



GET THROUGH

MCEM Part B:
Data Interpretation
Questions

Mathew Hall
Chetan R Trivedy
Sam Thenabadu

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MCEM Part B: Data Interpretation Questions

EDITED BY

Mathew Hall BM BCh PhD MCEM
Specialty Doctor in Emergency Medicine
Princess Royal University Hospital
Kent, UK

Sam Thenabadu MBBS MRCP DRCOG DCH Dip Clin Ed FCEM
Consultant Adult & Paediatric Emergency Medicine
Princess Royal University Hospital
Kent, UK

Chet R Trivedy BDS FDS RCS (Eng) MBBS PhD MCEM
Research Fellow
London Emergency Academic Research Network (LEARN)
London School of Emergency Medicine
London, UK



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CONTENTS

Contributors	ix
Preface	xi
Acknowledgements	xiii
Abbreviations	xiv
1. Introduction	1
Mathew Hall, Sam Thenabadu and Chet R Trivedy	
2. Resuscitation	9
Harith Al Rawi	
3. Cardiac Emergencies	23
Sam Thenabadu	
4. Respiratory Emergencies	47
Mathew Hall and Sam Thenabadu	
5. Neurological Emergencies	65
Mathew Hall	
6. Gastroenterology	81
Malcolm Tunnicliff	
7. Renal and Electrolyte Emergencies	93
Emma Townsend	
8. Endocrine emergencies	111
Chet R Trivedy	

9. Haematology and Oncology Mitesh Davda	119
10. Infectious Disease and Sepsis Arif Ahmad	133
11. Paediatric Emergencies Sam Thenabadu	151
12. Psychiatric and Legal Emergencies Mathew Hall	173
13. ENT and Maxillofacial Emergencies Chet R Trivedy	187
14. Dermatology and Rheumatology Sam Thenabadu and Mathew Hall	205
15. Ophthalmic Emergencies Mathew Hall	225
16. Obstetric and Gynaecological Emergencies Sam Thenabadu	237
17. Pain and Anaesthetics Mathew Hall	249
18. Surgical Emergencies Jane Richmond	265
19. Toxicology and Poisoning Shumontha Dev	287

20. Trauma and Orthopaedics

299

Elaine Harding and Mathew Hall

21. Environmental Emergencies

325

Shumontha Dev

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CONTRIBUTORS

Arif Ahmad MBBS

Associate Specialist in Emergency Medicine
Princess Royal University Hospital
Kent, UK

Harith Adil Tawfiq Al Rawi MBChB DCH FRCS Ed FCEM

Consultant Emergency Medicine
St Thomas' Hospital
London, UK

Mitesh Davda MBBS MRCS FCEM

Consultant in Emergency Medicine
Princess Royal University Hospital
Kent, UK

Shumontha Dev BSc (Hons) MBBS MRCS (Ed) FCEM

Consultant in Emergency Medicine
Guy's and St Thomas' Hospitals NHS Foundation Trust
London, UK

Mathew Hall BM BCh PhD MCEM

Specialty Doctor in Emergency Medicine
Princess Royal University Hospital
Kent, UK

Elaine Harding MBBS MRCS FCEM

Emergency Department Consultant
University Hospital Lewisham
London, UK

Jane Richmond BSc (Hons) MBBS MRCS FCEM

Consultant in Emergency Medicine
Croydon University Hospital
London, UK

Sam Thenabadu MBBS MRCP DRCOG DCH Dip Clin Ed FCEM
Consultant Adult and Paediatric Emergency Medicine
Princess Royal University Hospital
Kent, UK

Emma Townsend MBBS BSi DRCOG MRCP FCEM
Consultant in Emergency Medicine
Tunbridge Wells Hospital
Tunbridge Wells
Kent, UK

Malcolm Tunncliffe MB BS MRCSEd FCEM DipMedTox
Consultant and Clinical Lead in Emergency Medicine
King's College Hospital
London, UK

Chet R Trivedy BDS FDS RCS (Eng) MBBS PhD MCEM
Research Fellow
London Emergency Academic Research Network (LEARN)
London School of Emergency Medicine
London, UK

PREFACE

The College of Emergency Medicine (CEM) sets a structured answer question (SAQ) paper as part of the both its membership (MCEM) and fellowship (FCEM) examinations. These papers examine the whole breadth of the current Emergency Medicine curriculum in the form of short clinical scenarios, followed by a series of questions probing the candidate's clinical knowledge and data interpretation skills. Many candidates find negotiating CEM examination SAQs particularly challenging, in part due to the immense amount of material potentially examined at each diet but also the often unappreciated need for strict examination technique when answering each and every question. The aspiring candidate's problems are further compounded by the marked absence of helpful resources focused on the MCEM and FCEM SAQ examinations, particularly the lack of any practice materials.

We have written this book, *Get Through MCEM Part B: Data Interpretation Questions*, to fill that void. There follows more than 160 practice SAQ questions exploring all the corners of the CEM curriculum but focused on the most commonly examined areas. The authors and contributors have used their extensive experience teaching emergency medicine trainees to construct an informative, up-to-date and effective exam practice text. All areas of the curriculum relevant to the MCEM Part B exam are covered, all possible data interpretation included and a whole chapter is devoted to exam technique with advice on answering individual SAQs to gain maximum marks. Each question is followed by a detailed yet focused answer and discussion of the topic and further reading is recommended where relevant. Each chapter starts with a rundown of the important topics to revise and points to the knowledge necessary to succeed, including referencing many of the important guidelines used in everyday Emergency Department (ED) practice. All in all, we present an essential study guide and practice question book for all those serious about passing the MCEM Part B exam.

All though primarily aimed at those sitting the UK MCEM Part B examination, we believe this book should serve a wider audience and provides a learning resource not only for UK emergency medicine trainees but also all doctors at all levels of training in all countries who deal with acute emergencies in the unselected patient population presenting to their hospital. We hope you find this book useful for both exam revision and, more importantly, improving your knowledge and skill in the practice of Emergency Medicine.

Mathew Hall
Sam Thenabadu
Chet R Trivedy

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Mathew Hall

Many thanks to my colleagues who have tolerated my often over-enthusiastic approach to medical education and desire to improve the delivery of high-quality emergency medicine, to my parents for making me believe in pushing myself on to do more, and most importantly, to my wonderful tolerant and ever-understanding wife Molly who has suffered hours on end of me discussing cases with her – couldn't have done it without you.

Sam Thenabadu

For me a career in emergency medicine isn't just a job, it's a much loved hobby which I am privileged to get paid for, and it has given me great pleasure and satisfaction to be involved with this publication. I hope trainees planning to sit the CEM examinations will find it a useful resource. I am grateful for the support of all my colleagues for their time and support. I would like to say a special thank you to Tim Harris, Geoff Hinchley, Ian Stell and Chris Lacy for their extraordinary commitment to trainees, academia and being great role models. I would like to dedicate this book to my late father Mr Ramesh H Trivedy to whom I owe more than I can ever hope to repay.

Chet R Trivedy

LIST OF ABBREVIATIONS

(n.b. these are abbreviations used regularly in this book and is not meant to represent the list of abbreviations approved by the College for use in the MCEM exam)

A-a	alveolar-arterial	DIC	disseminated intravascular coagulation
ABG	arterial blood gas	EBV	Epstein barr virus
AFB	acid fast bacilli	ED	Emergency Department
AIDS	acquired immunodeficiency syndrome	ELISA	enzyme-linked immunoabsorbant assay
ALS	Advanced Life Support	FBC	full blood count
AP	antero-posterior	g	gram
APLS	Advanced Paediatric Life Support	GCS	Glasgow coma score
ATLS	Advanced Trauma Life Support	GFR	glomerular filtration rate
AV	atrio-ventricular	GI	gastrointestinal
bd	twice a day	ICP	intracranial pressure
BE	base excess	IM	intramuscular
BiPAP	bi-level positive airways pressure ventilation	ITU	intensive therapy unit
BMI	body mass index	IV	intravenous
BNF	British National Formulary	IVI	intravenous infusion
BSA	body surface area	IVU	intravenous urethrogram
BTS	British Thoracic Society	kPa	kilopascals
CEC	Clinical Effectiveness Committee	LBBB	left bundle branch block
CEM	College of Emergency Medicine	LFT	liver function tests
CK	creatinine kinase	LMP	last menstrual period
COPD	chronic obstructive pulmonary disease	LP	lumbar puncture
CPAP	continuous positive airway pressure	MC&S	microscopy, culture and sensitivities
CRT	capillary refill time	MCPJs	metacarpophalangeal joints
CSF	cerebrospinal fluid	MCV	mean corpuscular volume
CT	computed tomography	mg	milligram
		mcg	micrograms
		MRC	medical research council
		MRI	magnetic resonance imaging
		MRSA	methicillin resistant <i>staphylococcus aureus</i>



MSE	mental state examination	qds	four times a day
MSU	mid stream urine	RCOG	Royal College of Obstetrics and Gynaecology
NAI	non-accidental injury	RCP	Royal College of Physicians
NBM	nil by mouth	RCPC	Royal College of Paediatricians and Child Health
NICE	National Institute for Clinical Excellence	RSV	Respiratory Syncytial Virus
NIV	noninvasive ventilation	RTA	road traffic accident
NPIS	National Poisons Information Service	sc	subcutaneous
NSAIDs	nonsteroidal anti-inflammatory drugs	SI	sacro-ileac
OCP	oral contraceptive pill	SIGN	Scottish Intercollegiate Guidelines Network
OPG	orthopantomogram	SIRS	systemic inflammatory response syndrome
od	once daily	SLE	systemic lupus erythematosus
PA	postero-anterior	TB	tuberculosis
PCI	percutaneous coronary intervention	TCA	tricyclic antidepressant
PEA	pulseless electrical activity	tds	three times a day
PEFR	peak expiratory flow rate	TFT	thyroid function tests
PICU	paediatric intensive care unit	U&E	urea and electrolytes
PIPJ	proximal interphalangeal joints	URTI	upper respiratory tract infection
po	per os (by mouth)	UTI	urinary tract infection
pr	per rectum	VZV	varicella-zoster virus
PSA	prostate specific antigen	WCC	white cell count
pv	per vaginum		

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Mathew Hall, Sam Thenabadu and Chet R Trivedy

The College of Emergency Medicine Part B membership examination (MCEM Part B) tests the data interpretation skills of aspiring emergency physicians in the form of short answer questions (SAQs). The typical SAQ will have a short clinical scenario called the 'stem' and then a series of questions either relating directly to the scenario in the stem or possibly of a more general nature (Box 1.1). Clinical data is frequently included in the stem but may also be put into any of the questions which follow. Questions aim to test candidates' clinical knowledge and patient management skills.

Box 1.1 Structure of a typical MCEM SAQ

A 63-year-old man with known emphysema arrives by ambulance complaining of shortness of breath and worsening exercise tolerance over the past two days. His initial observations are pulse 98 bpm and regular, blood pressure 156/88 mmHg and respiratory rate 26/min. {The stem}

On chest auscultation, he has poor air entry and audible wheeze.

His arterial gas on air is shown below {Including data}

pH	7.48
pCO ₂	4.9 kPa
pO ₂	7.7 kPa
BE	-2.9.

- | | | |
|---|-----|-----------------|
| a. Interpret the arterial blood gas given above. | [1] | {Questions a–d} |
| b. Give 2 causes of acute exacerbation of COPD. | [2] | |
| c. Give four treatments you would give this man initially. | [4] | |
| d. Give three indications for empirical antibiotics in an exacerbation of COPD. | [3] | |

At the time of writing, the MCEM Part B exam contains 16 SAQ questions to be answered in two hours. In recent diets of the Part B exam, SAQs set by the College of Emergency Medicine (CEM) have become standardized with each having a stem and four related questions. Each question is designed to be answered by a short-list of the most appropriate responses, each response a single word or few words in length, or by a brief descriptive sentence at most. All marking is positive, meaning that marks are never removed for wrong answers – no matter how wrong!

It is fair to say that the more clinical experience a candidate has, the better prepared they will be for the MCEM Part B exam. Simply put, the more ECG's they have seen, more trauma X-rays reviewed and, in the final analysis, more patients they have managed, then the more likely a candidate is to recognize the clinical scenarios and data presented in SAQ questions. So, as with any postgraduate medical exam, the best preparation is through abundant clinical contact, asking for help when new territory is encountered and then, in academic time, further reading to consolidate learning.

In addition, however, revision books like this one have an important part to play in exam preparation. Practice questions help fill gaps in candidates' knowledge – things they may not have seen in clinical practice – as well as drawing attention to areas of particular importance and which are, therefore, more likely to be examined. Importantly, answering mock questions also allows candidates to develop and hone the specific skills required for success in exams and which are not necessarily learnt elsewhere. In the case of the Part B SAQs we suggest these are:

- extracting the important or key information from the clinical scenario/question stem
- interpreting clinical data appropriately
- writing clear, concise and precise answers to all questions
- time management.

This book presents 160 practice questions for the MCEM Part B exam and, in so doing, provides a valuable revision aid for the most important areas of the CEM syllabus. Furthermore, when used with the advice given in the next two sections of this chapter – 'answering SAQ questions' and 'How to use this book' – these questions inculcate the exam skills and techniques listed above and that can make all the difference between pass and fail in the exam itself.

Answering SAQ Questions

Unlike MCQ style questions, where answers are given as a single mark in a box indicating true or false, SAQs challenge the candidate with an empty line or answer box in which anything can be written. Indeed, over and above possessing the knowledge to answer the question correctly, a certain amount of exam technique is also required to encapsulate that knowledge into a short answer containing exactly what the examiner hopes to see to award maximum marks. This section starts with some simple exam tips and then tackles the more difficult topic of exactly how to answer the question!

As you will have been told many times before, always read the questions carefully. The clinical scenarios presented as stems are usually fairly straightforward and are certainly not designed to catch you out. Pay attention to the key points in the clinical description:

- is the patient well or unwell and requiring resuscitation?
- what are the salient features of the history and/or examination?
- if observations are given what do they indicate about the patient?
- is there anything about this patient which might influence your approach,

both to diagnosis and/or management, e.g., pregnancy, diabetes, renal failure or particular medications or allergies?

- look at any data included with the stem to see what light it may throw on the clinical scenario, in particular – does it indicate a certain diagnosis is likely?

Importantly, however, do not panic at this stage if you are either unclear about what the clinical scenario is getting at, or how to interpret the data given. Wait to see what the questions actually ask for. Often, further information is given as part of the questions while, in many other cases, the question can be answered without relying on the stem to provide the crucial insight.

Read each question carefully and think what exactly is being asked for. This is more important than it sounds – consider the following:

- does it ask for symptoms, signs or features of a particular condition? Each has different medical meanings. Symptoms are the problems which the patient notices or experiences. Clinical signs are observed or elicited by the examining doctor and are therefore objective. Features can be either.
- treatments versus management. Treatments are specific interventions designed to improve outcome. Management is a broader concept encompassing all actions necessary to effectively deal with a patient within a given healthcare setting. Thus, management includes, for example, disposal of the patient from the care of the Emergency Department, as well as resuscitation status decisions, both clearly aspects of care of which would not normally be considered treatments.
- risk factors vs causes. Risk factors increase the probability of an event occurring. Causes have a direct causal relationship to a specific event. For example, hyperlipidaemia is a risk factor for myocardial infarction through its promotion of atheromatous coronary artery disease but rupture of the atheromatous plaque is a cause.

Then, look for how the question asks for the answer. Again, this is often overlooked – consider the following:

- give, list or describe. Make sure you do as requested.
- often a question asks for a specific number of responses. For example, ‘list three causes of chest pain’ or ‘give four complications of myocardial infarction’. Most importantly, make sure you answer with **exactly** the number of responses requested. Giving too few guarantees lost marks but giving too many also has pitfalls. If the question asks for a list of three causes of chest pain, and the candidate writes a list of five in response, only the first three will be marked and the last two ignored, whether right or wrong. Thus, the best approach is to give exactly the number of responses requested and make sure they are the ones you consider most likely to be correct.
- guidance is sometimes given on exactly how the question is to be answered. For example, ‘what specific treatment would you give to this patient (include the **dose** and **route** of administration of any drugs in your answer)?’ Alternatively, ‘write a **four-point** management plan for this patient.’ Make sure you do exactly as the question asks to gain all allotted marks.