other metabolic emergencies	A,C	1
PI_AK_12	Describes/recalls the principles of the psychological aspects of critically ill or injured children	A,C	1
	Describes/recalls the causes of coma and loss of consciousness in children	A,C	1
	Describes/recalls the principles of managing premature neonates on PICU	A,C	1,2,3
	Describes/recalls the management of nutritional support for neonates, infants and children admitted to PICU	A,C	1,2,3
	Describes/recalls the management of severe trauma in children including but not limited to isolated head injuries and raised intra-cranial pressure	A,C	1,2
	Describes/recalls the causes of cardiac arrests in children and how management differs from adults	A,C	1,2,3
PI_AK_13	Describes/recalls the importance of parental roles and family dynamics in paediatric intensive care	A,C	3
PI_AK_14	Describes/recalls the equipment required for intra and inter-hospital transfer for critically ill or injured children and the reasons for centralisation of paediatric care	A,C	1
PI_AK_15	Describes/recalls the situations in which brain death may be considered, approaches to the family and brainstem death testing in children	A,C	1,3
	Describes/recalls the management of children and parents/carers for end of life care	A,C,M	1,2,3,4
PI_AK_16	Describes the procedures for child death within the Trust including but not limited to likely investigations	A,C	1,3

Skills			
Competence	*Description*	*Assessment methods*	*GMP*
PI_AS_01	Demonstrates the intra and inter-hospital transfer of critically ill or injured children	S,A	1,2,3
PI_AS_02	Demonstrates the resuscitation of infants and children and their admission to intensive care. Including intubation, insertion of arterial and central venous catheters, and intra-osseous needles	A	1,3
PI_AS_03	Demonstrates the correct selection of equipment for different ages and sizes of patients for procedures in PI_AS_02	A	1
PI_AS_04	Demonstrates early initiation of child protection measures	A	1,2,3
PI_AS_05	Demonstrates an understanding of the principles of 'listen to the child' and Gillick competence as applied to PICM	A	1,3

Pain medicine

Advanced pain medicine training should be delivered in a designated multi-disciplinary specialist centre[s] undertaking a wide variety of pain management services spanning the full range of pain medicine treatment options/plans. Trainees are expected to spend 12 months in this dedicated advanced unit of training in addition to the time spent in intermediate and higher training, which is considered the minimum required for those aiming for a consultant appointment with sessions in pain medicine. In addition, the Faculty of Pain Medicine recommend that all those who are appointed as Lead for Acute Pain Services should have completed this advanced unit of training in pain medicine. Clinical Experience should be gained by exposure to a wide range of clinical pain medicine problems including:

- Acute pain after surgery and non-surgical acute pain
- Different types of chronic pain
- Pain and other symptoms associated with cancer
- Special patient groups including the elderly, children, those with physical disabilities, learning disabilities, communication problems, drug addiction and abuse problems

When possible, trainees are encouraged to seek opportunities to gain pain medicine training and experience in more than one centre, which must comply with the Faculty of Pain Medicine criteria [Providing Advanced training in Pain Medicine for Anaesthetists – Guide for Regional Advisers, Trainers and Trainees – available http://www.rcoa.ac.uk/index.asp?PageID=930]. A useful learning resource is the IASP Core Curriculum for Professional Education in Pain 3rd edition [2005]. Finally, trainees will keep a logbook and must successfully complete the prescribed assessment schedule of the Faculty of Pain Medicine.

Learning outcomes:

- Gain mastery in the delivery of safe and effective pain medicine care to patients with a wide variety of conditions
- Gain mastery in the management of such cases and in doing so demonstrating the necessary multi-disciplinary leadership, communication and team-working skills necessary to ensure the care delivered benefits both the patient and the organisation
- Gain maturity in understanding the importance of utilising the time allocated to clinical sessions effectively, optimising throughput whilst not compromising patient safety
- Gains the necessary maturity to guide the choice of audit cycles/quality improvement projects in developing practice
- Becomes familiar with recent developments in the practice of pain medicine, to evaluate these developments and to advise colleagues of useful changes in practice

Core clinical learning outcomes*:*

To be capable of delivering all aspects of pain medicine as an independent practitioner. This implies:

- Having a comprehensive knowledge of Pain Medicine service delivery
- Being able to assess a wide variety of patients with pain using a biopsychosocial model including, history taking, physical examination, psychological assessment

and interpretation of investigations
- Being aware of the treatment options available to provide effective management for patients with acute, chronic and cancer pain
- Becoming technically proficient in a range of procedures for Pain Medicine
- Having the communication and organisational skills to be an effective member of the multi-disciplinary Pain Medicine team
- Demonstrates empathy when caring for patients with pain
- Providing clinical leadership in the development of comprehensive pain medicine services, for the benefit of both patients and the organisation
- Acting as an effective teacher of Pain Medicine topics
- Being able to assess evidence from research related to Pain Medicine

Knowledge			
Competence	*Description*	*Assessment methods*	*GMP*
PM_AK_01	Explains the importance of epidemiology in pain medicine practice	C,E	1
PM_AK_02	Describes the principles of psychological assessment of patients with pain	A,C,E	1
PM_AK_03	Explains the doctor's contribution to Pain Management Programmes to include a cognitive behavioural approach	A,C,E	1
PM_AK_04	Describes the principles of pain management in patients with problem drug use, physiological tolerance, psychological dependence and addiction	A,C,E	1
PM_AK_05	Describes of the principles, practice and evidence for neural blockade and other interventions to treat chronic and cancer pain	A,C,E	1
PM_AK_06	Describes the principles for placement and management of implantable drug delivery pumps	A,C,E	1,2
PM_AK_07	Describes the principles and indications for spinal cord stimulation [cross reference to sub syllabus]	A,C,E	1
PM_AK_08	Explains the basic principles and indications for neurosurgical techniques in Pain Medicine	A,C,E	1
PM_AK_09	Describes the principles of Palliative Medicine	A,C,E	1
PM_AK_10	Explains the importance of medico-legal issues in Pain Medicine	A,C,E	1,3
PM_AK_11	Discusses the principles of paediatric Pain Medicine [cross reference to sub syllabus]	A,C,E	1
PM_AK_12	Discusses the role of rehabilitation services and techniques	A,C,E	1,3
PM_AK_13	Explains the importance of socio-economic, cultural and ethical issues in Pain Medicine	A,C,E	1,3
PM_AK_14	Describes the general and specific criteria for the proper development of pain medicine practice within the wider clinical and management contexts	A,C,E	1,2,3,4
PM_AK_15	Explains business management principles for pain services	A,C,E	1,3,4

PM_AK_16	Evaluates the factors influencing the organization and development of pain medicine services and is able to discuss how service development and practices can be implemented and evaluated	A,C,E	1,2,3,4
Optional sub-specialty interests. These may not be available at all training centres and every component may not be necessary for an individual			
Knowledge			
Competence	*Description*	*Assessment methods*	*GMP*
Spinal cord stimulation			
PM_AK_17	Explains the science related to SCS	C,A,E	1,2,
PM_AK_18	Describes the evidence base for SCS in different pain conditions including indications and contraindications	C,A,E	1,2
PM_AK_19	Explains the practical aspects of SCS devices and interactions with other devices/equipment	A,C,E	1,2
PM_AK_20	Explains the biopsychosocial aspects of pain that may interact with the use of SCS	A,C,E	1,2
PM_AK_21	Describes local referral pathways for patients being considered for SCS	A,C,M,E	1,2,3
Paediatric pain medicine			
PM_AK_22	Explains the developmental neurobiology of pain, including nociception, ontology of neuropathic pain and the long term consequences of pain in infancy and childhood	A,C,E	1,2
PM_AK_23	Explains the developmental, contextual and practical considerations in acute procedural and chronic pain assessment in infants, children and adolescents	A,C,E	1,2
PM_AK_24	Explains the ethical and legal aspects of prescribing for children	A,C,E	1,2
PM_AK_25	Describes the evidence-base for effective treatments for children of different ages and in different contexts	A,C,E	1,2
PM_AK_26	Explains pain pharmacotherapy in infants, children and adolescents	A,C,E	1,2
PM_AK_27	Explains the biopsychosocial aspects: the role of the family and society in children's pain	A,C,E	1,2
PM_AK_28	Describes the provision of health and educations services for children and the initiation of effective multidisciplinary working	A,C,M,E	1,2
PM_AK_29	Describes the organisational aspects of children's pain services including acute [postoperative and procedural], cancer pain and palliative medicine, and chronic pain	A,C,M,E	1,2
PM_AK_30	Explains child protection risks and procedures	A,C,E	1,2
PM_AK_31	Describes non pharmacological treatments	A,C,E	1,2
PM_AK_32	Describes common pain syndromes in childhood	A,C,E	1,2
Cancer pain			

PM_AK_33	Describes the mechanisms of pain in the cancer patient	A,C,E	1,2
PM_AK_34	Describes the complex psychosocial dynamics in cancer pain	A,C,E	1,2
PM_AK_35	Describes the principles, practice and evidence for neurolytic blockade (including autonomic, peripheral and regional techniques)	A,C,E	1,2
PM_AK_36	Describes the principles, practice and evidence for the insertion and management of external and internal implantable drug delivery systems, both peripheral and central for the management of cancer pain	A,C,E	1,2
PM_AK_37	Explains/recalls the place and limitation of spinal stabilisation techniques (vertebroplasty and kyphoplasty), percutaneous cordotomy and highly specialised techniques with the management of cancer pain	A,C,E	1,2
PM_AK_38	Describes the basic principles of chemotherapy and radiotherapy in the management of cancer pain	A,C,E	1,2
PM_AK_39	Explains the structure of the palliative care system, and its interaction with primary and secondary care	A,C,E	1,2
Intra-Thecal Drug Delivery (IDD)			
PM_AK_40	Explains the science related to IDD	A,C,E	1,2
PM_AK_41	Describes the evidence base for IDD in different pain conditions and spasticity including indications and contraindications for adults and children with cancer pain, non-cancer pain and neurological conditions	A,C,E	1,2
PM_AK_42	Describes the pharmacology of intrathecal drugs	A,C,E	1,2
PM_AK_43	Explains the practical and safety aspects of using IDD devices and interactions with other devices and equipment	A,C,E	1,2
PM_AK_44	Explains the bio-psychosocial aspects of the patient's presentation that may influence outcome from IDD and that may need to be managed to support IDD	A,C,E	1,2
PM_AK_45	Describes local referral pathways for patients being considered for IDD therapy	A,C,M,E	1,2,3

Skills			
Competence	*Description*	*Assessment methods*	*GMP*
PM_AS_01	Demonstrates comprehensive and focused assessment of patients with pain, including but not exclusively: • History taking • Physical examination • Psychological assessment • Indications for and interpretation of investigations	A,C,D,M,E	1,2,3,4
PM_AS_02	Demonstrates the ability to recognise patients with pain who have psychological problems and who require psychological evaluation, and the ability to apply established treatments for the management of psychological distress in those with pain	A,C,M,E	1,3,4

PM_AS_03	Demonstrates the ability to recognise patients with pain who require referral or support from other specialties	A,C,M,E	1,3,4
PM_AS_04	Demonstrates the safe and effective use of a comprehensive number of neural blockade procedures for pain management including cancer pain [see cancer pain additional curriculum details]	A,C,D,M,E	1,2,3,4
PM_AS_05	Demonstrates the techniques for insertion of tunnelled or implanted spinal [epidural or intrathecal] drug delivery systems	A,C,D,M,E	1,2
PM_AS_06	Demonstrates the basic practice of stimulation induced analgesia e.g TENS	A,C,D,M,E	1,2,3,4
PM_AS_07	Demonstrates the application of audit to pain medicine	A,C,M,E	1,2,3
PM_AS_08	Demonstrates the ability to undertake research in pain medicine	A,C,E	1,2,3,4
PM_AS_09	Demonstrates an understanding of responsibilities when undertaking medico-legal work	A,M,E	1,3,4
PM_AS_10	Demonstrates empathy when caring for patients with pain	A,M,E	1,4,5
PM_AS_11	Demonstrates an appreciation of the clinical boundaries of anaesthetist-led pain services in providing pain management for a wide range of patients in diverse clinical settings	A,C,M,E	1,2,4,5
PM_AS_12	Demonstrates the safe and competent use of imaging techniques during pain medicine procedures	A,D,E	1,2
PM_AS_13	Active participant in educational programmes within pain medicine	M,E	1
PM_AS_14	Active participant and presenter in departmental and multi-disciplinary team meetings as part of safe and effective pain medicine patient management	A,C,M,E	1,2,3,4
Spinal cord stimulation			
PM_AS_15	Demonstrates the ability to make an accurate assessment of pain in the context of neuromodulation	A,C,E	1,2
PM_AS_16	Demonstrates ability to work in a multidisciplinary team	A,C,E	1,2,3
PM_AS_17	Demonstrates ability to recognise complications and refer to other appropriate teams/specialists when needed	A,C,M,E	1,2,3
PM_AS_18	Demonstrates an appreciation of appropriate skills mix for multidisciplinary management in neuromodulation	A,C,M,E	1,2,3
PM_AS_19	Demonstrates effective communication with other healthcare professionals in primary and secondary care e.g. surgical specialties for assessment and treatment of complications and communication with specialist teams offering SCS therapy	A,C,M,E	1,2,3
Paediatric pain medicine			
PM_AS_20	Demonstrates accurate assessment of pain intensity in infants, children and adolescents including the premature neonate and child with neurodevelopmental delay	A,C,E	1,2
PM_AS_21	Demonstrates safe and effective pharmacological management of acute and procedural pain in all ages including the premature neonate	A,C,E	1,2,
PM_AS_22	Demonstrates an ability to lead multidisciplinary management of chronic and cancer pain in children	A,C,M,E	1.2.3.4
PM_AS_23	Demonstrates an ability to perform necessary practical procedures for safe, effective evidence based practice	A.C.D.M,E	1,2,,3

PM_AS_24	Demonstrates an ability to manage transition from paediatric to adult health and social services where appropriate	A,C,M,E	1,2,4
PM_AS_20	Demonstrates an ability to initiate and take an appropriate [including leading] role in child protection processes	A,C,M,E	1,2,4,5
PM_AS_25	Demonstrates effective communication with children and families	A,C,M,E	1,2,4
PM_AS_26	Demonstrates effective communication with other paediatric healthcare professionals	A,C,M,E	1,2,
PM_AS_27	Demonstrates effective communication and liaison with social, educational and community paediatric services	A,C,M,E	1,2,4
PM_AS_28	Demonstrates an appreciation of appropriate skills mix for multidisciplinary pain management in children of different ages , abilities and social educational needs	A,C,M,E	1,2,
PM_AS_29	Demonstrates ability to take effective leadership role in children's pain management	A,C,M,E	1,2,3
Cancer pain			
PM_AS_30	Demonstrates the ability to accurately assess pain in the cancer pain patient	A,C,E	1,2
PM_AS_31	Demonstrates the ability to work in a multi-disciplinary team	A,C,M,E	1,2,5
PM_AS_32	Demonstrates the ability to perform neurolytic blockade (including autonomic, peripheral and regional techniques) in the management of cancer pain	A,C,D,E	1,2,
PM_AS_33	Demonstrates the ability to set up and manage external and internal implantable drug delivery systems, both peripheral and central, for the management of cancer pain	A,C,D,E	1,2
PM_AS_34	Demonstrates the ability to deliver, where appropriate, some of the highly specialised treatments for the management of cancer pain, including but not exclusively, percutaneous cordotomy	A,C,D,E	1,2
PM_AS_35	Demonstrates effective communication with patients and families/carers	A,C,E	1,2,5
PM_AS_36	Demonstrates effective communication with other healthcare professionals in primary and secondary care	A,C,E	1,2,4,5
PM_AS_37	Demonstrates appreciation of the need for multi-disciplinary management in the cancer sufferer	A,C,M,E	1,2,5
Intra-Thecal Drug Delivery (IDD)			
PM_AS_38	Demonstrates an ability to make an accurate assessment of pain and spasticity on the context of IDD	A,C,E	1,2
PM_AS_39	Demonstrates an ability to work in a multidisciplinary team	A,C,M,E	1,2,3
PM_AS_40	Demonstrates ability to recognise complications and refer to other appropriate teams/specialists when needed	A,C,M,E	1,2,3
PM_AS_41	Demonstrates an appreciation of appropriate skills mix for multidisciplinary pain management in IDD service	A,C,M,E	1,2,3
PM_AS_42	Demonstrates effective communication with other healthcare professionals in primary and secondary care, including but limited to general practitioners, surgical specialties for assessment and treatment of urgent complications, neurologists and/or paediatricians for patients with spasticity and communication with other specialist teams offering IDD therapy.	A,C,M,E	1,2,3

Perioperative Medicine

This unit of training is designed to be completed over 6 to 12 months. It builds upon the competences described in the Perioperative Medicine units in Core, Intermediate and Higher training. Trainees undertaking this unit of training should be conversant with the Higher level competences.

Learning outcomes:

- To gain expertise in the clinical management of patients in the preoperative, intraoperative and both immediate and longer term postoperative periods.
- To develop the expertise to take a lead in decision making about the suitability of high risk patients for surgery.
- To develop the skills required to manage perioperative services, ensuring that the care delivered is safe and timely, benefiting both patients and the organisation.
- To provide teaching to colleagues of all grades and specialties.
- To develop local services and practice through the use of appropriate quality improvement projects.
- To ensure that perioperative services are fully integrated, consistent, and reliable and make efficient use of resources.
- To work effectively in partnership with colleagues in other disciplines, including primary care.

Knowledge			
Competence	*Description*	*Assessment Methods*	*GMP*
POM_AK_01	Demonstrates in-depth knowledge of risk models and measures of functional capacity	C	1,2
POM_AK_02	Demonstrates in-depth knowledge of preoperative optimisation of acute and chronic co-morbidity using an evidence based approach	C	1,2
POM_AK_03	Demonstrates in-depth knowledge of the benefits of integrated multidisciplinary care for high risk patients in the perioperative period	C	1,2,3
POM_AK_04	Explains the benefit of long term post-operative follow up	C	1,2,3,4

Skills

Competence	*Description*	*Assessment Methods*	*GMP*
POM_AS_05	Develops appropriate individualised perioperative plans for complex patients	A,C,L	1,2,3,4
POM_AS_06	Demonstrates excellence in critical appraisal of up to date evidence	C	1,2
POM_AS_07	Uses expertise in human factors and the culture of safe practice to enhance the quality of care and patient outcomes	A,L,S	1,2,3
POM_AS_08	Contributes to the process of developing best practice guidelines	C	1,2,3,4
POM_AS_09	Demonstrates effective multidisciplinary team-working skills	A,L,S	3
POM_AS_10	Recognises the factors associated with variations in outcomes and uses appropriate strategies to mitigate against these	A,C	1,2

Plastics/Burns

Advanced training for plastics and burns should be delivered in a designated specialist centre, with burns critical care facilities, that undertakes a wide variety of complex elective and emergency cases. It is recommended that a minimum of six months should be devoted to this unit of training. In addition to the essential Higher level units of training in adult intensive care medicine, paediatric anaesthesia and airway, the Higher trauma and regional anaesthesia units of training contain a significant number of relevant competencies and are recommended to trainees with career aspirations of the trainee within this area of practice. For those intending to have a major interest in the management of burns, Step 2 training in Intensive Care Medicine may be advisable and should be discussed early with trainers in anaesthesia and ICM and the TPD who will need to accommodate such requests into a busy programme.

Learning outcomes:

- Gain mastery in the delivery of safe and effective peri-operative anaesthetic care to patients undergoing complex burns and plastics procedures, both elective and emergency
- Gain mastery in the management of such major burns and plastics lists demonstrating the necessary multi-disciplinary leadership, communication and team-working skills necessary to ensure the care delivered benefits both the patient and the organisation
- Gains experience of admission, resuscitation & subsequent intensive care management of severely burned patients, including inhalational injuries (cross reference ICM curriculum)
- Gain maturity in understanding the importance of utilising the time allocated to clinical sessions effectively, so maximising patient throughput whilst not compromising safety
- Gains the necessary maturity to guide the choice of audit cycles/quality improvement projects in developing practice
- Becomes familiar with recent developments in peri-operative anaesthetic care to this area of practice, to evaluate these developments and to advise colleagues of useful changes in practice

Core clinical learning outcomes*:*

- To be capable of undertaking the perioperative anaesthetic care for a wide variety of complex plastics and burns cases independently; this implies an ability to:
    - Manage perioperative anaesthetic care for highly complex plastics and burns cases independently [including major reconstructive surgery] demonstrating a fundamental understanding of the problems encountered
    - Show the decision making and organizational skills required of an anaesthetist to manage busy operating sessions that involve patients having major plastics and burns surgery ensuring that the care delivered is safe and timely, benefiting both the patient and the organisation
    - To assist colleagues in decisions about the suitability of surgery in difficult situations
    - Provide teaching to less experienced colleagues of all grades

- Anaesthetise adult patients for major burns excision & grafting surgery independently

Knowledge			
Competence	*Description*	*Assessment methods*	*GMP*
PL_AK_01	Discusses, in depth, the decision making and clinical reasoning required to promote the use of safe and effective peri-operative anaesthetic care for all elective and emergency plastics & burns surgical case whilst also recognising their limitations, showing maturity in the final decision making process.	A,C,M	1,2,3,4
PL_AK_02	Demonstrates an in-depth knowledge of the clinical & organisational problems of the critical care management of the severely burned patient including but not confined to: o Admission & initial assessment on arrival in the specialist ICU o Diagnosis, initial & advanced management of inhalational injury o Management of carbon monoxide poisoning o Management of severe infection o Design requirements of a specialist burns unit [Cross reference ICM]	A,C,M	1,2,3,4

Skills			
Competence	*Description*	*Assessment methods*	*GMP*
PL_AS_01	Demonstrates maturity in the decision making, clinical reasoning and clinical leadership skills required to engage appropriately with colleagues in the multi-disciplinary team, so providing high quality, safe peri-operative anaesthetic care for a wide variety of complex elective and emergency plastics & burns surgery cases, including, but not exclusively for patients requiring: • Free – flap reconstructive surgery • Burns excision & grafting • Management of complex airway problems, particularly on commencement of anaesthesia including fibreoptic intubation techniques [Cross reference ENT and airway]	A,C,D,M	1,2,3,4
PL_AS_02	Demonstrates the ability to perform a range of local & regional anaesthetic techniques suitable for plastic surgical cases performed on the upper & lower limbs [cross reference regional anaesthesia]		

PL_AS_03	Demonstrates confidence & maturity in the intensive care management of the specific issues of the severely burned patient including but not confined to: • Initial assessment and formulation of a management plan with other members of the multi-disciplinary team on arrival in the specialist burns unit • Management of Inhalational injuries including inhaled toxins e.g. carbon monoxide poisoning • Communication with patients and relatives	A,C,D,M	1,2,3,4

Blueprint of workplace based assessments mapped against the advanced level units of training

Unit of Training	A-CEX	ALMAT	CBD	DOPS
Advanced training				
Domain 1 – Clinical practice	√	√	√	
Domain 2 – Team working		√		
Domain 3 - Leadership				
Domain 4 - Innovation				
Domain 5 - Management				
Domain 6 - Education				
Anaesthesia for neurosurgery, neuroradiology and neuro critical care	√	√	√	
Cardiothoracic anaesthesia and cardiothoracic critical care	√	√	√	
General duties				
Airway management	√			√
Head, neck, maxillo-facial and dental	√	√		
General, urological and gynaecological surgery		√		
Hepatobiliary surgery	√	√	√	
Vascular	√	√	√	
Day surgery	√	√		
Sedation and conscious sedation for dentistry	√			
Orthopaedic surgery	√	√		
Regional	√	√		√
Trauma and stabilisation	√			
Transfer	√			√
Intensive care medicine	See Annex F			
Obstetrics	√	√	√	
Paediatrics	√	√	√	√
Paediatric intensive care medicine	√		√	
Pain medicine	√		√	√
Perioperative medicine	√	√	√	
Plastic/burns	√	√	√	