1,000 Practice MTF MCQs for the Primary and Final FRCA

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Foreword

There have been a number of single best answer books published recently, but there is a paucity of new true–false multiple-choice books. Whilst the internet provides a welcome educational resource, it is often unregulated and of variable quality and a book such as this, which is accurately researched, is a valuable addition to the bookshelf. The ethos of this book is problem-based learning, which has many advantages over the traditional textbook in that it provides information in digestible bite-sized chunks.

This book has 1000 true–false multiple choice questions. The 600 basic science questions comprise 150 in each of anatomy, physiology, pharmacology and physics and will be useful for candidates sitting both the primary and the final FRCA. The 400 clinical questions are geared toward final FRCA candidates, making this a unique MCQ book which can be used throughout the examination journey.

Whilst the questions are useful for exam practice, the answers provide a wealth of information, including key diagrams, and this publication is therefore a useful textbook in its own right. It can be used by trainees and trainers as a base of knowledge for viva practice and should be available in every department.

I congratulate Dr Ebrahim and his co-authors on the production of this book – which I strongly recommend to all anaesthetists.

Dr Tina McLeod MBBS FRCA
Consultant Anaesthetist, Heart of England NHS Foundation Trust

Preface

Revising for exams can be a period of mixed emotions. Some enjoy the challenge of learning new material, but a great many find it a time of stress. Let us make that time easier for you.

One quiet afternoon in the coffee room, I heard some of my dear trainees stressing over some *bad questions.* It is true that some questions are poorly written – not in this book, I hope, as all of our questions have been written by seasoned educationalists and peer reviewed by many exam candidates – but nevertheless, books and the internet are littered with ambiguous questions. Indeed, the *right* answer can change with time. However, I tried to reassure them that any question that has caused them to discuss these ambiguities would surely have resulted in them gaining more knowledge. These words appeared to help, although I knew that any added stress at this difficult time was far from welcome.

Studying for exams is as much about having the right positive attitude as it is about cramming information!

The basic sciences for the FRCA exam are well defined. This book has 150 questions for each of the four basic sciences – anatomy, physics, pharmacology and physiology. The questions have been written to cover the entire syllabus. It is our suggestion that you only start practising MCQs once you have spent appropriate time reading the core material.

Find some quiet time to complete a predetermined number of questions, under exam conditions. Mark them, and then go through your results. For stems in which you are scoring 4s and 5s, you clearly have a good grasp of the topic. Pat yourself on the back and move on. For stems in which you are scoring 3 or less, after reading our explanation, spend just a few more minutes concentrating on reading more about that topic. We do not advise going back to the drawing board and spending hours rereading the entire topic, as this will not be the best use of your time. Five minutes of targeted reading usually yields the majority of information needed for that question.

Use this technique for the clinical questions as well.

The FRCA examination-setters are not trying to trick you. The MCQ exam is a test of knowledge. If you find a particular question easy, it is probably because you have got the knowledge. If a question is difficult, spend some time reading that topic. In our experience, time well spent always pays off. Keep a positive mental attitude.

That quiet afternoon, a few of us made the decision to compile the best of our questions, and embark upon another project. I hope this book is helpful to you. And please remember, one day you'll be the teacher.

Good luck.

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Abbreviations

A&E	accident and emergency
AAA	abdominal aortic aneurysm
AAGBI	Association of Anaesthetists of Great Britain and Ireland
ABG	arterial blood gas
ABP	arterial blood pressure
ACE	angiotensin-converting enzyme
ACh	acetylcholine
ACT	activated clotting time
ACTH	adrenocorticotrophic hormone
ADCC	antibody-dependent cell-mediated cytotoxicity
ADH	antidiuretic hormone
ADHD	attention deficit hyperactivity disorder
AFE	amniotic fluid embolism
AFLP	acute fatty liver of pregnancy
AFOI	awake fibreoptic intubation
AKI	acute kidney injury
ALF	acute liver failure
ALI	acute lung injury
ALP	alkaline phosphatase
ALS	advanced life support
ALT	alanine aminotransferase
AMPA	α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid
ANP	atrial natriuretic peptide
ANS	autonomic nervous system
AOP	apnoea of prematurity
APACHE	Acute Physiology And Chronic Health Evaluation
APTT	activated partial thromboplastin time
ARDS	acute respiratory distress syndrome
AS	aortic stenosis
ASA	American Society of Anesthesiologists
ASD	atrial septal defect
ASIS	anterior superior iliac spine
AST	aspartate aminotransferase
ATLS	advanced trauma life support
ATP	adenosine triphosphate
AV	atrioventricular
BBB	blood–brain barrier
BCIS	bone cement implantation syndrome
BG	blood glucose
BiPAP	bilevel positive airway pressure
BIS	bispectral index
BMI	body mass index
BMR	basal metabolic rate

BP	blood pressure
BSA	burn surface area
BTS	British Thoracic Society
BZD	benzodiazepine
CABG	coronary artery bypass graft
cAMP	cyclic adenosine monophosphate
CBF	cerebral blood flow
CDH	congenital diaphragmatic hernia
CEPOD	Confidential Enquiry into Perioperative Deaths
CFAM	cerebral function analyzing monitor
cGMP	cyclic guanosine monophosphate
CHEOPS	Children's Hospital of Eastern Ontario Pain Scale
CIM	critical illness myopathy
CIP	critical illness polyneuropathy
cLMA	classic laryngeal mask airway
CLP	cleft lip and palate
CMAP	compound muscle action potential
$CMRO_2$	cerebral metabolic oxygen requirement
CMV	cytomegalovirus
CN	cranial nerve
CNB	central neuraxial block
CNS	central nervous system
CO	cardiac output
COETT	cuffed oral endotracheal tube
COHb	carboxyhaemoglobin
COMT	catechol-*O*-methyl transferase
COPD	chronic obstructive pulmonary disease
COX	cyclo-oxygenase
CP	cerebral palsy
CPAP	continuous positive airway pressure
CPET	cardiopulmonary exercise testing
CPD	citrate phosphate dextrose
CPR	cardiopulmonary resuscitation
CPSP	chronic postsurgical pain
CRF	continuous radiofrequency
CRH	corticotropin-releasing hormone
$CRMO_2$	cerebral metabolic rate for oxygen
CRPS	complex regional pain syndrome
CRT	cathode ray tube
CS	caesarean section
CSE	combined spinal–epidural
CSF	cerebrospinal fluid
CT	computerized tomography
CTG	cardiotocography
CTPA	computerized tomography pulmonary angiography
CTZ	chemoreceptor trigger zone
CVC	central venous catheter

CVO	combined ventricular output
CVP	central venous pressure
CVS	cardiovascular
CXR	chest X-ray
CYP	cytochrome P450
DA	ductus arteriosus
DAG	diacylglycerol
DAS	Difficult Airway Society
DI	diabetes insipidus
DJ	duodenojejunal
DLCO	diffusing capacity of the lungs for carbon monoxide
DLT	double lumen tube
DNA	deoxyribonucleic acid
DOPA	dihydroxyphenylalanine
DP	dorsalis pedis
2,3-DPG	2,3-diphosphoglycerate
DPP4	dipeptidyl peptidase 4
DVT	deep vein thrombosis
DXA	dual-energy X-ray absorptiometry
EBP	epidural blood patch
ECF	extracellular fluid
ECG	electrocardiogram
ECMO	extracorporeal membrane oxygenation
ECST	European Carotid Surgery Trial
ECT	electroconvulsive therapy
ED	emergency department
ED_{50}	effective dose 50%
EDV	end diastolic volume
EEG	electroencephalogram
EMG	electromyography
EMLA	eutectic mixture of local anaesthetics
ENT	ear nose and throat
ESV	end systolic volume
ESWL	extracorporeal shock-wave lithotripsy
$ETCO_2$	end tidal carbon dioxide
ETT	endotracheal tube
EVAR	endovascular aortic aneurysm repair
FAD^+	flavin adenine dinucleotide (oxidized form)
FADH	flavin adenine dinucleotide (reduced form)
FBC	full blood count
FCP	final common pathway
FDG	fluorodeoxyglucose
FEF	forced expiratory flow
FEV1	forced expiratory volume in 1 second
FFP	fresh frozen plasma
FiO_2	fraction of inspired oxygen
FRC	functional residual capacity

FSH	follicle-stimulating hormone
FVC	forced vital capacity
GA	general anaesthetic
GABA	γ amino-butyric acid
GBS	Guillain–Barré syndrome
GCS	Glasgow coma score
GDP	guanosine diphosphate
GFR	glomerular filtration rate
GH	growth hormone
GHB	γ-hydroxybutyrate
GI	gastrointestinal
GLP	glucagon-like peptide
GnRH	gonadotropin-releasing hormone
GORD	gastro-oesophageal reflux disease
GPCR	G-protein-coupled receptor
GTN	glyceryl trinitrate
GTP	guanosine triphosphate
GU	genitourinary
HALF	hyperacute liver failure
Hb	haemoglobin
HbA	adult haemoglobin
HbF	fetal haemoglobin
hCG	human chorionic gonadotropin
HDL	high-density lipoprotein
HDU	high-dependency unit
HELLP	haemolysis, elevated liver enzymes and low platelets
HES	hydroxyethyl starch
HFOV	high-frequency oscillatory ventilation
HII	high-impact interventions
HIV	human immunodeficiency virus
HLA	human leucocyte antigen
HLHS	hypoplastic left heart syndrome
HME	heat and moisture exchanger
HOCM	hypertrophic obstructive cardiomyopathy
hPL	human placental lactogen
HPV	hypoxic pulmonary vasoconstriction
HR	heart rate
HRT	hormone replacement therapy
5-HT	5-hydroxytryptamine
HZ	herpes zoster
IABP	intra-aortic balloon pump
IAP	intra-abdominal pressure
IBW	ideal body weight
ICA	internal carotid artery
ICD	intercostal chest drain
ICF	intracellular fluid
ICP	intracranial pressure

ICU	intensive care unit
IE	infective endocarditis
IF	intrinsic factor
IJV	internal jugular vein
IM	intramuscular
INR	international normalized ratio
IOP	intraocular pressure
IP_3	inositol triphosphate
IPPV	intermittent positive pressure ventilation
ISF	interstitial fluid
ITP_3	inositol triphosphate
IV	intravenous
IVC	inferior vena cava
IVF	intravascular fluid
LA	local anaesthetic
LAD	left anterior descending artery
LAP	left atrial pressure
LBBB	left bundle branch block
LD_{50}	lethal dose 50%
LDH	lactate dehydrogenase
LFJV	low-frequency jet ventilation
LH	luteinizing hormone
LIF	left iliac fossa
LMA	laryngeal mask airway
LMWH	low molecular weight heparin
LOAF	lateral two lumbricals, opponens pollicis, abductor pollicis brevis and flexor pollicis brevis
LOR	loss of resistance
LOS	lower oesophageal sphincter
LRA	locoregional anaesthesia
LV	left ventricle
LVEDV	left ventricular end diastolic volume
LVEF	left ventricular ejection fraction
LVESV	left ventricular end systolic volume
LVH	left ventricular hypertrophy
LVRS	lung volume reduction surgery
MA	maximum amplitude
MAC	minimum alveolar concentration
MAO	monoamine oxidase
MawP	mean airway pressure
MDMA	3,4-methylenedioxy-*N*-methylamphetamine (Ecstacy)
MEN	multiple endocrine neoplasia
MEP	motor evoked potentials
MET	metabolic equivalent
MG	myasthenia gravis
MH	malignant hyperpyrexia
MHRA	Medicines and Healthcare Products Regulatory Agency

MI	myocardial infarction
MPAP	mean pulmonary artery pressure
MR	magnetic resonance
MRI	magnetic resonance imaging
NAD^+	nicotinamide adenine dinucleotide (oxidized form)
NADH	nicotinamide adenine dinucleotide (reduced form)
NAP3	Third National Audit Project
NASCET	North American Symptomatic Carotid Endarterectomy Trial
NCA	nurse-controlled analgesia
NDMR	non-depolarizing muscle relaxant
NDNMB	non-depolarizing neuromuscular block
NEC	necrotizing enterocolitis
NG	nasogastric
NICU	neonatal intensive care unit
NK	neurokinin
NKCC	Na-K-2Cl co-transporter
NMDA	*N*-methyl-D-aspartate
NMJ	neuromuscular junction
NNBC	National Network for Burn Care
NNT	number needed to treat
N_R	Reynold's number
NRS	numerical rating scale
NSAID	non-steroidal anti-inflammatory drug
NTS	nucleus tractus solitarius
NYHA	New York Heart Association
OA	osteoarthritis
ODP	operating department practitioner
OHDC	oxygen–haemoglobin dissociation curve
OLV	one-lung ventilation
ORIF	open reduction internal fixation
OSA	obstructive sleep apnoea
PA	pulmonary artery
PAC	pulmonary artery catheter
p_aCO_2	arterial partial pressure of carbon dioxide
p_ACO_2	alveolar partial pressure of carbon dioxide
PAFC	pulmonary artery flotation catheter
p_aO_2	arterial partial pressure of oxygen
p_AO_2	alveolar partial pressure of oxygen
PAP	pulmonary arterial pressure
PAWP	pumonary artery wedge pressure
PCA	patient-controlled analgesia
PCEA	patient-controlled epidural analgesia
PCI	percutaneous coronary intervention
$pcjO_2$	conjunctival oxygen tension
PCWP	pulmonary capillary wedge pressure
PD	Parkinson's disease
PDA	patent ductus arteriosus

PDE	phosphodiesterase
PDPH	post-dural-puncture headache
PEEP	positive end-expiratory pressure
PEFR	peak expiratory flow rate
PET	positron emission tomography
PFO	patent foramen ovale
PGA	postgestational age
PGE_2	prostaglandin E_2
PGI_2	prostacyclin
PH	pulmonary hypertension
PHN	postherpatic neuralgia
PICU	paediatric intensive care unit
PIP_2	phosphatidylinositol
PMCS	perimortem caesarean section
PNMT	phenylethanolamine *N*-methyl transferase
PNS	peripheral nervous system
POCD	postoperative cognitive dysfunction
PONV	postoperative nausea and vomiting
PPAR	peroxisome proliferator-activated receptor
PPH	postpartum haemorrhage
PPI	proton pump inhibitor
ppoFEV1%	predicted postoperative FEV1 percentage
PRF	pulsed radiofrequency
PRL	prolactin
PSIS	posterior superior iliac spine
PSNS	parasympathetic nervous system
PT	prothrombin time
PTH	parathyroid hormone
PVR	pulmonary vascular resistence
QAI	quaternary ammonium ion
QTc	corrected QT
RA	right atrium
RCOG	Royal College of Obstetricians and Gynaecologists
REM	rapid eye movement
RER	respiratory exchange ratio
RF	radiofrequency
RMP	resting membrane potential
RMS	root mean square
RNA	ribonucleic acid
ROS	reactive oxygen species
ROSC	return of spontaneous circulation
RQ	respiratory quotient
RR	respiratory rate
RRT	renal replacement therapy
RSI	rapid sequence induction
rSO_2	regional cerebral oxygen saturation
RTA	road traffic accident

RUL	right upper lobe
RUQ	right upper quadrant
RV	right ventricle
RVLM	rostral ventrolateral medulla
RVOT	right ventricular outflow obstruction
SA	sinoatrial
SAD	supraglottic airway device
SAH	subarachnoid haemorrhage
SCS	spinal cord stimulation
SCUF	slow continuous ultrafiltration
SE	status epilepticus
SIP	sympathetically independent pain
SIRS	systemic inflammatory response syndrome
SLED	sustained low-efficiency dialysis
SMP	sympathetically maintained pain
SNAP	sensory nerve action potential
SNP	sodium nitroprusside
SNR	signal-to-noise ratio
SP	stump pressure
SPECT	single-photon emission computed tomography
SSEP	somatosensory evoked potential
STP	standard temperature and pressure
SVP	saturated vapour pressure
SVR	systemic vascular resistance
SVT	supraventricular tachycardia
T_3	triiodothyronine
T_4	thyroxine
TACO	transfusion-associated circulatory overload
TAP	transversus abdominis plane
TBSA	total body surface area
TCI	target-controlled infusion
TCD	transcranial Doppler ultrasound
TEG	thromboelastogram
TENS	transcutaneous electrical nerve stimulation
TFPI	tissue factor pathway inhibitor
TH cells	T-helper cells
TIA	transient ischaemic attack
TIVA	total intravenous anaesthesia
TLC	total lung capacity
TMJ	temporomandibular joint
TN	trigeminal neuralgia
TOF	train of four *or* tracheo-oesophageal fistula
TPN	total parenteral nutrition
TRALI	transfusion-related acute lung injury
TRAM	transverse rectus abdominis myocutaneous
TRH	thyrotropin-releasing hormone
TRVP	transient receptor potential vanilloid

TSH	thyroid-stimulating hormone
TURP	transurethral resection of the prostate
UFH	unfractionated heparin
URTI	upper respiratory tract infection
USS	ultrasound scan
VAE	venous air embolism
VAS	visual analogue scale
VC	vital capacity
V_D	volume of distribution
VF	ventricular fibrillation
VRIII	variable rate intravenous insulin infusion
VRS	visual rating scale
VSD	ventricular septal defect
VT	ventricular tachycardia
VTE	venous thromboembolism
VZV	varicella zoster virus
WFNS	World Federation of Neurosurgeons
WPW	Wolff–Parkinson–White syndrome