Royal College of Anaesthetists

Primary FRCA Syllabus

Codes

Version 2.2
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Document control

Version History

Version	Date	Summary of changes	Domains affected	Approved / changed by
V2.2	19 Jan 2026	Updated airway management terminology; clarified paediatric age thresholds; added new GA capability on TIVA; aligned assessment terminology; refined pharmacology wording; updated regional anaesthesia descriptors; corrected item code formatting	GA, SQI, RA	RCoA
V2.0	2021	Initial publication of Primary FRCA Syllabus 2021	All	RCoA

Introduction

The purpose of this syllabus is to:

- Allow candidates to prepare for the exam by reference to what may be included in the examination questions
- Provide information for trainers, exam revision course designers etc to plan educational material/teaching resources for the examination
- Enable blueprinting of examination questions to the curriculum ensuring the validity of the examination
- Aid examinations statistical processes such as data on sampling of the curriculum.

The coding takes the following form, for example: 1_GA_Q_1

Code	Key
1	Stage of training: 1 or 2
GA	Domain: Standard abbreviation POM, GA etc
Q	Key capability (KC): Letter of KC from curriculum
1	Item: Number

Glossary of terms

ALI: Acute Lung Injury
ALS: Advanced Life Support
APLS: Advanced Paediatric Life Support
ARDS: Acute Respiratory Distress Syndrome
ASA: American Society of Anesthesiologists
ASD: Atrial septal defect
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
CO2: Carbon dioxide
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
EEG: Electroencephalogram
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
LiDCOTM: 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
PCA: Patient Controlled Analgesia
PEA: Pulseless Electrical Activity
PFO: Patent foramen ovale
PONV: Postoperative nausea and vomiting
PSI: Pounds per square inch
Ref: Reference
RS: Respiratory system
RSI: Rapid sequence induction
SpO2: Saturation of haemoglobin with oxygen
SVP: Saturated vapour pressure
TCI: Target Controlled Infusions
VSD: Ventricular septal defect
WCC: White cell count

Introduction to Anaesthetic Practice

The start of training [3-6 months]

This provides a comprehensive introduction to the principles and practices of the delivery of safe and effective anaesthetic care to patients for trainees new to the specialty. The following units of training must be completed satisfactorily:

- Perioperative medicine
    - Preoperative assessment:
        - History
        - Clinical Examination
        - Investigations
        - Specific pre-anaesthetic evaluation
    - Premedication
    - Post-operative and recovery room care
    - Perioperative management of emergency patients
- Conduct of anaesthesia
    - Induction of general anaesthesia
    - Intraoperative care
- Infection control
- Management of cardiac arrest in adults and children

The fundamental importance of developing safe clinical practice (and understanding the basic science which underpins it) means that trainees are expected to achieve ***all*** the minimum clinical learning outcomes detailed in this section ***and*** obtain the IAC before progressing to the remainder of Core Level Training. Many years of experience indicate that this will take between three and six months for most trainees.

Professional Behaviours and Communication (PBC)

1_PBC_A: Demonstrates the personal and professional values and behaviours set out in Good Medical Practice

1_PBC_A_1	Demonstrates the personal and professional values and behaviours set out in Good Medical Practice

1_PBC_B: Communicates effectively with patients, their relatives and members of the multidisciplinary team with whom they work including being open and honest when things go wrong

1_PBC_B_1	Demonstrates effective communication skills

1_PBC_C: Practices effective interpersonal skills, emphasising empathy, compassion, courtesy and respect

1_PBC_C_1	Demonstrates effective interpersonal skills

1_PBC_F: Obtains valid consent following the associated legal and professional principles

1_PBC_F_1	Legal and ethical principles for obtaining informed consent in adults; Processes for patients who are unable to consent

Management and Professional and Regulatory Requirements (MPR)

1_MPR_B: Explains employment law and the relevance of the working time regulations

1_MPR_B_1	Knowledge of employment law and its application to clinical practice

1_MPR_C: Works within local and national systems for clinical governance and data protection

1_MPR_C_1	Knowledge of principles of clinical governance and data protection

1_MPR_F: Understands equality and diversity legislation

1_MPR_F_1	Knowledge of principles of equality and diversity legislation

Team Working (TW)

1_TW_B: Demonstrates appropriate clinical leadership behaviour in the workplace

1_TW_B_1	Demonstrates effective team working

1_TW_C: Demonstrates the importance of non-technical behaviour in the functioning of a successful team

1_TW_C_1	Demonstrates effective non-technical skills

Safety and Quality Improvement (SQI)

1_SQI_A: Describes quality improvement theories and methodologies

1_SQI_A_1	Knowledge of system of profound knowledge (SOPK) and model for improvement

1_SQI_C: Compares audit, research and quality improvement

1_SQI_C_1	Describes the different role for data for audit, research and quality improvement

1_SQI_E: Describes the common threats to patient safety in theatre and the perioperative period, and describes how these are minimised by day-to-day work routines

1_SQI_E_1	Factors that contribute to drug errors in anaesthesia and strategies to reduce them

1_SQI_H: Demonstrates the importance of the non-technical aspects of care such as situation awareness, task management, decision making and team working in anaesthetic practice.

1_SQI_H_1	Demonstration of satisfactory non-technical skills in clinical performance exam

1_SQI_K: Describes the requirements and processes for raising concerns

1_SQI_K_1	Knowledge of how to raise concerns in the NHS

1_SQI_L: Explains and demonstrates duty of candour

1_SQI_L_1	Demonstration of the principles of the GMC's Professional Duty of Candour

1_SQI_M: Prescribes and administers drugs safely

1_SQI_M_1	Demonstrates safe prescribing practice

Safeguarding (SG)

1_SG_A: Explains local procedures for safeguarding vulnerable children and adults

1_SG_A_1	Knowledge of child protection regulations and what action must be taken when non-accidental injury is suspected

1_SG_B: Discusses the principles of adult safeguarding; empowerment, prevention, proportionality, protection, partnership, accountability

1_SG_B_1	Knowledge of principles of adult safeguarding

1_SG_F: Complies with professional requirements and legal processes when obtaining consent from vulnerable patients

1_SG_F_1	Legal and ethical considerations for determining mental capacity

Research and Managing Data (RD)

1_RD_E: Describes essential statistical techniques used in research

1_RD_E_1	Principles of study design
1_RD_E_2	Outcome measures and the uncertainty in their definition
1_RD_E_3	Principles of meta-analysis and evidence based medicine
1_RD_E_4	Types of data and their representation
1_RD_E_5	The normal distribution and other examples of parametric distributions
1_RD_E_6	Descriptive statistics of central tendency and variability
1_RD_E_7	Basic probability theory and the relationship to confidence values
1_RD_E_8	The null hypothesis
1_RD_E_9	Simple statistical tests for different types of data
1_RD_E_10	Type I and type II errors

Perioperative Medicine and Health Promotion

1_POM_A: Explains the patient, anaesthetic and surgical factors influencing patient outcomes

1_POM_A_1	Integrated perioperative care pathways in primary and secondary care and patient outcomes
1_POM_A_2	Organisational interventions which improve patient outcomes (eg care bundles, enhanced recovery programmes)
1_POM_A_3	Effects of acute and chronic disease on patient outcomes after surgery
1_POM_A_4	Implications of lifestyle factors such as smoking, alcohol intake and substance abuse on patient outcomes

1_POM_B: Applies a structured approach to preoperative anaesthetic assessment of ASA 1-3 patients prior to surgery and recognises when further assessment and optimisation is required

1_POM_B_1	Understands and explains the appropriate role of other specialties in preoperative optimisation
1_POM_B_2	Preoperative investigations including indications for specific tests
1_POM_B_3	Interprets common preoperative investigations
1_POM_B_4	Risk assessment and stratification relevant to the provision of perioperative care
1_POM_B_5	Emergency surgery vs elective surgery in terms of physiology, psychology and preparation
1_POM_B_6	ASA and NCEPOD classifications; their implications in preparing for and planning anaesthesia and postoperative care
1_POM_B_7	Implications of common co-existing diseases on anaesthesia and surgery including but not exclusively: obesity, diabetes, asthma, ischaemic heart disease, hypertension, rheumatoid disease, epilepsy

1_POM_C: Explains the effect that co-existing disease, subsequent treatment and surgical procedures may have on the conduct of anaesthesia and plans perioperative management accordingly

1_POM_C_1	Relevance of comorbid disease when planning and in the safe conduct of anaesthesia
1_POM_C_2	Patient optimisation and risk reduction in the perioperative period
1_POM_C_3	Management of drug therapy for co-existing disease in the perioperative period including, but not exclusively, diabetic treatment, steroids, anticoagulants, cardiovascular and respiratory medication, anti-convulsants
1_POM_C_4	Current guidance on early surgical management of hip fractures and the necessary assessment for anaesthesia, timing of surgery and reasons for delay
1_POM_C_5	Pathophysiology of obstructive sleep apnoea and its relevance to anaesthesia

1_POM_D: Explains individualises options and risks of anaesthesia and pain management to patients

1_POM_D_1	Synthesises relevant information to develop a safe anaesthetic plan taking the patient's wishes into consideration

1_POM_E: Describes the importance of perioperative nutrition and fasting

1_POM_E_1	Nutritional status on patient outcomes
1_POM_E_2	Perioperative fluid and feeding regimes
1_POM_E_3	Indications for preoperative fasting and appropriate regimens

1_POM_F: Recognises and acts on the specific perioperative care requirements in frail and elderly patients and those with cognitive impairment

1_POM_F_1	Anaesthetic implications for the following patient groups: the elderly, pregnant women, patients with cognitive impairment, patients with chronic pain and recreational drug users

1_POM_G: Considers patient informed preference when obtaining consent for anaesthetic procedures

1_POM_G_1	Principles of consent for surgery and anaesthesia, including the issue of capacity
1_POM_G_2	Explains the guidance given by the GMC on consent, in particular: Understands that consent is a process that may culminate in, but is not limited to, the completion of a consent form Understands the particular importance of considering the patient's level of understanding and mental state [and also that of the parents, relatives or carers when appropriate] and how this may impair their capacity for consent

1_POM_H: Describes and recognises the role of socio-economic, environmental and lifestyle factors in health and illness

1_POM_H_1	Demonstrates understanding of the relevance of socio-economic, environmental and lifestyle factors on outcomes from surgery

1_POM_J: Describes and utilises appropriate antibiotic prophylaxis and prevention and treatment of infections

1_POM_J_1	Types of hospital acquired infections and the precautions needed to reduce their transmission including prions
1_POM_J_2	Concept of cross infection including: • Modes of cross infection • Common cross infection agents
1_POM_J_3	Explains the need for antibiotic policies in hospitals
1_POM_J_4	The causes, prevention and treatment of infections seen in surgical, critically ill and immunocompromised patients
1_POM_J_5	Discusses the need for, and application of, hospital immunisation policies
1_POM_J_6	Principles and practice in using prophylactic antibiotics
1_POM_J_7	Explains the principles and philosophy of antibiotic stewardship

1_POM_K: Explains the environmental impact of healthcare and the principles of sustainable clinical practice

1_POM_K_1	Demonstrates understanding of the environmental impact of anaesthesia

1_POM_L: Applies local policies to prevent venous thromboembolism and understands the implications for anaesthetic practice on an individualised basis

1_POM_L_1	Thromboprophylaxis in the perioperative period
1_POM_L_2	Prevention of thromboembolic disease following surgery
1_POM_L_3	Local/national guidelines on management of thrombo-embolic risk

1_POM_M: Explains the specific perioperative care requirements of children including anxiety management

1_POM_M_1	Knowledge of premedication for children

1_POM_N: Explains the perioperative implications of pregnancy and initiates management of common serious diseases related to pregnancy

1_POM_N_1	Understanding of the management of pregnancy related hypertension including pre-eclampsia

1_POM_P: Describes the perioperative requirements for day surgery

1_POM_P_1	Assesses patient suitability for day case admission
1_POM_P_2	Factors determining suitability for treatment as an ambulant or day-stay patient
1_POM_P_3	Principles of preoperative assessment and investigation of patients requiring day surgery including nurse-led assessment

1_POM_P_4	Describes protocols for selection of day surgery patients including medical, surgical and social factors
1_POM_P_5	Postoperative care specific to day case including discharge criteria, transport arrangements and when to drive
1_POM_P_6	Causes of unanticipated in-patient admission following day surgery

1_POM_Q: Safely prescribes and administers blood products

1_POM_Q_1	Infections transmitted through contaminated blood including but not limited to: HIV, Hepatitis B and C
1_POM_Q_2	Understanding of methods of safe transfusion of blood and blood products

General Anaesthesia (GA)

1_GA_A: Conducts comprehensive pre-anaesthetic and pre-operative checks

1_GA_A_1	Describes the need for a targeted and relevant clinical examination
1_GA_A_2	Describes the basis for clinical signs and the relevance of positive and negative physical signs
1_GA_A_3	Anaesthetic history taking
1_GA_A_4	Recognises that patients do not always present history in a structured fashion
1_GA_A_5	Lists the likely causes and risk factors for conditions relevant to mode of presentation
1_GA_A_6	Uses the patient's agenda and history to inform examination, investigation and management
1_GA_A_7	Indications for rapid sequence induction
1_GA_A_8	Specific complications of anaesthetic drugs including anaphylaxis, suxamethonium apnoea and malignant hyperpyrexia; prediction of patients who are at increased risk of these complications
1_GA_A_9	Risk factors for post-operative nausea and vomiting
1_GA_A_10	Obtains a history specifically relevant to the planned anaesthesia and surgery including: A history of the presenting complaint for surgery A systematic comprehensive relevant medical history Information about current and past medication Drug allergy and intolerance Information about previous anaesthetics and relevant family history
1_GA_A_11	Performs a relevant clinical examination including when appropriate: Cardiovascular system Respiratory system Central and peripheral nervous system Airway assessment
1_GA_A_12	Factors that influence the risk of gastric reflux/aspiration and strategies to reduce it

1_GA_B: Safely manages induction and maintenance of anaesthesia by inhalational and intravenous techniques, extubation and emergence from anaesthesia

1_GA_B_1	Gives examples of methods of anaesthesia that are suitable for common operations.
1_GA_B_2	Indications for pre-medication
1_GA_B_3	Makes appropriate plans for anaesthesia: Reviews current medication and seeks advice where appropriate Plans appropriate anaesthetic technique[s] Secures consent for anaesthesia Recognises the need for additional investigation and acts accordingly Discusses issues of concern with relevant members of the team
1_GA_B_4	Explains the importance of maintaining the principles of aseptic practice and minimising the risks of hospital acquired infection
1_GA_B_5	Principles of management of the airway including maintenance of a clear airway and the use of airway adjuncts and supraglottic airway devices
1_GA_B_6	Advantages and disadvantages of intubation and supraglottic airway devices for airway management during anaesthesia
1_GA_B_7	Different types of supraglottic devices
1_GA_B_8	Indications for tracheal intubation: Types of tracheal tube and identifies their applications Choice of the correct size and length of tracheal tube Advantages/disadvantages of different types of laryngoscopes and blades including, but not exclusively, the Macintosh and McCoy and videolaryngoscope Confirmation of correct placement of a tracheal tube; identification and complications of endobronchial or oesophageal intubation Confirmation of correct placement of a tracheal tube; identification and complications of endobronchial or oesophageal intubation Management of difficult intubation and failed intubation Identification of patients who are at increased risk of regurgitation and pulmonary aspiration; measures that minimise the risk
1_GA_B_9	Rapid sequence induction of anaesthesia
1_GA_B_10	Indication and techniques for fibre-optic intubation
1_GA_B_11	Problems associated with limb tourniquets and their safe use
1_GA_B_12	Hazards associated with positioning – supine, lateral, prone, sitting
1_GA_B_13	Anaesthesia for surgery in the prone and lateral positions
1_GA_B_14	Blood conservation in major surgery
1_GA_B_15	Surgical procedures for managing hip fractures, the anaesthetic requirements for each and the current evidence for the choice of anaesthetic technique
1_GA_B_16	Pathophysiology, diagnosis and management of specific orthopaedic surgical complications that are relevant to anaesthesia including but not exclusively • Bone cement Implantation Syndrome • Diagnosis and management of fat embolism • Upper and lower limb compartment syndrome

1_GA_B_17	Anaesthetic techniques appropriate for day cases including appropriate drugs
1_GA_B_18	Pre-oxygenation, effects, limitations and correct techniques for its use
1_GA_B_19	Intravenous and inhalational induction; techniques, advantages and disadvantages of both
1_GA_B_20	Factors influencing the choice of agent for inhalational or intravenous induction of anaesthesia
1_GA_B_21	Non anaesthetic physiological effects of intravenous and inhalational induction
1_GA_B_22	Identifies the special problems of induction associated with cardiac disease, respiratory disease, musculoskeletal disease, obesity and those at risk of regurgitation/pulmonary aspiration
1_GA_B_23	Removal of tracheal tubes and supraglottic airway devices and associated complications
1_GA_B_24	Tracheal extubation strategies and management of laryngospasm at extubation
1_GA_B_25	Physical and physiological effects of laparoscopic surgery including the effects of positioning (eg Trendelenberg, reverse Trendelenberg)

1_GA_C: Plans recovery care, and manages recovery from anaesthesia utilising safe discharge criteria

1_GA_C_1	Indications for, contra-indications to and complications of oxygen therapy in the post-operative period
1_GA_C_2	Techniques for administration of oxygen therapy and performance characteristics of available devices
1_GA_C_3	Identification and management of respiratory complications seen in recovery
1_GA_C_4	Identification and management of cardiovascular complications seen in recovery
1_GA_C_5	Identification and management of other common complications seen in recovery
1_GA_C_6	Monitoring and the frequency of observations required for patients having undergone different types of surgery
1_GA_C_7	Care of an unconscious patient in the recovery room, including safe positioning
1_GA_C_8	Patient factors possibly requiring higher levels (level 2 or 3) of care in the postoperative period

1_GA_C_9	Lists the appropriate discharge criteria for patients leaving the recovery room and for day stay patients
1_GA_C_10	Explains the importance of following up patients in the ward after surgery
1_GA_C_11	Principles of postoperative fluid regimes including volumes, types of fluid and monitoring of fluid balance

1_GA_D: Diagnoses and manages common peri-operative complications

1_GA_D_1	Contribution of PONV to post-operative outcomes and satisfaction
1_GA_D_2	Predisposing factors for PONV
1_GA_D_3	Regimes for prevention and treatment of PONV
1_GA_D_4	Recognition and management of incomplete reversal of neuromuscular blockade
1_GA_D_5	Causes and management of postoperative confusion
1_GA_D_6	Causes and management of postoperative hypo and hypertension
1_GA_D_7	Prevention, diagnosis and management of postoperative pulmonary atelectasis
1_GA_D_8	Causes and management of stridor
1_GA_D_9	Signs of pulmonary aspiration and its emergency management

1_GA_E: Recognises anaesthetic critical incidents and explains their causes and management

1_GA_E_1	Unexpected fall in SpO2
1_GA_E_2	Unexpected increase in peak airway pressure
1_GA_E_3	Progressive fall in minute volume during spontaneous respiration or IPPV
1_GA_E_4	Fall in end tidal CO_2
1_GA_E_5	Rise in end tidal CO_2
1_GA_E_6	Rise in inspired CO_2
1_GA_E_7	Unexpected hypotension
1_GA_E_8	Unexpected hypertension
1_GA_E_9	Arrythmias
1_GA_E_10	Convulsions
1_GA_E_11	Regurgitation or aspiration of stomach contents

1_GA_E_12	Laryngospasm
1_GA_E_13	Difficulty with IPPV, sudden or progressive loss of minute volume
1_GA_E_14	Bronchospasm
1_GA_E_15	Pneumothorax and tension pneumothorax
1_GA_E_16	Gas, fat and pulmonary embolism
1_GA_E_17	Adverse drug reactions
1_GA_E_18	Anaphylactic reactions and the appropriate management including follow up and patient information
1_GA_E_19	Transfusion reactions (major and minor), management of inadvertent transfusion of mis-matched blood or blood products
1_GA_E_20	Inadvertent intra-arterial injection of irritant fluids
1_GA_E_21	High or total spinal block
1_GA_E_22	Local anaesthetic toxicity
1_GA_E_23	Accidental decannulation of tracheostomy or tracheal tube
1_GA_E_24	Brain stem herniation due to increased intracranial pressure
1_GA_E_25	Malignant hyperpyrexia
1_GA_E_26	Awareness of the importance of critical incident reporting
1_GA_E_27	The provision of information to the patient and where necessary ensuring that they get the appropriate counselling and advice with appropriate supervision
1_GA_E_28	The need to follow through a critical incident with proper reporting, presentation at morbidity meetings and warning flags as necessary

1_GA_F: Demonstrates knowledge of standard equipment used in anaesthetic practice with an understanding of relevant underpinning physics and clinical measurement involved

F1: Equipment

1_GA_F1_1	The functions and safety features of the anaesthetic machine
1_GA_F1_2	Patient warming systems: principles
1_GA_F1_3	Warming equipment for intravenous fluids: principles
1_GA_F1_4	Storage of gases and vapours including safety
1_GA_F1_5	Suction devices
1_GA_F1_6	Scavenging devices

1_GA_F1_7	Cylinders and pipelines, Bourdon gauge
1_GA_F1_8	Vaporisers: principles including plenum and draw over, temperature compensation, calibration
1_GA_F1_9	Electrical hazards: causes and prevention
1_GA_F1_10	Electrocution: including microshock, earth faults, leakage
1_GA_F1_11	Electrical equipment safety: medical, classification, types of equipment, symbols
1_GA_F1_12	ECG: principles including electrodes and electrode placement
1_GA_F1_13	Lasers: basic principles and safety
1_GA_F1_14	Cardiac pacemakers: Classification and safety
1_GA_F1_15	Defibrillators and defibrillation: principles including thoracic impedance, implantable devices
1_GA_F1_16	Diathermy: monopolar, bipolar; safety and uses
1_GA_F1_17	Plenum systems: warming blankets, theatre and anaesthetic room ventilation
1_GA_F1_18	Breathing systems: Mapleson classification, coaxial systems, circle systems, Tpiece, resuscitation breathing devices
1_GA_F1_19	Ventilators: principles including pressure and flow generators, cycling, jet and oscillator ventilators
1_GA_F1_20	Disconnections: monitoring of ventilator disconnection, warning devices
1_GA_F1_21	Fires and explosions: risks and prevention
1_GA_F1_22	Infusion pumps and syringe drivers; PCA devices, epidural infusion devices. Principles, use, safety and relevant drug calculations
1_GA_F1_23	Principles of hygiene including disinfection and sterilisation of equipment
1_GA_F1_24	Methods of decontamination, disinfection and sterilisation
1_GA_F1_25	Describes the benefits and limitations of technology and equipment in maintaining patient safety

F2: Physics

1_GA_F2_1	SI units: fundamental and derived units
1_GA_F2_2	SI and non SI units relevant to anaesthesia including mmHg, bar, atmospheres, cm H_2O, PSI

1_GA_F2_3	Simple mechanics: mass, force, work, energy, power where these are relevant to anaesthetic practice
1_GA_F2_4	Heat: including temperature, absolute zero
1_GA_F2_5	Heat transfer and loss with relevance to clinical anaesthesia: conduction, convection, radiation and evaporation
1_GA_F2_6	Latent heat
1_GA_F2_7	Colligative properties: relevance of the concepts of osmolarity, osmolality and diffusion to anaesthetic practice
1_GA_F2_8	Physics of gases. Gas laws: kinetic theory of gases, Boyle's, Henry's, Dalton's, Charles' and Gay-Lussac's
1_GA_F2_9	Critical temperature and pressure
1_GA_F2_10	Physics of vapours
1_GA_F2_11	Pressure; absolute and relative pressure, gauge pressure
1_GA_F2_12	Principles of laminar and turbulent flow; Hagen-Poiseuille equation, Reynold's number
1_GA_F2_13	Relevance of gas density and viscosity. Examples including helium
1_GA_F2_14	Bernoulli principle
1_GA_F2_15	Venturi effect and entrainment devices
1_GA_F2_16	Vapour pressure; saturated vapour pressure
1_GA_F2_17	Vaporisation; process of vaporisation
1_GA_F2_18	Principles of surface tension
1_GA_F2_19	Capacitance, inductance
1_GA_F2_20	Ultrasound: basic principles of ultrasound
1_GA_F2_21	Physics relevant to optical fibres
1_GA_F2_22	Doppler effect: principle and clinical application
1_GA_F2_23	Resonance, damping, frequency response and their relevance to monitoring systems used in anaesthetic practice

F3: Clinical measurement

1_GA_F3_1	Basic measurement concepts relevant to understanding of monitoring in anaesthesia: linearity, drift, hysteresis, signal to noise ratio, static and dynamic response

1_GA_F3_2	Temperature measurement including mercury, alcohol, infrared, thermistor, thermocouple, Bourdon gauge, liquid crystal
1_GA_F3_3	Anatomical sites used for temperature measurement
1_GA_F3_4	Measurement of lung volumes and diffusion
1_GA_F3_5	Measurement of volume and flow in gases and liquids including pneumotachograph and other respirometers
1_GA_F3_6	Electrical interference; souces, methods of reduction
1_GA_F3_7	Pressure transducers
1_GA_F3_8	Capnography
1_GA_F3_9	Pulse oximetry
1_GA_F3_10	Measurement of gas pressures
1_GA_F3_11	Blood pressure: direct and indirect measurement including complications
1_GA_F3_12	Cardiac output: principles of measurement
1_GA_F3_13	Principles of measurement of pH, PCO_2, PO_2, electrolytes
1_GA_F3_14	Derived blood gas variables eg bicarbonate measures, base excess, oxygen consumption, respiratory quotient
1_GA_F3_15	Measurement of gas and vapour concentrations; including infrared, paramagnetic, fuel cell, oxygen electrode, mass spectrometry
1_GA_F3_16	Simple tests of pulmonary function: peak flow rate, spirometry
1_GA_F3_17	Assessment of neuromuscular blockade; quantitative and qualitative
1_GA_F3_18	Environmental monitoring; contamination by anaesthetic gases and vapours
1_GA_F3_19	Basic function and purpose of monitors
1_GA_F3_20	Minimum monitoring standards and indications for additional monitoring
1_GA_F3_21	Principles of calibration of monitoring equipment
1_GA_F3_22	Understanding the limits of monitoring equipment
1_GA_F3_23	CO_2 absorption: chemistry and complications
1_GA_F3_24	Principles of measurement of parameters such as haemoglobin, blood glucose and coagulation using near-patient testing devices

1_GA_G: Demonstrates knowledge of anatomy, physiology, biochemistry and pharmacology relevant to anaesthetic practice

G1: Anatomy

1_GA_G1_1	Mouth, nose, pharynx, larynx, trachea, main bronchi, segmental bronchi, structure of the bronchial tree; age related changes from the neonate to the adult
1_GA_G1_2	Airway/respiratory tract blood supply and innervation
1_GA_G1_3	Pleura, including surface anatomy, mediastinum and its contents
1_GA_G1_4	Lungs: lobes and microstructure of lungs
1_GA_G1_5	Diaphragm, other muscles of respiration including innervation
1_GA_G1_6	The thoracic inlet and first rib; interpretation of the normal adult chest X ray
1_GA_G1_7	Heart: chambers, valves, conducting system and pericardium, blood supply and innervation
1_GA_G1_8	Great vessels, main peripheral arteries and veins
1_GA_G1_9	Brain and its subdivisions; blood supply
1_GA_G1_10	Spinal cord, structure of spinal cord, major ascending and descending pathways and blood supply
1_GA_G1_11	Anatomical organisation of pain and sensory pathways from the periphery to the central nervous system
1_GA_G1_12	Pain pathways relevant to the stages of obstetric labour and delivery
1_GA_G1_13	Spinal meninges, subarachnoid and extradural space, contents of extradural space
1_GA_G1_14	Anatomy of CSF system
1_GA_G1_15	Spinal nerves; dermatomes and applied knowledge of dermatomes in regional anaesthesia
1_GA_G1_16	Brachial plexus; nerves of the upper limb
1_GA_G1_17	Intercostal nerves
1_GA_G1_18	Nerves of the abdominal wall including innervation of the inguinal region
1_GA_G1_19	Lumbar and sacral plexuses; nerves of the lower limb
1_GA_G1_20	Anatomical organisation of the autonomic nervous system
1_GA_G1_21	Sympathetic innervation, sympathetic chain, ganglia and plexuses
1_GA_G1_22	Parasympathetic innervation; cranial and sacral outflow
1_GA_G1_23	Stellate ganglion

1_GA_G1_24	Cranial nerves
1_GA_G1_25	Innervation of the pharynx and larynx
1_GA_G1_26	Eye and orbit
1_GA_G1_27	Functional anatomy of the hypothalamic/pituitary system
1_GA_G1_28	Functional anatomy of the adrenal gland
1_GA_G1_29	Functional anatomy of the thyroid and parathyroid glands
1_GA_G1_30	Cervical, thoracic and lumbar vertebrae
1_GA_G1_31	Sacrum, sacral hiatus
1_GA_G1_32	Ligaments of the vertebral column where relevant to anaesthetic practice
1_GA_G1_33	Surface anatomy of vertebral spaces; length of the spinal cord and subarachnoid space, age related differences from the neonate to the adult
1_GA_G1_34	Structures in the antecubital fossa
1_GA_G1_35	Structures in the axilla
1_GA_G1_36	Large veins of the neck. Anterior triangle of the neck: surface anatomy and ultrasound demonstrated anatomy relevant to insertion of central venous cannulae
1_GA_G1_37	Large veins of the leg; femoral triangle
1_GA_G1_38	Arteries of upper and lower limbs
1_GA_G1_39	Landmarks for performance of cricoid pressure and surgical airway procedures
1_GA_G1_40	Landmarks for the insertion of intercostal drainage catheters and needle decompression of pneumothorax

G2: Physiology

1_GA_G2_1	Organisation of the human body and the control of the internal environment
1_GA_G2_2	Changes with advancing age
1_GA_G2_3	Cells: components and organelles
1_GA_G2_4	Function of cells: genes and their expression
1_GA_G2_5	Cell membrane characteristics; cell junctions, receptors
1_GA_G2_6	Protective mechanisms of the body

1_GA_G2_7	Definition of pH, strong and weak acids
1_GA_G2_8	Acid base balance; buffers, Henderson Hasselbach equation and anion gap

1_GA_G2_9	Ions eg Na^+, K^+, Mg^{2+}, Ca^{2+}, Cl^-, HCO_3^-
1_GA_G2_10	Cellular metabolism; aerobic vs anaerobic
1_GA_G2_11	Fetus: physiological changes at birth
1_GA_G2_12	Enzymes
1_GA_G2_13	Capillary dynamics and interstitial fluid; osmosis, filtration and convection
1_GA_G2_14	Osmolarity; osmolality, partition of fluids across membranes, tonicity
1_GA_G2_15	Lymphatic system
1_GA_G2_16	Special fluids: CSF, pleural, pericardial, peritoneal
1_GA_G2_17	Active cellular transport mechanisms
1_GA_G2_18	Blood: physical properties, components, functions
1_GA_G2_19	Red blood cells: production and turnover, haematinics, haemoglobin and its variant including abnormal haemoglobins
1_GA_G2_20	Anaemia; acute and chronic adaptations, iron absorption, transportation and metabolism
1_GA_G2_21	Polycythaemia: causes and implications
1_GA_G2_22	Blood groups: ABO, Rhesus, others
1_GA_G2_23	Transfusion reactions; Rhesus incompatibility
1_GA_G2_24	Haemostasis and coagulation, fibrinolysis. Abnormalities, congenital and acquired
1_GA_G2_25	Alternative oxygen carrying solutions
1_GA_G2_26	White blood cells: types, origins, characteristics, turnover

1_GA_G2_27	The inflammatory response, systemic inflammatory responses, hypersensitivity reactions. Immunity and allergy: innate vs acquired, non-specific vs specific, humoral vs cellular. Immunodeficiency – congenital and acquired
1_GA_G2_28	Action potential generation and transmission
1_GA_G2_29	Neuromuscular junction and transmission, motor end-plate
1_GA_G2_30	Disturbances of neuromuscular transmission
1_GA_G2_31	Myopathies, congenital and acquired
1_GA_G2_32	Muscle contracture: malignant hyperthermia, myoclonus, burns
1_GA_G2_33	Muscle types: skeletal, smooth, cardiac
1_GA_G2_34	Skeletal muscle excitation-contraction coupling
1_GA_G2_35	Smooth muscle contraction; sphincters
1_GA_G2_36	Motor unit concept
1_GA_G2_37	Cardiac muscle contraction
1_GA_G2_38	Cardiac cycle: pressure volume relationships, work and power

1_GA_G2_39	Rhythmicity of the heart; cardiac impulse generation
1_GA_G2_40	Regulation of cardiac function; general and cellular
1_GA_G2_41	Control of cardiac output; Starling relationship
1_GA_G2_42	Fluid challenge and heart failure, types of shock
1_GA_G2_43	Electrocardiogram and arrhythmias, origin of ECG, effects of temperature, ischaemia, infarction and electrolyte imbalance
1_GA_G2_44	Neurological and humoral control of systemic blood pressure, blood volume and blood flow; at rest and during physiological disturbance eg exercise, haemorrhage and Valsalva manoeuvre
1_GA_G2_45	Peripheral circulation: capillaries, vascular endothelium and arteriolar smooth muscle
1_GA_G2_46	Functions of endothelium

1_GA_G2_47	Characteristics of special circulations including pulmonary, coronary, cerebral, renal, portal, transitional and fetal
1_GA_G2_48	Structure and function of renal circulation
1_GA_G2_49	Blood flow and glomerular filtration, plasma clearance and tubule-glomerular feedback
1_GA_G2_50	Tubular function and urine formation; transport processes in kidney
1_GA_G2_51	Assessment of renal function
1_GA_G2_52	Regulation of water and electrolyte balance; response to fluid loss/hypovolaemia
1_GA_G2_53	Role of urea and creatinine measurement
1_GA_G2_54	Regulation of acid-base balance
1_GA_G2_55	Pathophysiology of acute kidney injury and renal failure
1_GA_G2_56	Gaseous exchange: O_2 and CO_2 transport, hypoxia and hyper/hypocapnia, hyper and hypobaric pressures
1_GA_G2_57	Function of haemoglobin in oxygen carriage and acid-base equilibrium
1_GA_G2_58	Pulmonary ventilation: volumes, capacities, flows, dead space, compliance, work of breathing
1_GA_G2_59	Effect of IPPV on lungs
1_GA_G2_60	Mechanics of ventilation; ventilation/perfusion abnormalities, regional V/Q, surfactant
1_GA_G2_61	Control of breathing, acute and chronic ventilator failure, effect of oxygen therapy
1_GA_G2_62	Effects of altitude
1_GA_G2_63	Non-respiratory functions of the lungs

1_GA_G2_64	Neuronal structure and function, resting membrane potential, action potentials, conduction, synaptic mechanisms, actions of neurotransmitters
1_GA_G2_65	The brain; functional divisions
1_GA_G2_66	Brain stem: organisation, interconnections. Intracranial pressure, CSF and blood flow
1_GA_G2_67	Autonomic nervous system: organisation, ganglia, adrenergic vs cholinergic
1_GA_G2_68	Neurological reflexes: monosynaptic, polysynaptic, stretch, inhibition

1_GA_G2_69	Motor function: basal ganglia, spinal and peripheral Sense: receptors, nociception, proprioception, sight, taste, smell, hearing, balance, touch, temperature
1_GA_G2_70	Pain: afferent nociceptive pathways, dorsal horn, peripheral and central mechanisms, neuromodulatory systems, supraspinal mechanisms, visceral pain, neuropathic pain, influence of therapy on nociceptive mechanisms
1_GA_G2_71	Physiology of nausea and vomiting
1_GA_G2_72	Metabolic and digestive functions
1_GA_G2_73	Gastric function: motility, secretions, nausea and vomiting
1_GA_G2_74	Digestive functions: composition of secretions, digestion of carbohydrates, lipids, proteins. Energy homeostasis
1_GA_G2_75	Body mass/composition. Body mass index, body fat estimation
1_GA_G2_76	Principles of nutrition: carbohydrates, fats, proteins, vitamins and minerals
1_GA_G2_77	Energy requirements/expenditure and measurement
1_GA_G2_78	Metabolic pathways, energy production and enzymes, metabolic rate, lactate metabolism
1_GA_G2_79	Hormonal control of metabolism: regulation of plasma glucose, response to trauma
1_GA_G2_80	Physiological alterations in starvation, exercise and the stress response
1_GA_G2_81	Body temperature and its regulation including at extremes of age
1_GA_G2_82	Hormones: types, receptors, hierarchy, extracellular signalling
1_GA_G2_83	Mechanisms of hormonal control: feedback mechanisms, effects on membrane and intracellular receptors
1_GA_G2_84	Hypothalamic and pituitary function
1_GA_G2_85	Adrenocortical hormones
1_GA_G2_86	Adrenal medulla: adrenaline and noradrenaline
1_GA_G2_87	Pancreas: insulin, glucagons and exocrine function
1_GA_G2_88	Thyroid and parathyroid hormones and calcium homeostasis
1_GA_G2_89	Physiological changes associated with pregnancy
1_GA_G2_90	Materno-fetal, fetal and neonatal circulation
1_GA_G2_91	Functions of the placenta; placental transfer

G3: Biochemistry and pharmacology

1_GA_G3_1	Exponential functions including wash-in, wash-out where relevant to anaesthetic practice
1_GA_G3_2	Logarithms relevant to anaesthetic or critical care practice
1_GA_G3_3	Area under the curve (integration) and rate of change (differentiation) relevant to anaesthetic practice
1_GA_G3_4	Organic chemistry: drugs as organic molecules, types of intermolecular bonds, interactions between molecules, organic compared with inorganic compounds, bond strength, important atomic constituents, C, N, O, P, S and halides
1_GA_G3_5	Organic chemistry: ionisation of molecules, types of group that ionise, amides, hydroxyl, carboxyl
1_GA_G3_6	Oxidation and reduction
1_GA_G3_7	Permanently charged (quaternary ammonium) drugs
1_GA_G3_8	Drug chemistry: solubility, partition coefficients and movement of drugs through membranes, lipid solubility, influence of pKa and pH
1_GA_G3_9	Passive and active transport mechanisms
1_GA_G3_10	Isomers: structural and stereo, classification systems, clinical relevance
1_GA_G3_11	Mechanisms of drug action: physicochemical, pharmacodynamics, pharmacokinetic, drug-receptor interactions, dose response and log doseresponse curves, agonists, partial agonists, antagonists
1_GA_G3_12	Reversible and irreversible antagonism. Potency and efficacy
1_GA_G3_13	Non-specific drug actions; physic chemical mechanisms eg adsorption, chelation, neutralisation
1_GA_G3_14	Voltage-gated ion channels, membrane bound transport pumps
1_GA_G3_15	Sodium, potassium and calcium channels as targets for drug action
1_GA_G3_16	Receptors as proteins, ion channels, transmembrane transduction and intermediate messenger systems, intracellular/nuclear receptors
1_GA_G3_17	Receptor regulation and tachyphylaxis
1_GA_G3_18	Response time of ligand gated receptor interaction, enzymes as drug targets, Michaelis-Menten kinetics
1_GA_G3_19	Direct and allosteric mechanisms eg acetylcholinesterase, cyclo-oxygenase, phosphodiesterase

1_GA_G3_20	Anticholinesterases; classification of drugs that inhibit acetylcholinesterase and plasma cholinesterase including organophosphates

1_GA_G3_21	Predictable side effects of drugs, non selective actions of drugs, action at multiple receptors, multiple anatomical locations, predictable enzyme induction/inhibition
1_GA_G3_22	Idiosyncratic side effects of drugs eg blood and bone marrow dyscrasias, pulmonary fibrosis, antiplatelet effects
1_GA_G3_23	Anaphylactic and anaphylactoid reactions; comparison, treatment, identification of responsible drug, risks of polypharmacy
1_GA_G3_24	Tachyphylaxis and tolerance; examples of drugs demonstrating tachyphylaxis, proposed mechanisms
1_GA_G3_25	Drug interactions: types of interaction, synergism, additivity, antagonism, isobolograms
1_GA_G3_26	Classification of mechanisms of drug interactions
1_GA_G3_27	Pharmacokinetics: general principles – absorption, distribution and redistribution, elimination, excretion. Chemical properties of drugs and their pharmacokinetics. Blood-brain barrier and placental barrier. Protein binding – plasma and tissue. Body compartments, adipose and vessel poor tissue. Bioavailability, clearance
1_GA_G3_28	Administration and absorption; routes of administration; first pass metabolism and bioavailability. Selection of appropriate route. Drug delivery systems eg sustained release, enteric coated, transdermal patch and iontophoretic systems
1_GA_G3_29	Oral administration: time course for systemic appearance, factors eg pKa, lipid solubility, active transport
1_GA_G3_30	Bioavailability of drugs given orally and its measurement
1_GA_G3_31	Drug elimination from plasma. Mechanisms: distribution, metabolism, excretion, exhalation, renal, biliary, sweat, breast milk
1_GA_G3_32	Factors affecting drug elimination eg pathological state, renal and hepatic failure, age, gender, drug interactions
1_GA_G3_33	Active and inactive metabolites, pro-drugs. Enzyme induction and inhibition
1_GA_G3_34	Non-enzymatic drug elimination. Hofmann degradation
1_GA_G3_35	Pharmacokinetic modelling: types of models available, one, two and three compartment models, non-compartmental, physiological

1_GA_G3_36	Pharmacokinetic parameters: volume of distribution, half-life and time constant, clearance
1_GA_G3_37	Context sensitive half-time: comparison of drugs eg propofol, fentanyl and remifentanil. Target controlled infusions (TCI)
1_GA_G3_38	TCI in practice: accuracy, applicability, cost. Variations due to patient differences – predictable and unpredictable
1_GA_G3_39	Pharmacogenetics: pharmacokinetic variation eg pseudocholinesterase, acetylation, CYP450 variants

1_GA_G3_40	Differences in patient response to therapy: gender, pathology, polypharmacy, changes occurring with increasing age
1_GA_G3_41	Poor and fast metabolisers, racial and geographic distribution of common abnormal genes
1_GA_G3_42	Volatile and gaseous anaesthetic agents: structure of available agents, MAC, clinical effects on CNS, CVS, RS, pharmacokinetics including metabolism
1_GA_G3_43	Mechanisms of general anaesthetic action
1_GA_G3_44	Factors that affect the onset and offset time. Oil/gas partition coefficient. Intravenous anaesthetic agents: chemical classes, properties of an ideal induction agent, adverse effects on CNS, CVS, RS, pharmacokinetics including metabolism
1_GA_G3_45	Benzodiazepines: classification of action, clinical actions, synergism with anaesthetic agents, antidote in overdose
1_GA_G3_46	Local anaesthetic agents. Additional effects including anti-arrhythmic effects. Mechanism of action. Clinical factors influencing choice: operative site, patient, available agents. Toxicity syndrome: safe clinical and maximum clinical doses, treatment of overdose
1_GA_G3_47	Analgesics. Simple analgesics, NSAIDs and opioids. Available routes of administration, perioperative prescribing, chronic compared with acute pain prescribing
1_GA_G3_48	Aspirin and paracetamol. Comparison of structures, indications and contraindications, mechanism of action, bioavailability, metabolism, toxicity
1_GA_G3_49	Non steroidal anti inflammatory analgesics: classification, mechanism of action, clinical effects and uses, unwanted effects, contraindications
1_GA_G3_50	Opioid analgesics: receptor classification, mechanism of action, inhibitory effects, sites of action on pain pathways, unwanted effects, full and partial agonists, routes of administration. Opioid dependence and tolerance

1_GA_G3_51	Muscle relaxants: Classification. Sites of action. Properties of an ideal muscle relaxant. Dantrolene and management of MH Depolarizing muscle relaxants: Structure, mechanism of action. Organophosphate poisoning Adverse effects and contraindications
1_GA_G3_52	Non-deploarising muscle relaxants: structural classification, sub-classification according to onset time and duration of action. Comparison of aminosteroids and benzylisoquinoliniums. Comparison of individual agents: metabolism and active metabolites. Unwanted effects
1_GA_G3_53	Reversal of neuromuscular blockade: indications for use, mechanism of action, clinically unwanted effects of reversal of neuromuscular blockade
1_GA_G3_54	Drugs and the autonomic nervous system: anatomy, myelinated and unmyelinated nerves, ganglia and rami communicantes
1_GA_G3_55	Neurotransmitters: sites at which drugs act to interfere with autonomic transmission

1_GA_G3_56	Drugs and the sympathetic nervous system: adrenergic receptors and molecular mechanisms of action, indications for pharmacological use of naturally occurring and synthetic analogues. Other classes of drugs active in the sympathetic system eg MAOIs
1_GA_G3_57	Drugs and the parasympathetic nervous system: nicotinic and muscarinic receptors with subgroups, mechanism of action agonists and antagonists, comparison of available drugs
1_GA_G3_58	Cardiovascular system: drug effects on the heart and on the circulation, arterial and venous effects, systemic and pulmonary effects
1_GA_G3_59	Inotropes and pressors: classification, site of action, synthetic inotropes compared with adrenaline
1_GA_G3_60	Drugs used in ischaemic heart disease: classification of drugs uses, mechanism of drug action, use in unstable angina
1_GA_G3_61	Antiarrhythmic drugs: classification, indications for use including in resuscitation
1_GA_G3_62	Hypotensive agents: classes of drugs to produce acute hypotension in theatre. Therapeutic antihypertensive agents: classification according to mechanism of action. Adverse effects of drugs in each class
1_GA_G3_63	Anticoagulants: oral and parenteral. Sites of action, indications for use, monitoring effect. Comparison of heparins: unfractionated and fractionated. Newer anticoagulants. Antiplatelet agents. Perioperative management of antiplatelet and anticoagulant medication

1_GA_G3_64	Pro-coagulants: drugs, individual factor concentrates, multifactor preparations including FFP, vitamin K
1_GA_G3_65	Colloids including blood and blood products: composition of preparations, safe use and avoidance of errors
1_GA_G3_66	Crystalloid fluids: composition, suitable fluids for maintenance and replacement of losses. Comparison with colloids, unwanted effects
1_GA_G3_67	Electrolyte solutions including conversion between units eg molar, mg/ml, %
1_GA_G3_68	Respiratory system: classes of drug acting on the respiratory tract including bronchodilators, oxygen, surfactant, mucolytics, pulmonary vasodilators. Methods of administration, indications for use, mechanism of action, adverse effects
1_GA_G3_69	Respiratory system: drugs used in acute severe asthma and chronic asthma, volatile agents, mechanisms of action
1_GA_G3_70	Gastrointestinal system: antisialogogues, drugs reducing gastric acidity, drug effects on the GI tract including gastric and bowel motility
1_GA_G3_71	Applied pharmacology of pro-kinetic and antacids including simple alkalis, H_2 receptor antagonists and proton pump inhibitors
1_GA_G3_72	Antiemetics including anatomical sites for antiemetic action, central and peripheral inputs to the vomiting centre, use of dexamethasone
1_GA_G3_73	Renal system: diuretics, classification of diuretics, unwanted effects, indications for use
1_GA_G3_74	CNS: antiepileptic agents, mechanism of action and unwanted effects
1_GA_G3_75	CNS: antidepressants, classes of drug, anaesthetic relevance, toxicity in overdose
1_GA_G3_76	Diabetes mellitus: drugs used in type 1 and type 2 diabetes, insulins: classification, routes of administration. Perioperative management of diabetic therapy. Unwanted effects and risks of hyper/hypo glycaemia and its therapeutic management
1_GA_G3_77	Hormones – corticosteroids: indications for use, clinical effects, long term complications of glucocorticoid use
1_GA_G3_78	Hormones – treatment of thyroid disorders: synthesis and release of thyroid hormones, preparations used in hyper and hypothyroidism
1_GA_G3_79	CNS stimulants: classes, mechanisms of action, uses in anaesthesia
1_GA_G3_80	RS stimulants including theophyllines and doxapram

1_GA_G3_81	Antimicrobial agents: general classification, types of antimicrobial agent, antiviral, antibacterial, antifungal, bacteriostatic and bacteriocidal, mechanisms of action, indications for use of different classes of antibiotics, bacterial resistance
1_GA_G3_82	Effects of drugs on the eye and vision including effect on intra-ocular pressure
1_GA_G3_83	Social and recreational drugs including tobacco, alcohol and non-legal drugs and their anaesthetic relevance

1_GA_H: Provides safe general anaesthesia with distant supervision for ASA 1-3 adults undergoing non-complex elective and emergency surgery within the general theatre setting

1_GA_H_1	Universal precautions and good working practices for the control of infection including: a. Decontaminate hands before treating patient b. The use of gloves c. The use of sterilised equipment d. The disposal of used clinical consumables (single use and reusable)
1_GA_H_2	Pharmacology and pharmacokinetics, including doses, interactions and significant side effects of drugs used during induction of anaesthesia
1_GA_H_3	Management of common problems encountered in patients requiring emergency surgery
1_GA_H_4	Discusses how patients may be inadequately fasted and how this problem is managed
1_GA_H_5	Describes the NCEPOD classifications and explains the importance of these in delivering surgical care to patients

1_GA_I: Describes the specific needs of the obese, frail and elderly patients undergoing general anaesthesia

1_GA_I_1	Anaesthetic management of obese, frail and elderly patients

1_GA_J: Manages intra-operative fluid balance appropriately

1_GA_J_1	Principles of postoperative fluid regimes including volumes, types of fluids and monitoring of fluid balance
1_GA_J_2	Perioperative fluid and feeding

1_GA_K: Can identify patients with difficult airways. Demonstrates management of the 'cannot intubate cannot oxygenate' scenario in simulation, and describes difficult airway guidelines

1_GA_K_1	Methods commonly used for assessing the airway to predict difficulty with tracheal intubation, including radiology and its interpretation
1_GA_K_2	Difficult/failed mask ventilation
1_GA_K_3	Failed intubation
1_GA_K_4	Management of the 'can't intubate, can't oxygenate' scenario

1_GA_K_5	Indications for emergency front of neck access
1_GA_K_6	Conditions that may complicate airway management eg anatomical variation, tumour, bleeding

1_GA_L: Recognises the challenges associated with shared airway surgery

1_GA_L_1	Anaesthetic issues of the shared airway
1_GA_L_2	Specialised devices used to maintain the airway during head and neck surgery
1_GA_L_3	Anaesthetic implications of special surgical devices used during head and neck surgery
1_GA_L_4	Anaesthetic techniques for common ENT and dental procedures; specific anaesthetic issues of ENT and maxilla-facial procedures
1_GA_L_5	Principles of management of bleeding tonsils
1_GA_L_6	Principles of the emergency management of the obstructed airway including tracheostomy
1_GA_L_7	Equipment and safety features associated with the use of LASER

1_GA_M: Provides safe anaesthesia for diagnostic or therapeutic procedures in the non-theatre environment for ASA 1-2 adults with local supervision

1_GA_M_1	Risks and benefits to patients, and risks to staff from common radiological investigations and procedures including the use of contrast media
1_GA_M_2	Awareness of statutory radiological regulations as applied to the referrer, practitioner or operator of diagnostic services
1_GA_M_3	Safe precautions and equipment requirements in specific environments eg MRI suites
1_GA_M_4	Specific anaesthetic implications of imaging techniques including but not limited to MRI and CT scanning, angiography
1_GA_M_5	Hazards associated with induction of anaesthesia in unusual/remote places eg emergency room and in special circumstances including, but not exclusively, brain injury, full stomach, sepsis, upper airway obstruction

1_GA_N: Explains the principles of anaesthetic care for patients presenting with major trauma

1_GA_N_1	Principles of the perioperative management of the trauma patient
1_GA_N_2	Vascular access in trauma patients including the intraosseous route
1_GA_N_3	Investigations and imaging in trauma
1_GA_N_4	Management of patients with brain injury, including the use of the Glasgow coma scale; mechanisms for the prevention of secondary brain injury
1_GA_N_5	Management of patients with potential cervical spine trauma
1_GA_N_6	Principles of the primary and secondary survey in trauma patients
1_GA_N_7	Pathophysiology associated with trauma
1_GA_N_8	Airway management in the trauma patient including recognition of the compromised airway

1_GA_N_9	Effects of hypothermia in trauma and its prevention

1_GA_O: Explains the principles of paediatric anaesthesia taking into account the anatomical, physiological, psychological and pharmacological differences from adults and their implications for safe practice

1_GA_O_1	Basic sciences specific to children aged one year and above
1_GA_O_2	Preoperative assessment and psychological preparation of children aged five years and above (and their parents) for surgery
1_GA_O_3	Pre-operative fasting in children
1_GA_O_4	Premedication including topical anaesthesia for venepuncture in children
1_GA_O_5	Significance of upper respiratory tract infections and, as a result, when to cancel operations
1_GA_O_6	Obtaining consent for anaesthesia in children

1_GA_P: Provides safe general anaesthesia for ASA 1-2 children 5 years and over with local supervision and 10 years with distant supervision undergoing non-complex elective and emergency surgery

1_GA_P_1	Induction of anaesthesia for children aged 5 years and above
1_GA_P_2	Maintenance of anaesthesia for children aged 5 years and above
1_GA_P_3	Recovery from anaesthesia for children aged 5 years and above
1_GA_P_4	Management of perioperative pain, nausea and vomiting in children including common regional techniques eg caudal
1_GA_P_5	Fluid and electrolyte management in children
1_GA_P_6	Drug dosing in children
1_GA_P_7	Paediatric anaesthetic equipment and the differences from adult practice
1_GA_P_8	Sizing tracheal tubes, supraglottic devices and other airway adjuncts
1_GA_P_9	Breathing systems and the appropriate fresh gas flow rates

1_GA_Q: Explains the anaesthetic implications of pregnancy and undertakes safe general anaesthesia for ASA 1-3 obstetric patients

1_GA_Q_1	The anatomy, physiology and pharmacology related to pregnancy and labour
1_GA_Q_2	Common obstetric indications for anaesthetic intervention of the delivery suite
1_GA_Q_3	The effects of aortocaval compression and how to avoid it
1_GA_Q_4	How to assess fetal well-being in utero
1_GA_Q_5	Local feeding/starvation policies and the reasons behind them
1_GA_Q_6	Thromboprophylaxis requirements in pregnancy
1_GA_Q_7	The grading of urgency of Caesarean section
1_GA_Q_8	Why anaesthetic techniques must be modified in the pregnant patient
1_GA_Q_9	How to access local maternity guidelines and the value of having these guidelines

1_GA_Q_10	Explains the implications of exposing the pregnant or potentially pregnant patient to ionising radiation

1_GA_R: Performs immediate resuscitation and care for patients with acute obstetric emergencies under distant supervision, recognising when additional help is required

1_GA_R_1	The management of pre-eclampsia and eclampsia
1_GA_R_2	Risk factors and management of major obstetric haemorrhage
1_GA_R_3	Modification of ALS guidelines in the pregnant patient

1_GA_S: Describes the principles of total intravenous anaesthesia and uses it safely in clinical practice for non-complex cases

1_GA_S_1	Principles of use of total intravenous anaesthesia

Regional Anaesthesia (RA)

1_RA_A: Explains clearly to patients the risks and benefits of regional anaesthesia

1_RA_A_1	Obtaining consent form patients undergoing regional blockade

1_RA_B: Describes the indications and contraindications to regional anaesthesia techniques

1_RA_B_1	Advantages/disadvantages, risks/benefits and indications/contraindications of regional blockade

1_RA_C: Practices measures to avoid wrong-site blocks

1_RA_C_1	Safety measures to prevent wrong site blocks such as Stop Before You Block

1_RA_D: Performs spinal anaesthesia for ASA 1-3 surgical patients independently

1_RA_D_1	Principles of performing, and potential complications of, subarachnoid and lumbar/caudal epidural anaesthesia procedures

1_RA_E: Performs simple peripheral nerve blocks with ultrasound

1_RA_E_1	Describes clinical features and potential complications of common simple nerve blocks, including principles of performing: Interscalene and Axillary brachial plexus blocks, distal upper limb nerve blocks (elbow and wrist)

1_RA_F: Performs ultrasound-guided femoral or fascia iliaca blocks independently

1_RA_F_1	Describes clinical features and potential complications of common plane and Lower Limb blocks, including principles of performing: Femoral nerve blocks, fascia iliaca blocks

1_RA_G: Identifies and initiates initial management of complications of regional anaesthesia including systemic local anaesthetic toxicity, high spinal and dural puncture headache

1_RA_G_1	The immediate management of accidental dural puncture and treatment of post-dural puncture headache

1_RA_G_2	Accidental intravenous administration of local anaesthetic drugs, signs, symptom and management including the role of lipid emulsion
1_RA_G_3	Management of incomplete or failed regional blockade including, where appropriate, the use of rescue blocks
1_RA_G_4	Post-operative analgesia following regional anaesthesia
1_RA_G_5	Review of regional anaesthesia post-operatively including instructions for the patient

1_RA_H: Provides epidural or combined spinal-epidural analgesia for labour in the ASA 1-3 obstetric patient, and offers other forms of pain relief when neuraxial analgesia is contraindicated

1_RA_H_1	Methods of analgesia during labour and discusses their indications and contraindications
1_RA_H_2	Epidural of CSE analgesia in labour; indications, contraindications and complications

1_RA_I: Provides neuraxial anaesthesia for operative delivery and other obstetric procedures in ASA 1-3 patients and manages the inadequate neuraxial block

1_RA_I_1	Provision of regional anaesthesia for operative delivery
1_RA_I_2	Understands the need and when to call for assistance with regional block for obstetric anaesthesia

1_RA_J: Discusses the scientific basis of ultrasound and the generation of ultrasound images

1_RA_J_1	Physical principles of generation of ultrasound images
1_RA_J_2	Demonstrates use of ultrasound for nerve identification

1_RA_K: Discusses drugs and equipment used in regional anaesthesia

1_RA_K_1	Knowledge of drugs used for regional anaesthesia including doses and toxicity
1_RA_K_2	Safe use of equipment for provision of regional anaesthesia

Resuscitation and Transfer (RT)

1_RT_A: Explains the pathophysiology of respiratory and cardiac arrest

1_RT_A_1	Explains the physiology underpinning cardiopulmonary resuscitation
1_RT_A_2	Causes of respiratory arrest including but not limited to: drugs, toxins, trauma, infection, neurological disorders, muscular disorders
1_RT_A_3	Causes of cardiac arrest including but not limited to: ischaemic heart disease, valvular heart disease, drugs, hereditary heart disease, cardiac conduction abnormalities, electrolyte abnormalities, electrocution, trauma, thromboembolism

1_RT_B: Initiates resuscitation appropriately in all patient groups in accordance with the latest guidance

1_RT_B_1	Describes the basic principles of the ECG and recognises arrhythmias including ventricular fibrillation, ventricular tachycardia, asystole, rhythms associated with pulseless electrical activity
1_RT_B_2	Mode of action of drugs used in the management of respiratory and cardiac arrest in adults and children including: adrenaline, atropine, amiodarone, magnesium, naloxone, intralipid
1_RT_B_3	Doses of drugs, routes given (including indications for intraosseous access and sites that can be used) and frequency during resuscitation from a respiratory or cardiac arrest
1_RT_B_4	Explains the need for supplementary oxygen during resuscitation from a respiratory or cardiac arrest in adults and children
1_RT_B_5	Advantages and disadvantages of different techniques for airway management during the resuscitation including: oro and nasopharyngeal airways, supraglottic airways, tracheal intubation
1_RT_B_6	Explains the reasons for avoiding hyperventilation during resuscitation
1_RT_B_7	Compares the methods by which ventilation can be maintained in a patient suffering a respiratory or cardiac arrest using mouth to mask, self inflating bag, anaesthetic circuit and mechanical ventilator
1_RT_B_8	Mechanisms of defibrillation and the factors influencing the success of defibrillation
1_RT_B_9	Monophasic and biphasic defibrillators
1_RT_B_10	Principles of safely and effectively delivering a shock using both manual and automated defibrillators
1_RT_B_11	Explains the need for continuous chest compressions during resuscitation from cardiac arrest once the trachea is intubated
1_RT_B_12	Explains the need for minimising interruptions to chest compressions
1_RT_B_13	Reversible causes of cardiac arrest ant their treatment including hypoxia, hypovolaemia, hyper/hypokalaemia, hypothermia, tension pneumothorax, tamponade, toxins, thromboembolism
1_RT_B_14	Describes the current adult and paediatric advanced life support algorithms
1_RT_B_15	Discusses the specific actions required when managing a cardiac arrest due to: poisoning, electrolyte disturbance, hypo/hyperthermia, drowning, anaphylaxis, asthma, trauma, pregnancy (including peri-mortem Caesarean section) and electrocution
1_RT_B_16	Signs of the return of a spontaneous circulation
1_RT_B_17	The importance of capnography in resuscitation
1_RT_B_18	Investigations needed after recovery from a respiratory or cardiac arrest
1_RT_B_19	Principles of care after successful resuscitation from a respiratory or cardiac arrest

1_RT_C: Describes ethical and legal issues associated with resuscitation including advance directives

1_RT_C_1	Discusses the importance of respecting the wishes of relatives to be present during a resuscitation attempt

1_RT_C_2	Treatment escalation plans, DNAR and stopping resuscitation
1_RT_C_3	Importance of respecting the wishes of patients regarding end of life decisions

1_RT_D: Participates in debrief sessions for staff and relatives in a sensitive, compassionate and constructive manner

1_RT_D_1	Appropriate communication skills for debrief sessions following resuscitation episodes

1_RT_E: Demonstrates the safe management of the inter-hospital transfer of the critically ill but stable patient by road

1_RT_E_1	Clinical requirements for safe transfer
1_RT_E_2	Minimal monitoring requirements for transfer
1_RT_E_3	Principles of transfer ventilators
1_RT_E_4	Consent for transfer
1_RT_E_5	Use of controlled drugs during transfer including records
1_RT_E_6	Documentation during transfer
1_RT_E_7	Protocols governing transfer of patients between departments
1_RT_E_8	Communication with the patient and members of the transfer team

1_RT_F: Assesses the clinical risks associated with transfer for individual patients

1_RT_F_1	Risks/benefits of intra-hospital transfer
1_RT_F_2	Physical hazards associated with intra-hospital transfer
1_RT_F_3	Potential complications arising during transfer and preventative measures
1_RT_F_4	Explains how to assess and manage an uncooperative and aggressive patient during transfer

1_RT_G: Safely performs intra-hospital transfer of patients including retrieval of patients newly referred to critical care

1_RT_G_1	Equipment (including back-up equipment) and personnel required for intrahospital transfer
1_RT_G_2	Intra-hospital transfer of trauma patients

1_RT_H: Explains scoring systems in the management of deteriorating patients and responds appropriately

1_RT_H_1	Relevance of changing parameters in early warning scoring systems eg NEWS
1_RT_H_2	Knowledge of critical illness scoring systems such as SOFA, APACHE

Procedural sedation (PS)

1_PS_A: Conducts appropriate pre-assessment of patients with respect to sedation; understands patient related risk factors and plans accordingly

1_PS_A_1	Use of explanations and reassurance in alleviating the patient's anxiety

1_PS_A_2	Patient factors that may affect provision of safe procedural sedation

1_PS_B: Chooses safe, appropriate sedative drugs to deliver conscious sedation

1_PS_B_1	Rationale for the use of different anxiolytic and sedative drugs

1_PS_C: Describes the particular dangers associated with the use of single or combinations of sedative drugs particularly in the frail, elderly or critically ill patient and those requiring transfer

1_PS_C_1	Applied pharmacology of sedative and anxiolytic drugs

1_PS_D: Monitors a sedated patient's physiology appropriately

1_PS_D_1	Demonstrates use of monitoring for a sedated patient

1_PS_E: Ensures the provision of safe post-procedural care

1_PS_E_1	Appropriate care and monitoring of patients following a procedure under sedation

1_PS_F: Explains the different levels of sedation and appreciates the risks associated with these

1_PS_F_1	Knowledge of sedation assessment methods such as RASS

1_PS_G: Recognises and manages the complications of sedation

1_PS_G_1	Demonstrates assessment and management of complications of sedation

Pain (PA)

1_PA_A: Can recognise, examine, assess and manage acute pain in the surgical and non-surgical patient

1_PA_A_1	Anatomy and physiology of pain medicine to include nociceptive, visceral and neuropathic pain
1_PA_A_2	Assessment of the severity of acute pain
1_PA_A_3	Principles of neural blockade for acute pain management

1_PA_B: Is able to safely and appropriately prescribe medication for pain management

1_PA_B_1	Postoperative analgesic regimes including types of drugs and doses
1_PA_B_2	Management of 'rescue analgesia' for the patient with severe pain
1_PA_B_3	Complications of analgesic drugs

1_PA_C: Demonstrates effective communication skills regarding pain management with patients, relatives and carers

1_PA_C_1	Effective communication skills in relation to pain management

1_PA_D: Demonstrates the basic assessment and management of acute on chronic pain in adults

1_PA_D_1	Describes a basic understanding of chronic pain in adults
1_PA_D_2	Relationship between acute and chronic pain

1_PA_E: Describes the concept of biopsychosocial multi-disciplinary pain management

1_PA_E_1	Contributory factors involved in severity and perception of pain
1_PA_E_2	Describes the organisation and objectives of an acute pain service
1_PA_E_3	Explains the limitations of pain medicine

1_PA_F: Describes the special circumstances in assessing and managing perioperative pain in specific patient groups including children, pregnancy and breast feeding, the elderly and frail, those with learning and communication difficulties, autism, dementia, renal and hepatic impairment and substance abuse

1_PA_F_1	Discusses the management of acute preoperative pain
1_PA_F_2	Principles of pain relief in the trauma patient and methods used (from emergency room to postoperatively)
1_PA_F_3	Assessments of pain in all patient groups
1_PA_F_4	Methods of analgesia during labour and discusses their indications and contraindications

1_PA_G: Demonstrates the safe use of equipment used in pain management

1_PA_G_1	Knowledge and understanding of PCA and PCEA infusion devices

Intensive Care Medicine (ICM)

1_ICM_A: Recognises the limitations of intensive care; employs appropriate admission criteria

1_ICM_A_1	Triages and prioritises patients appropriately including timely admission to ICU

1_ICM_B: Performs safely and effectively the clinical invasive procedures required to maintain respiratory, cardiovascular and renal support

1_ICM_B_1	Landmarks for the insertion of intercostal drainage catheters
1_ICM_B_2	CVP line insertion, femoral line insertion
1_ICM_B_3	Practice and principles of direct arterial BP monitoring

1_ICM_C: Recognises, assesses and initiates management for acutely ill adults cross the spectrum of single or multiple organ failure

1_ICM_C_1	Recognition, assessment and stabilisation of the acutely ill patient with disordered physiology
1_ICM_C_2	Describes the resuscitation of patients with hypovolaemia and electrolyte abnormalities

1_ICM_D: Recognises the acutely ill child and initiates management of paediatric emergencies

1_ICM_D_1	Recognition, assessment and stabilisation of the critically ill child
1_ICM_D_2	Management of acute airway obstruction including croup, epiglottitis and inhaled foreign body

1_ICM_E: Recognises and manages the patient with sepsis and employs local infection control policies

1_ICM_E_1	Knowledge and understanding of management of patients with sepsis including appropriate antibiotic therapy

1_ICM_F: Undertakes and evaluates laboratory and clinical imaging investigations to manage patients while critically ill during their intensive care stay

1_ICM_F_1	Interpretation of investigations such as haematology and biochemistry blood results (including arterial blood gases) and radiological tests

1_ICM_G: Manages the medical/surgical needs and organ support of patients during their critical illness including the holistic care of patients and relatives

1_ICM_G_1	Manages the care of critically ill patients with specific medical conditions

1_ICM_H: Plans and communicates the appropriate discharge of patients from intensive care to health care professionals, patients and relatives

1_ICM_H_1	Demonstrates appropriate communications skills in a critical care setting

1_ICM_I: Manages end of life care within the intensive care environment with patients, relatives and the multi-professional team

1_ICM_I_1	Demonstrates management of end of life care incorporating an holistic approach

1_ICM_J: Liaises with transplant services when appropriate, can perform brain stem death testing and provides the physiological support of the donor

1_ICM_J_1	Describes brain stem death testing

1_ICM_K: Supports clinical staff outside the ICU to enable the early detection of the deteriorating patient

1_ICM_K_1	Responds appropriately to changes in early warning scores for patients outside of ICU

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