Practice Single Best Answer Questions for the Final FRCA

A Revision Guide

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Edited by

Hozefa Ebrahim
Specialist Registrar, Queen Elizabeth Hospital, Birmingham,
Associate Clinical Teaching Fellow,
University Hospitals Birmingham, UK

Khalid Hasan
Consultant and College Tutor,
Queen Elizabeth Hospital, Birmingham, UK

Mark Tindall
Consultant and College Tutor,
Russells Hall Hospital, Birmingham, UK

Michael Clarke
Specialist Registrar, Queen Elizabeth Hospital, Birmingham,
and Advanced Pain Fellow, University of Birmingham, UK

Natish Bindal
Consultant in the Department of Anaesthesia,
and Consultant, Queen Elizabeth Hospital, Birmingham, UK

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Contents

Principal contributors

Edward Copley
Specialist Registrar in Anaesthesia
West Midlands Deanery, Birmingham, UK

Anna Pierson
Specialist Registrar in Anaesthesia
West Midlands Deanery, Birmingham, UK

Richard Pierson
Specialist Registrar in Anaesthesia
West Midlands Deanery, Birmingham, UK

Contributors

Michael Allan
Specialist Registrar in Anaesthesia
West Midlands Deanery, Birmingham, UK

Natish Bindal
Consultant Anaesthetist
Queen Elizabeth Hospital, Birmingham, UK

Catriona Bentley
Specialist Registrar in Anaesthesia
West Midlands Deanery, Birmingham, UK

Hannah Church
Consultant Anaesthetist
Queen Elizabeth Hospital,
Birmingham, UK

Michael B Clarke
Advanced Pain Trainee
Specialist Registrar in Anaesthesia
West Midlands Deanery,
Birmingham, UK

Lloyd Craker
Consultant Anaesthetist
North Staffordshire Hospital, UK

Nicholas Crombie
Consultant Anaesthetist
Queen Elizabeth Hospital,
Birmingham, UK

Neil H Crooks
Specialist Registrar in Anaesthesia and
Intensive Care Medicine
West Midlands Deanery,
Birmingham, UK

Hozefa Ebrahim
Specialist Registrar in Anaesthesia and
Intensive Care Medicine
West Midlands Deanery,
Birmingham, UK

Ian Ewington
Specialist Registrar in Anaesthesia
and Intensive Care Medicine
West Midlands Deanery,
Birmingham, UK

James Geoghegan
Consultant Anaesthetist
Queen Elizabeth Hospital,
Birmingham, UK

Au-Chyun Nicole Goh
Clinical Fellow in Paediatric Intensive
Care Medicine
Birmingham Children's Hospital, UK

Andrew G Haldane
Specialist Registrar in Anaesthesia
West Midlands Deanery, Birmingham, UK

Khalid Hasan
Consultant Anaesthetist and College Tutor
Queen Elizabeth Hospital, Birmingham, UK

Max Simon Hodges
Specialist Registrar in Anaesthesia
West Midlands Deanery, Birmingham, UK

Principal contributors

Eric Hodgson
Chief Specialist Anaesthesiologist,
Inkosi Albert Luthui Central Hospital
Honorary Senior Lecturer,
Nelson R Mandela School of Medicine,
Durban, South Africa

Asim Iqbal
Clinical Fellow in Hepatobiliary Anaesthesia
Specialist Registrar in Anaesthesia
West Midlands Deanery, Birmingham, UK

Paul Jeanrenaud
Consultant in Intensive Care Medicine and Anaesthesia
Whiston Hospital, Merseyside, UK

Emily Johnson
Specialist Registrar in Anaesthesia
West Midlands Deanery,
Birmingham, UK

Deepak Joseph
Specialist Registrar in Anaesthesia
West Midlands Deanery,
Birmingham, UK

Michael McAlindon
Specialist Registrar in Anaesthesia and Intensive Care Medicine
West Midlands Deanery,
Birmingham, UK

Craig McGrath
Consultant Anaesthetist
Queen Elizabeth Hospital, Birmingham, UK

Randeep Mullhi
Specialist Registrar in Anaesthesia and Intensive Care Medicine
West Midlands Deanery, Birmingham, UK

Rebecca Paris
Specialist Registrar in Anaesthesia
West Midlands Deanery, Birmingham, UK

Sachin Rastogi
Pain Fellow
The Hospital for Sick Children,
Toronto, Canada

Simon Smart
Consultant Anaesthetist
Queen Elizabeth Hospital,
Birmingham, UK

Insiya Susnerwalla
Specialty Trainee in Anaesthesia
North Western Deanery, Manchester, UK

Alifia Tameem
Specialist Registrar in Anaesthesia
West Midlands Deanery, Birmingham, UK

Mark Tindall
Consultant Anaesthetist
Russells Hall Hospital, Dudley, UK

Laura Tulloch
Specialist Registrar in Anaesthesia and Intensive Care Medicine
West Midlands Deanery,
Birmingham, UK

Abbreviations

AAA	abdominal aortic aneurysm
AChR	acetylcholine receptor
ACT	activated clotting time
ACTH	adrenocorticotrophic hormone
ADH	antidiuretic hormone
AIR	anaesthesia-related rhabdomyolysis
AKI	acute kidney injury
ALSG	advanced life support group
ALI	acute lung injury
APTT	activated partial thromboplastin time
ARDS	acute respiratory distress syndrome
ARF	acute renal failure
BMI	body mass index
BMS	bare metal stent
BP	blood pressure
CABG	coronary artery bypass graft
CAS	central anticholinergic syndrome
CDH	congenital diaphragmatic hernia
CDI	*Clostridium difficile* infection
CK	creatine kinase
$CMRO_2$	cerebral metabolic oxygen replacement
CNB	central neuraxial block
CNS	central nervous system
CO	cardiac output
COHb	carboxyhaemoglobin
CPB	cardiopulmonary bypass
CPP	chronic pelvic pain
CPSP	chronic postsurgical pain
CRF	chronic renal failure
CRPS	complex regional pain syndrome
CSE	combined spinal–epidural
CSF	cerebrospinal fluid
CT	computerized tomography
CTPA	computerized tomography pulmonary angiogram
CRT	cardiac resynchronization therapy
CSWS	cerebral salt-wasting syndrome
CXR	chest X-ray
DAPT	dual antiplatelet therapy
DES	drug-eluting stent
DI	diabetes insipidus
DLT	double lumen tube
DKA	diabetic ketoacidosis

DMD	Duchenne's muscular dystrophy
DMSO	dimethyl sulphoxide
DVT	deep vein thrombosis
ECMO	extracorporeal membrane oxygenation
ECT	electroconvulsive therapy
EPO	erythropoietin
ERCP	endoscopic retrograde cholangiopancreatography
ETT	endotracheal tube
EVAR	endovascular aortic aneurysm repair
EVLWI	extravascular lung water index
FEV_1	forced expiratory volume in 1 second
FES	fat embolism syndrome
FFP	fresh frozen plasma
GA	general anaesthetic
GABA	gamma amino-butyric acid
GBS	Guillain–Barré syndrome
GCS	Glasgow coma score
GFR	glomerular filtration rate
GI	gastrointestinal
HCAI	healthcare-associated infection
HDU	high-dependency unit
HFOV	high-frequency oscillatory ventilation
HITT	heparin-induced thrombotic thrombocytopenia
HLHS	hypoplastic left heart syndrome
HR	heart rate
IABP	intra-aortic balloon pump
IBW	ideal body weight
ICDSC	intensive care delirium screening checklist
ICP	intracranial pressure
ICS	intraoperative cell salvage
ICU	intensive care unit
ID	internal diameter
INR	international normalized ratio
LBBB	left bundle branch block
LBW	lean body weight
LMA	laryngeal mask airway
LMWH	low molecular weight heparin
LRTI	lower respiratory tract infection
LV	left ventricle
MAC	minimum alveolar concentration
MAOI	monoamine oxidase inhibitor
MELD	model for end-stage liver disease
MEN	multiple endocrine neoplasia
MG	myasthenia gravis
MPM	mortality prediction model
MR	magnetic resonance

List of abbreviations

MRI	magnetic resonance imaging
MVR	mitral valve replacement
NCA	nurse-controlled analgesia
NIBP	non-invasive blood pressure
NPV	negative predictive value
NSAID	non-steroidal anti-inflammatory drug
OLV	one-lung ventilation
OSA	obstructive sleep apnoea
PA	pulmonary artery
PAC	pulmonary artery catheter
PAFC	pulmonary artery flotation catheter
PCA	patient-controlled analgesia
PCI	percutaneous coronary intervention
PD	Parkinson's disease
PDPH	postdural puncture headache
PEEP	positive end-expiratory pressure
PICU	paediatric intensive care unit
POCD	postoperative cognitive dysfunction
PONV	postoperative nausea and vomiting
PPH	postpartum haemorrhage
PPV	positive predictive value
PRIS	propofol-related infusion syndrome
PT	prothrombin time
PTC	post-tetanic count
PTE	pulmonary thromboembolism
PVL-SA	Panton–Valentine leukocidin-producing *Staphylococcus aureus*
RA	right atrium
RASS	Richmond Agitation Sedation Score
RSI	rapid sequence induction
RV	right ventricle
SAH	subarachnoid haemorrhage
SAPS	simplified acute physiology score
SBE	subacute bacterial endocarditis
SIADH	syndrome of inappropriate antidiuretic hormone
SJW	St John's wort
SNRI	serotonin and noradrenaline reuptake inhibitor
SSRI	selective serotonin reuptake inhibitor
SUNCT	short-lasting, unilateral neuralgiform headache
TACO	transfusion-associated circulatory overload
TAP	transversus abdominis plane
TBI	traumatic brain injury
TBSA	total body surface area
TBW	total body weight
TCA	tricyclic antidepressant
TCI	target-controlled infusion
TEG	thrombo-elastograph

TENS	transcutaneous electrical nerve stimulation
TIVA	total intravenous anaesthesia
TLS	tumour lysis syndrome
TMJ	temporomandibular joint
TOE	transoesophageal echocardiogram
TOF	train of four
TRALI	transfusion-related acute lung injury
TSH	thyroid stimulating hormone
TTE	transthoracic echocardiogram
UFH	unfractionated heparin
URTI	upper respiratory tract infection
vCJD	variant Creutzfeldt–Jakob disease
VAE	venous air embolism
VC	vital capacity
VF	ventricular fibrillation
VT	ventricular tachycardia
VTE	venous thromboembolism
vWF	von Willebrand's factor
WP	widespread pain index

Classification of questions by topic

Category					
Basic sciences	A23, B9	D2, D22	F16 K15		H22
Cardiac and thoracic anaesthesia and intensive care medicine	D25 B3, B4, B13, B20	E2, E8, E9, E10, E13	F7, F21 A28, C24	G28	H5, H7, H9 J25, J28
Burns and trauma	A12, B25	K3, K11			
Equipment and clinical measurement	D1, D5			G30	
General anaesthetic practice	A2, A3, A4, A5, A6, A25, A26, A27, A30	C2, C3, C4, C21, C26, C28, C29, C30, C1	F12, F18, F20, F22, F23, F25, F26, F28, F29, F30	G2, G3, G4, G17, G21, G23, G26, G27, G29	H4, H8, H11, H16, H26
	B11, B12, B14, B15, B18	E1, E3, E4, E6, E7, E11, E30	J2, J12, J13, J16, J17, J18, J22, J29, J30		K1, K16, K 21, K 24, K 25, K 27, K 29, K 30
	D3, D4, D25, D27, D28, D30				
Intensive care medicine	C5, C9, C13, C17, C7, C12, C15, C27, E24	D6, D14, D15, A1, A7, A9, A10, A11, A17, A19, A29, B1, B2, B5, B6, B7, B22, B26, B28, B30	F1, F4, F9	G5, G8, G11, G12, G13, G25	H1, H12, H17, H30
			J3, J7, J11, J23, J26		K2, K6, K9, K10, K14, K17, K24, K25
Liver anaesthesia and medicine	E19	F11	G14, G16	H18, K17, K21	J18

Category					
Neuro-anaesthesia and intensive care medicine		E28		H10, H14, H25, H28	J5, J8
Obstetric anaesthesia	D19, D23 A20, A24 B8, B17, C18, C22	E14, E18	F17 J4, J19, J27	G18, G20, G22	H2, H6, H19 K18, K22, K26
Paediatric anaesthesia and intensive care medicine	D12, D16, D20, D24 A13, A16, A21 B16, B24 C10, C14, C19, C23	E12, E17, E21, E26, E27	F5, F13, F14	G6, G9, J9, J14, J20, J24	H3, H15, H20, H24 K7, K12, K19, K23, K28
Acute and chronic pain management	D9, D13, D17, D21 A14, A18, A22 B10, B19, B27 C8, C11, C16, C20	E5, E15, E16, E20, E25	F3, F6, F10, F15, F19	G7, G10, G15 J1, J6, J10, J14, J15, J21	H21, H23, H27 K8, K13, K20
Regional anaesthesia	D7 A8, B23, B29, C6, C25	E29	F2, F8	G19, G24	H29, K4, K5
Trauma and orthopaedics	D10, D11, D26	E23		G1	H13
Transplant surgery	D18	E22			
Vascular anaesthesia	D29		F24, F27		

Foreword

Since man has existed there has been a basic, innate human drive to help the sick and, whenever possible, to return them to health. Superimposed on this constancy of intent has been a steady and progressive improvement in the ways of managing illness. Anaesthesia and its related specialties of intensive care medicine and pain management have been instrumental in allowing these developments to occur. In so doing they too have had to meet and overcome new problems. These range from those posed by rapid recovery case anaesthesia via safer childbirth to the management of increasingly complex patients with reduced physiological reserves.

Through its Charter, the Royal College of Anaesthetists has a public responsibility to ensure that this clinical progress is not only maintained, but also that the knowledge to achieve it is both taught and examined. It is to the credit of the specialty that for many years it has led the way in preparing trainees and fellows for the task ahead. Over time, the College examinations have undergone huge changes: the ones I sat in the late 1970s were very different from those of today. Throughout, however, the college has maintained a constant theme of making the examinations fit for purpose in the context of current and future practice. Whilst frustrating the many who have had to cope with this change, the effect has been of enormous public benefit.

This book has been produced in response to the recent variation of educational strategy in the Final Examination: the introduction of the scenario-based single best answer question. For me its publication is welcome on two grounds. Firstly, there is no doubt it will help those preparing for the examination: the coverage goes across the whole syllabus, the clinical settings are relevant and it encourages learning based in the reality of the clinical environment. Secondly, it is a book generated and completed by the energy of young anaesthetists, both trainees and consultants. With such enthusiasm in the ranks, the future of the specialty looks bright.

I wish the book, its authors and all those who read it the very best of luck for the future.

Peter Hutton PhD, FRCA, FRCP, FInst Mech E, Consultant Anaesthetist and Hon Professor, UHB FT and University of Birmingham

Foreword

The requirement by the General Medical Council that assessments of specialist competence include reliable tests of knowledge has secured the position of multiple choice examinations as an essential component in postgraduate specialist examinations. The challenge for those creating MCQs and for candidates taking the examination is that this device does not readily permit expression of the nuances and complexities of everyday medical practice. The thinking that underpins the construction of MCQs and the 'correct answer' is therefore of considerable importance. This compendium of single best answer questions intended as revision for the FRCA examination achieves this task admirably by providing detailed answers to each set of questions, which were themselves derived from, and refined by, experienced senior anaesthetists as well as by those in training. The questions are broad-ranging, and are relevant to intensive care medicine as well as to the confines of the operating theatre. They are also a valuable educational resource for tutorials, and a tool for continuing professional development.

Julian Bion FRCP, FRCA, FICM, MD Professor of Intensive Care Medicine, and Dean of the UK Faculty of Intensive Care Medicine, Queen Elizabeth Hospital, University of Birmingham

Introduction: angle of attack

Over the years, the FRCA examination has steadily evolved with many incremental changes that have resulted in a progressively more modern and fair test of knowledge. It has always been a rigorous examination in terms of depth and breadth, setting a high standard. The examination is embedded into the curriculum, with the primary and final being prerequisites for accessing intermediate and higher specialist training, respectively.

The oral examinations have moved towards a much more structured examination, where there is a pre-planned amount of material to cover. This has resulted in a more consistent examination that has greater validity and reliability. The wording and material of the MCQ examination have been continually updated to contain clearer and more concise language; older questions are continually modernized and occasionally removed from the college bank. Many mourn the loss of the negatively marked MCQ; however, this has all been to make the examination process fairer and more transparent.

The latest change to the Primary and Final FRCA is the introduction of the single best answer question. In the examination, 30 MCQ questions have been replaced by 30 Single Best Answer (SBA) questions.

The reason to use this book when preparing for the Final FRCA is that we believe this book offers the most realistic 'Final FRCA' experience. All the questions in this book have been written by practising anaesthetists with an interest in education and examination preparation. Each of these questions has then been carefully reviewed to ensure it is of the appropriate level for the FRCA and relevant to the syllabus.

The questions in this book have the appearance, construct and feel of a FRCA question. Unlike MCQs, there is a paucity of college questions in the public domain. This book will give the most life-like experience of the actual examination.

The MCQ can be used as a good test of knowledge, with a high degree of validity and reliability. However, this type of question can only test a small area of factual recall. It is more difficult to test understanding or application of that knowledge.

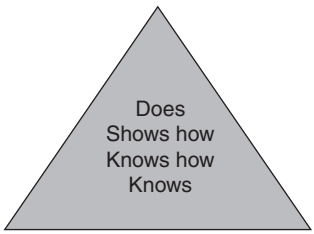
The SBA, however, allows for a deeper question that can require application of knowledge from a number of areas to allow the deduction of the correct answer. A realistic scenario can be created and varied in many ways, with multiple correct options then presented. It is up to the candidate then to select the best response.

When referring to Miller's triangle of clinical performance, multiple true–false (MTF) questions test the 'knows' and the properly constructed SBA will test the candidate's 'know how' and also 'show' level. It does this by allowing the setting of a scenario that may entail integrating knowledge from several domains and applying them to arrive at a best response.

In the SBA question all the responses will be correct; however, one will be the 'single best' response. This needs to be borne in mind when tackling such a question, and hence a good grounding with knowledge and clinical judgement is vital.

This type of question is already in use in undergraduate examinations and by the GMC in the assessment of poorly performing doctors. They also have a key role in overseas examinations such as FANZCA and US board examinations. An increasing number of UK-based examinations are incorporating these questions into their tests.

Introduction: angle of attack



Let's examine the anatomy of the SBA question.

Firstly, there will be a description setting a scenario. It will contain all the vital information required to answer the question. This is not designed to mislead, or trick the candidate.

Secondly, there will be a question. The types of question are: What is the next most important treatment? What would you do next? Ideally, the question will ask a 'what next?' type rather than a negative response such as 'which is least likely?'.

Thirdly, in the FRCA SBA there are five responses. The candidate must choose the single best option. Currently, this is scored with four marks for a correct response and zero for an incorrect response.

If one were to draw a hypothetical line with incorrect options at one end and correct options at the other, then all the options will be at the 'correct' end of the line. Choosing the single best will require integrating knowledge and the use of clinical judgement.

The approach to answering the question should be structured to have the highest likelihood of success when choosing the answer. The incorrect options are termed distractors, and that perfectly describes their function.

Wrong_____0_____Right
a. d. b. e. c.

Here option c. represents the best response.

If one imagines a hypothetical line that one 'sees' after a question: the responses can be placed on a line where 0 is neither right nor wrong with a 'wrong' end of the line and a 'right' end of the line. The answers in a SBA will not be wrong (as a statement in themselves), but could be wrong in the context of a question. Much more likely is that the responses will ALL be correct responses, but one will be better than the others.

The challenge is to pick the 'single best answer'. This type of question is designed to reward the knowledgeable candidate. Hence there is no substitute for gaining a good base knowledge. Beyond this, certain approaches will help to identify the correct response quickly.

The cover up

Initially, when reading the scenario, cover the answers. Read the scenario carefully and then read the question. Without revealing the options, think about the best answer to that question.

Once you have done that, uncover the options. If what you thought is in that list, then that is the answer. Mark it and move on.

Discount the unlikely

If your answer is not amongst the options, then read all the options. You now need to start discounting the less likely options. It will help to re-read the scenario and question; then examine the options.

The easiest to discount will be statements that are untrue. A well-written SBA will try to avoid having this; nonetheless, some questions may have these and it should be straightforward for an informed candidate to discount them.

Protocols and guidelines make good material on which to base SBA questions. Often, the options will have distractors that contain elements that help with rejecting the incorrect responses, for example, an odd drug or dosing, incorrect next step or escalation of treatment. It is in these types of scenario that one needs to be familiar with standard UK practice.

Narrow the odds

Very occasionally even the most well-read candidate will come across a question that may be difficult to answer. In such situations a best guess may be needed. The chance of getting the correct answer can be improved by reducing the number of responses to guess from. There are often one or two options that may be relatively easily discounted, leaving one to guess from a pool of 2–3 statements rather than 5.

As in MCQ questions, look for statements such as 'always' or 'never'; or similar strong elements. These responses are rarely correct.

If one cannot narrow any of the options, then leave the question and move onto the rest of the paper. One may come across another question or a piece of information that helps you either to find the answer, or to narrow the options.

Ultimately, there is no substitute for a good background knowledge, based on strong basic science. In my experience the candidates who seem to struggle the most are those who, in their preparation for the FRCA, retreat completely into studying, neglecting the real clinical world where much of our knowledge is reinforced by clinical practice.

One's reading should include the RCOA's CEPD journal that accompanies the BJA. This is not just a rich source of quality information about the science and practice of anaesthesia, but is also a first port of call for examiners looking for inspiration to formulate questions for the FRCA. Likewise, protocols such as ALS, ATLS, BTS (asthma), ARDSnet and NICE provide rich sources for question writers.

After doing all the required reading and preparation, one must practise doing these types of question before sitting the exam for real. This book will offer the most realistic simulation of the SBA component to the correct standard in the Final FRCA.

Good luck, and study to aim for a first-time pass.

Khalid Hasan

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