

MASTERPASS

Final FRCR Part A Modules 4-6 Single Best Answer MCQs

the SRT collection of
600 questions with
explanatory answers

Edited by Robin Proctor

Foreword by Joanna Fairhurst



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MODULES 4–6
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THE SRT COLLECTION OF 600 QUESTIONS WITH
EXPLANATORY ANSWERS

Edited by

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Foreword

It is never easy to decide how best to prepare for an examination: should one concentrate on reading detailed textbooks in the hope that a sufficient proportion of the facts are retained? Are books written as examination aides enough? Should a candidate peruse the recent literature in case 'hot topics' are covered in the questions? Or in this age of increasing reliance on electronic information, should the candidate place their hopes in electronic teaching files? Whatever their personal preference, it is likely that most candidates will turn to examples of examination questions in order to help gauge their preparedness for a test and assess their progress in acquiring the necessary knowledge. The number of publications available to radiologists in training to help them prepare for the Part 2A examination for the FRCR is an indication of how popular these books are as an examination aide. Over the years these texts have been able to draw on the recollections of questions encountered by past candidates and on the expertise acquired by question-setters from a variety of backgrounds. Neither of these resources is available to the candidate about to sit the new single best answer format that the Royal College of Radiologists has adopted for the new-style 2A examination modules. This style of question has been used successfully in the medical world for a number of years, but is novel and unexplored in the context of the FRCR.

Thankfully the authors of this book have responded to the challenge of producing a volume that can provide candidates with experience of attempting to answer questions in this new format. They have collaborated to develop a large number of questions in the new style and have organised these into papers along the lines of the six 2A modules, to give readers the best chance of reproducing the feel of the new examination before sitting the real thing. This has indeed been a significant challenge: not only have the authors had to develop their own question-writing skills along new lines, but they have also had to judge how the full core curriculum will be assessed in this new format and how to therefore organise the papers to reflect likely examination topics. As a past Examiner I can testify to the difficulty in preparing questions that are sufficiently rigorous in their factual content, unambiguous in their interpretation and pertinent to the curriculum to be accepted for inclusion in the FRCR 2A exam. The authors have done an admirable job in drawing together a large number of

high-quality questions that satisfy these criteria.

I have no doubt that candidates sitting the 2A exam will find this book a vital tool in their preparation. It provides a unique collection of questions, which will help familiarise candidates with the new format and demonstrate how their knowledge will need to be applied to maximise their chance of success when attempting single best answer papers. The authors are well placed to use their up-to-date knowledge of the Fellowship exam to guide future exam hopefuls through the pitfalls of the new format, and this publication should find its way onto many radiologists' bookshelves in the near future.

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June 2009

Preface

This book has been written by a large number of current trainees in Clinical Radiology and has been coordinated through The Society of Radiologists in Training (SRT). The SRT is the only national organisation of Radiology Trainees in the UK and is run by an elected committee to promote radiology training and education. The SRT organises an annual meeting for trainees and hosts an active website: www.thesrt.org.uk

This book is of particular relevance to higher trainees within radiology who are working towards the Final FRCR examination of the Royal College of Radiologists in the UK. This examination is in the process of being revised and single best answer (SBA) type questions will be introduced in Part A for the first time at the Autumn 2009 sitting. This type of question is well established in other professional examinations, but there are currently no published texts of such questions in Clinical Radiology so this book will meet a real need and aid candidates in their preparation. Candidates for other professional exams in Radiology will also find the text useful and those from other specialties will be able to explore the radiological aspects of their syllabus in greater depth.

More than 20 contributing authors, who all have very recent memory of sitting the Part A component of the Final FRCR examination, have written over 1250 single best answer questions and explanations covering the whole breadth of Clinical Radiology. As in the actual examination, readers will find that important topics have deliberately been covered by more than one author in more than one style and we hope, in addition to the factual information presented, that this will illustrate our interpretation of the various ways in which this style of question may be phrased.

The questions are grouped by topic and split into three papers of 70 questions each. This is very similar to the Royal College format of 75 questions per paper. The explanations have been separated into separate chapters so that readers may either attempt a whole mock exam paper or browse through question by question. This book is intended as a bridge between a pure revision aid and a reference text and we include a bibliography of useful references for further information. There are also references to a small number of particularly relevant journal articles within the explanations.

We thank the many colleagues who have given their time and experience

PREFACE

in helping write the questions and thank Chuks Ihezue for his help with the genito-urinary questions. We wish every candidate success and would always be grateful for feedback, which can be submitted via the Society Website or email: president@thesrt.org.uk

Robin Proctor
June 2009

About the editor

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Robin read medicine at Churchill College, Cambridge where he won a college scholarship before completing his clinical studies at Balliol College, Oxford, winning the prize in Orthopaedic Surgery in the process. He subsequently completed MRCP before training as a General Practitioner and being awarded MRCGP with distinction. He then worked as a GP and Police Surgeon until returning to Hospital Medicine in 2005 as a Specialist Registrar in Radiology. He completed FRCR in 2008. He enjoys teaching medicine and has authored a number of books and articles including a randomised trial comparing teaching methods for medical students.

He has also worked as the expedition leader and medical officer on a diving expedition to the Philippines and in his spare time he enjoys the outdoors, teaches sub-aqua diving and particularly enjoys sailing on the west coast of Scotland.

He has been SRT President since 2007 and conceived this project to produce single best answer MCQs for the new Final FRCR Part A examination as part of a strategy to keep the SRT at the forefront of Radiology training.

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Abbreviations

ACE	angiotensin converting enzyme
AICA	anterior inferior cerebellar artery
AIDS	acquired immune deficiency syndrome
ACL	anterior cruciate ligament (of knee)
ADC	apparent diffusion coefficient map
ALP	alkaline phosphatase
AP	anteroposterior
ASD	atrial septal defect
AVM	arteriovenous malformation
AVSD	atrio-ventricular septal defect
AXR	plain abdominal radiograph
βHCG	beta human chorionic gonadotropin
bpm	beats per minute
BRCA	breast cancer, early onset (tumour suppressor gene)
CC	craniocaudal
CMV	<i>Cytomegalovirus</i>
CNS	central nervous system
CPAP	continuous positive airways pressure
CSF	cerebro-spinal fluid
CPR	cardiopulmonary resuscitation
CT	computed tomography
CVA	cerebrovascular accident
CVP	central venous pressure
CXR	chest radiograph
DaTSCAN	dopamine transporter scan
DCIS	ductal carcinoma <i>in situ</i>
DDH	developmental dysplasia of the hip
DMSA	tc-99m-dimercaptosuccinic acid
DTPA	tc-99m-diethylenetriamine pentaacetic acid
DVT	deep vein thrombosis
DWI	diffusion weighted imaging
ECA	external carotid artery
ECG	electrocardiogram

ENT	ear, nose and throat
ERCP	endoscopic retrograde cholangio pancreatography
ESR	erythrocyte sedimentation rate
FAST	focused abdominal sonography in trauma
FDG	fluorodeoxyglucose
FESS	functional endoscopic sinus surgery
FEV1	forced expiratory volume in 1 second
FLAIR	fluid attenuated inversion recovery
FNA	fine needle aspirate
FSH	follicle stimulating hormone
FVC	forced vital capacity
GBM	glioblastoma multiforme
GCS	Glasgow Coma Score
GFR	glomerular filtration rate
GOJ	gastro-oesophageal junction
GU	genito-urinary
HIDA	hepatobiliary iminodiacetic acid
HIV	human immunodeficiency virus
HMPAO	hexamethyl-propylene amine oxime
HRCT	high resolution computed tomography
HRT	hormone replacement therapy
HU	Hounsfield units
ICA	internal carotid artery
ICU	intensive care unit
ITU	intensive therapy unit
IUGR	intra-uterine growth retardation
IV	intravenous
IVC	inferior vena cava
IVP	intravenous pyelogram
IVU	intravenous urogram
KUB	X-ray of kidneys, ureters and bladder
LAD	left anterior descending (artery)
LCIS	lobular carcinoma <i>in situ</i>
LCL	lateral collateral ligament (of knee)
LDH	lactate dehydrogenase
LVH	left ventricular hypertrophy
LH	luteinising hormone
LOC	loss of consciousness
MAG3	tc-99m-mercaptoacetyl triglycine
MCA	middle cerebral artery
MCL	medial collateral ligament (of knee)
MCUG	micturating cystourethrogram
MCV	mean cell volume
MDP	tc-99m methylene-diphosphonate
MEN	multiple endocrine neoplasia

ABBREVIATIONS

MHA-TP	microhaemagglutination treponema pallidum test
MIBG	meta-iodobenzylguanidine
MLO	medio-lateral oblique
MRCP	magnetic resonance cholangiopancreatography
MRI	magnetic resonance imaging
MS	multiple sclerosis
MUGA	multi-gated acquisition scan
NAI	non-accidental injury
NF1	neurofibromatosis type 1
NF2	neurofibromatosis type 2
NG	nasogastric
OCP	oral contraceptive pill
OPG	orthopantomogram radiograph
PA	posteroanterior
PCOS	polycystic ovarian syndrome
PD	proton density
PDA	patent ductus arteriosus
PE	pulmonary embolus
PET	positron emission tomography
PICA	posterior inferior cerebellar artery
PID	pelvic inflammatory disease
PNET	primitive neuroectodermal tumour
PPH	post-partum haemorrhage
PSA	prostate specific antigen
PTH	parathyroid hormone
RI	resistance index
ROI	region of interest
RSV	respiratory syncytial virus
RTA	road traffic accident
SCA	superior cerebellar artery
SPECT	single photon emission computed tomography
STIR	short tau inversion recovery
SUV	standardised uptake value
SVC	superior vena cava
T1	T1-weighted MRI
T2	T2-weighted MRI
T2*	T2*-weighted MRI
TCC	transitional cell carcinoma
TNM	tumour, nodes and metastases cancer staging system
TSH	thyroid stimulating hormone
US	ultrasound
USS	ultrasound scan
VACTERL	syndrome of vertebral, anal, cardiac, tracheo-oesophageal fistula/ oesophageal atresia, renal and limb abnormalities
VDRL	Venereal Disease Research Laboratory test

VF	ventricular fibrillation
V/Q scan	ventilation/perfusion scan
VSD	ventricular septal defect
VUJ	vesicoureteric junction
WCC	white cell count



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Introduction

THE NEW FRCR 2A SYLLABUS

The Royal College of Radiologists (www.rcr.ac.uk) sets the FRCR examination and will provide guidance notes and a syllabus to prospective candidates on request. These comments are our current interpretation of what the college intends but candidates should check with the college that they remain applicable.

The Final FRCR Part A syllabus has been revised and some topics have been removed, notably physics and anatomy. These remain important to Clinical Radiology and will be tested elsewhere, but it does not make sense to specifically revise them for the Final FRCR Part A examination in which they are not included. It is likely that some applied knowledge will remain applicable when directly clinically relevant, but pure anatomy and pure physics are no longer scheduled to be included.

The vast majority of the questions will be clinical questions and this is reflected in the content of this book. Do not be misled by the name of the examination modules, particularly the shortened term usually used by candidates; for example, Module 4 is 'GU' or Module 6 'Neuro'. While there will of course be genito-urinary questions in the 'GU' exam there will also be questions on renal, adrenal and breast radiology. Similarly, within the 'Neuro' module there will be questions on the jaw, teeth, eye and ophthalmology conditions, ENT and spinal pathology. While Neuroradiology questions may be the largest single group it may be that they do not even make up a majority of the exam, hence reading the syllabus and targeting exam preparation to all the topics that may be included is important.

There is also a number of general conditions that could appear in any module such as lymphoma, leukaemia, TB, HIV, NAI, melanoma, unknown primary, etc. For instance, it may be that the vignette and stem are based in the core of that module but that the question probes how that condition may extend to involve another organ or system. Consequently, a good general knowledge of such conditions may be useful.

Finally, our interpretation of the syllabus is that questions on statistics could be included and we have incorporated a handful in this book. While they are unlikely to form a large component of the exam it is likely that they will be comparatively easy marks for those who have a basic grasp of medical statistics and we hope the topics we cover will recur in the real exam.

HOW TO APPROACH SINGLE BEST ANSWER QUESTIONS

While these questions may test similar knowledge, they are different from true/false multiple choice questions and require different skills to answer them.

In preparing both these comments and the remainder of the book in general we have studied the published advice from the Royal College regarding the planned change in format of the FRCR examination. We found McCoubrie and McKnight's article in *Clinical Radiology* an extremely useful summary of the process and would recommend it to all prospective candidates for the new FRCR 2A examination. (McCoubrie P, McKnight L. Single best answer MCQs: a new format for the FRCR Part 2a exam. *Clinical Radiology*. 2008; **63**(5): 506–10). For those who wish a more in-depth text we suggest the National Board of Medical Examiners (NBME) Item Writing Manual which is available for free download from www.nbme.org/PDF/ItemWriting_2003/2003IWGwhole.pdf While this is written for those setting questions (and NBME have been involved in the training of the regional panels who set questions for the RCR) this manual will give candidates a good background of the important issues regarding multiple choice questions of all types in the clinical setting.

Style of question

The new style question will require the candidate to read a 'vignette' – a sentence or paragraph setting the scene, which is likely to be a clinical scenario – and then to read and consider a question before picking the best answer from five possible options. These questions are widely established in other areas of clinical medicine, although they are relatively new to Radiology. They are better suited to testing more applied knowledge and compared to true/false questions it is hoped that performance will depend more on knowledge than technique. Previously, with true/false questions exam savvy candidates who may be stronger on technique than knowledge may have done much better than expected. Similarly, it will no longer be possible to associate individual words in the question and answer to work out the correct answer and it is likely that a greater command of written English will be required with single best answer questions than with the true/false style. It is also hoped that the knowledge tested will be more applied and there will be less scope for learning (or having to learn) 'just for the exam'.

The ideal question will test how to apply knowledge in a particular scenario and will require both the knowledge itself and the correct application of this knowledge to succeed rather than just the knowledge alone. The aim is for questions in the 'Who wants to be a Millionaire?' format which can almost always be answered by a good candidate before reading the possible options. (In medical education jargon, no cue is needed from the options.)

In the ideal question all the options should be 'homogeneous' or 'on the same continuum' hence while the correct option should clearly be identifiable (and should be very much more likely than the others) the other options may remain possible but much less likely and are unlikely to all be entirely wrong.

There are a number of options for how to construct good questions and after attempting a number of practice questions candidates will better appreciate

how the questions are constructed. Particularly in Clinical Radiology, there is likely to be an initial description giving some combination of the clinical history, pathological, radiological and examination findings. The question part may then ask about the diagnosis, differential treatment, radiological findings (if not already given or in a different modality) or associated features. For most questions the options are likely to be presented as a list but for some questions, for instance staging lung cancer, tabulating the options works well.

When writing these questions it is possible to put a number of twists in the question or to take the question several levels away from the answer and this application of knowledge can make a question more discriminatory.

Different formats

The intention is usually to examine important information rather than what is easy to test and we suspect that the majority of questions will do this in the SBA format. There are some topics, however, which are particularly difficult to access in the new format and it remains to be seen what the Royal College Examiners will choose to do. It may be that they do not include these topics or find a novel way of approaching the information in SBA format, but we think it more likely that some topics will be examined with questions of a different format and this is the route we have chosen to take in this book where we have opted to vary the format of the questions slightly for these few topics to include particularly important information that we feel is likely to be incorporated in the College examinations.

The ideal SBA question will not be phrased in the negative and use terms such as NOT, LEAST LIKELY or EXCEPT. For some of the topics that are difficult to examine it may be that these questions are used and we have included a few in this book for this reason.

It is also possible that some questions will be phrased, 'Regarding XYZ, which of the following is true?' This is essentially a true/false question where you know that only one of the options is true, hence if you can answer any four of the options, you can answer the question correctly as even if you only know those that are false you can deduce that the remaining option must be the correct answer.

It is much easier to convert old true/false questions into these formats than proper SBA and as the RCR has a large bank of true/false questions it may be that they choose to do this to make up the number of available questions.

Similarly, there are some topics that lend themselves so well to multiple choice questions that there is always a temptation to examine them because they are easy to test rather than because they are particularly important or useful. We have tried hard to target questions to the important or useful topics and have made efforts to avoid easily constructed but largely irrelevant items, but this too would be a relatively easy way to make up the number of available questions.

No more negative marking: answer every question

You may pass with knowledge alone and the bulk of this book is dedicated to helping you do this. Some candidates, however, – whether through poor preparation, nerves, bad luck or whatever other cause – will find themselves close to passing but stumped by a number of questions and teetering close to but below the pass mark. At this point exam technique really comes into its own and it is a question of ‘salvage’ – getting whatever you can from the remaining questions and on balance doing better than chance. You don’t need to be correct in every guess, just to skew the odds in your favour so you are more likely to be correct than with a blind guess and with each question you will continue to pull closer to the pass mark and ahead of the pack. Now that negative marking has been scrapped there is no risk of failing through bad luck from poor guessing and everyone should aim to maximise their mark even with the questions they don’t understand or of which they are uncertain. Unlike with negative marking there is no longer a need to get more right than wrong and it is now quite simple – answer every question.

HOW TO GET A QUESTION RIGHT WHEN YOU DON’T KNOW THE ANSWER

You may be able to narrow the options down through your knowledge of what is being tested alone and pick between them, but even if you know nothing about the topic then you should guess intelligently.

The following methods of exam technique are likely to get you more than the expected 20% on a one from five single best answer question. These questions are difficult to construct properly and you should exploit any weakness in the question for your gain. What an examiner may consider a fault may prove helpful to a candidate with good technique and act as a marker for the right answer, even if you know nothing about the topic being examined. The following tips are presented roughly in descending order of reliability and several may be applicable to a single question.

- 1 Be suspicious of answers that do not follow from the stem (grammatically or temporally) as they are unlikely to be correct and are probably poor distractors.
- 2 If there are multiple stems that would have to be correct if one stem was correct, that stem must be wrong; that is, if option A were correct then option B would also have to be correct means that A must be wrong as there can only be one correct answer. (It remains possible that B is the correct answer unless B being correct would also imply that A had to be correct too.) See example below.
- 3 Compare the options and use the vignette for clues to the answer – is there a key difference between them (e.g. histiocytosis and LAM) that you remember which you can work backwards to deduce from the vignette?

- 4 Look for ‘non-homogeneous’ (to use medical education jargon) options where one answer is substantially different from the others. This item is probably an incorrect ‘filler’. (Beware that it is possible but less likely that it is the correct answer and limited knowledge may help you spot this if the other four options are poor ‘fillers’.)
- 5 You may be able to use one question to work out the answer from another; for example, a vignette may give a clinical history and a radiological finding and then later in the paper a question may ask what finding you would expect in that clinical situation.
- 6 Look for a cue in the options – longer options with more detail are more likely in a correct answer.
- 7 Terms that are repeated in question and option make that option more likely to be the correct answer.
- 8 Normal values or a ‘null’ option are probably wrong.
- 9 Convergence: Look for options where some component overlaps; the option with the most overlap with all the other options is more likely correct. This is particularly obvious with a table where the most frequently occurring option in a column is probably correct and by considering all the columns together it may be possible to narrow down the options to a single answer. (Note, however, that when setting the questions in this book we have deliberately drawn up tables where this is not possible, but it is an extra step to use as a possible hint and it may be that some questions creep through without this check happening.)

Option	T Stage	N Stage	M Stage
A	1	2	X
B (More likely)	2	2	0
C	3	2	1
D	1	3	0
E	2	3	0
	T1 or T2 appear twice	N2 appears 3 times	M0 appears 3 times

- 10 When considering tabulated data think which is the more likely clinical scenario; for example, T2N2M0 is probably more clinically likely than T1N3M0.
- 11 Beware of absolute terms – medicine has never been an exact science. Such terms – always, invariably, never, etc. – may well be part of a distractor that the examiner has phrased in this way to make it wrong. It is good practice to think specifically if you know about that option in the condition being tested

and whether it is a specific clue as occasionally these terms will be correct but this is often obvious and is the exception rather than the rule.

- 12 If you have no idea, there may even be a clue in the order of the answers. When setting the options it is tempting to put the correct option slightly more often first or last and slightly less often at B or D. Clearly, there are easy rigorous ways to overcome this (alphabetical arrangement of the answers, which will be apparent when you look at the paper or use of truly random allocation, which won't).
- 13 Similarly, the extremes of numerical data are probably more likely to be incorrect.

For an illustration of these features, which have been exaggerated for effect, consider the following question:

A retired dockworker presents with shortness of breath and is assessed with a chest radiograph. This shows multiple leaf-shaped calcific opacities projected over both lungs. The underlying lungs appear normal. What is the most likely diagnosis?

- a Probably asbestos-related pleural plaques but not asbestosis
- b Asbestosis
- c Mania
- d Disseminated malignancy
- e Metastatic lung cancer

This question has a number of faults. Not only is the correct option (A) obvious but it is longer and more complete than the other options, making it distinctive. The correct option and the incorrect asbestosis are relatively similar compared to the other options, giving a hint that one of them is probably correct. The two options disseminated malignancy and lung cancer are mutually exclusive hence neither can be correct. The final distractor (mania) is entirely non-homogeneous, as the condition bears no relation to the patient's symptom and could not be diagnosed from the investigation in the question.

EXAM TECHNIQUE

Timekeeping

Single best answer questions take some time to read and time is likely to be much tighter than with the true/false format, particularly if you are not very quick at reading written English. Work out how long you have on average per question and at least on the first pass through the paper don't spend much longer than this on any one question. This method will maximise your chances of finishing the paper (and gaining any easy marks towards the end of the question paper) before you return to spend whatever time you have left on the difficult questions. Only spend the extra time on these questions as you go through if you are certain that you will, overall, still have time to complete the paper. Many people like to

take a clock and write down the time the exam started and will finish.

We chose 70 questions as the length of the papers in this book to achieve a balance between content and the time required to complete the paper before the Royal College of Radiologists confirmed their plans for the examination. They have very recently announced their intention to include 75 questions in the actual examination and we highlight this so candidates are aware that in the actual exam five more questions will need to be completed in the available time than in the papers in this book.

Order in which to answer questions

There is no obligation to answer the questions in the order in which they are presented and candidates adopt many strategies including missing out those they are unsure of and completing those of which they are certain before returning to the others. Indeed, the vast majority of candidates will miss out at least a few questions on their first pass. When doing this make sure of two things. Firstly, make sure that you make a note somewhere of which question you need to return to. You could have a blank sheet with headings such as 'Need to check' (but reasonably sure), 'It'll come back to me' and 'No idea'. Other people prefer to write on the question paper and circle the question number, draw an arrow in from the margin, or whatever. Similarly, a few will write a similar description for questions where they are so certain that they don't want to go back and waste time checking to remind them to miss out that question if they are checking the paper at the end. Secondly, and most importantly, when you miss out a question make absolutely certain that you put the answer to the next question you answer in the correct place on the answer sheet.

Writing the answers on the question paper or a blank sheet

Some candidates initially note their answers on the question paper or a blank sheet and then transfer them to the answer sheet after they have answered all the questions. This method may appeal to some people particularly if they are apt to change their minds several times and are worried they may 'make a mess' of the exam answer paper, but it is extremely high risk for two reasons. Firstly, errors when under pressure are easy and getting out of sequence with the answers will be catastrophic. Secondly, if you run out of time then rather than having, say, 99% of the paper complete you will have nothing as your answers cannot be handed in until they are transcribed. Hence we would sound a note of caution and advise that if you do choose this method, you should be exceptionally careful to keep the right question with the right answer and to complete the transcription in good time.

If you run out of time

If you run out of time, rapidly fill in any blanks and the remainder of the questions by just guessing the answer. If you really have run out of time it is critically important you mark any answer for every question as quickly as possible so do not waste time reading the question paper – just guess randomly.



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Genito-urinary, adrenal, obstetric, gynaecological and breast radiology

PAPER 1

- 1 A 50-year-old male patient undergoes a CT examination following the administration of intravenous and oral contrast medium in the portal venous phase for investigation of persistent abdominal pain. His left adrenal gland is noted to have a 'bulky' anterior limb width measuring 2 cm with Hounsfield units of 18. What is the most likely diagnosis?
 - a Adrenal haemorrhage
 - b Adrenal *tuberculosis*
 - c Adrenal adenoma
 - d Adrenocortical carcinoma
 - e Adrenal myelolipoma
- 2 A 45-year-old man with a spiculated mass on his chest radiograph undergoes staging CT examination following the administration of intravenous contrast medium for a possible bronchial carcinoma. There is an enlarged right adrenal mass of 2 cm found with an average density of 40 HU. What is the appropriate next investigation for characterisation of the adrenal mass?
 - a PET
 - b Unenhanced and delayed phase CT examination
 - c MRI
 - d MIBG
 - e Follow-up staging CT examination in three months

- 3** A female neonate with a family history of an autosomal recessive lipoidosis is found to have hepatomegaly and splenomegaly on clinical examination. Punctate cortical adrenal calcification is visible on her abdominal X-ray. What is the most likely diagnosis?
- a** Neuroblastoma
 - b** Ganglioneuroma
 - c** Pheochromocytoma
 - d** Wolman's disease
 - e** Benign cystic disease
- 4** A 65-year-old female patient with a history of hypertension presents with acute right flank pain and shock. A CT demonstrates a right-sided adrenal mass, which is of predominately low attenuation (several areas measure -100 HU) and associated retroperitoneal haemorrhage. What is the most likely diagnosis?
- a** Myelolipoma
 - b** Pheochromocytoma
 - c** Adenoma
 - d** Adrenal artery aneurysm
 - e** Adrenocortical carcinoma
- 5** A 38-year-old man undergoes investigation for persistent hypertension. He is found to have an increased aldosterone and decreased renin level. What investigation is most likely to help establish the diagnosis?
- a** CT examination with adrenal protocol (unenanced and delayed phases)
 - b** MRI examination with fat suppression sequences
 - c** MIBG
 - d** Ultrasound
 - e** Adrenal venous sampling
- 6** A 50-year-old female presents with sweating, palpitations and uncontrollable hypertension. As part of her work-up a MIBG (metaiodobenzylguanidine) nuclear medicine scan is performed. How will this advance her management?
- a** Distinguish pheochromocytoma from carcinoid
 - b** Locate an extra-adrenal pheochromocytoma
 - c** Distinguish between Cushing's disease and Cushing's syndrome
 - d** Exclude papillary thyroid carcinoma
 - e** Exclude Addison's syndrome
- 7** A 55-year-old man with acute necrotising pancreatitis was assessed with CT after being cared for on the ITU for six days. An unenhanced examination was performed due to renal impairment, which demonstrated bilateral adrenal enlargement with an attenuation of 75 HU. What is the most likely cause for this?

- a Adrenal adenomas
 - b Adrenocortical carcinoma
 - c Metastatic deposits
 - d Adrenal haemorrhage
 - e Adrenocortical hyperplasia
- 8 A newspaper article reports that using HRT may double the risk of breast cancer. Assuming that the report refers to the relative risk attributable to HRT and that the underlying risk in the population studied is 1.5 per 100 women over five years then what is the absolute increase in risk? (Options are per 100 women over five years.)
- a 0.003
 - b 0.03
 - c 0.15
 - d 0.3
 - e 1.5
- 9 A 40-year-old woman presents with a breast lump felt over the past four weeks. On examination, there is a firm, discrete, mobile mass palpable in the right upper outer quadrant. Mammography demonstrates a 1-cm well-circumscribed round soft-tissue density in the upper outer quadrant of the right breast. What is the most appropriate management of this patient?
- a Reassure that the lesion is benign in nature and discharge to primary care
 - b Perform ultrasound to confirm benign appearance, provide reassurance and discharge to primary care
 - c Perform ultrasound and ultrasound-guided core needle biopsy if a solid lesion is visible
 - d Perform stereotactic-guided core needle biopsy
 - e Discuss at MDT meeting with a view to proceeding to wide local excision
- 10 A 40-year-old woman presents with a palpable breast lump for several weeks. On examination, a firm, relatively mobile mass is palpable in the left upper outer quadrant. Mammograms demonstrate a well-circumscribed round soft-tissue density in the upper outer quadrant of the left breast. What feature on ultrasound would favour a diagnosis of a breast cyst above that of fibroadenoma?
- a Multiple bilateral lesions of similar appearance
 - b Internal calcification
 - c A round hypoechoic lesion with a smooth well-defined margin
 - d A hypoechoic lesion with internal echoes homogeneously distributed within the lesion
 - e A hyperechoic posterior wall

- 11** A 40-year-old obese woman is found to have a painless mass in the right breast by her general practitioner during a routine medical examination. What feature would favour a diagnosis of an oil cyst over that of a lipoma?
- a** A history of recent lactation
 - b** A rounded lucent lesion on mammography
 - c** A surrounding capsule seen on mammography
 - d** Demonstration of eggshell calcification
 - e** Multiple areas of fatty and fibroglandular density
- 12** A 70-year-old woman presents with invasive ductal carcinoma. Where in her breast is it most likely to be located?
- a** Retroareolar
 - b** Upper inner quadrant
 - c** Upper outer quadrant
 - d** Lower inner quadrant
 - e** Lower outer quadrant
- 13** A 50-year-old woman presented with fatigue and her physician was concerned she had metastatic disease of unknown origin. Her diagnostic work-up included a mammogram which demonstrated a suspicious lesion in the left upper outer quadrant. A biopsy confirmed this to be a breast carcinoma. Where is the most likely place for this lesion initially to have metastasised?
- a** Brain
 - b** Liver
 - c** Bone
 - d** Lung and pleurae
 - e** Lymph nodes other than ipsilateral axillary nodes
- 14** A 62-year-old woman is treated for invasive ductal carcinoma with a wide local excision and axillary clearance. Which of the following is the most appropriate follow-up mammography regime?
- a** Every six months until the age of 70 and then self-referral at patient's request
 - b** Every six months for the first year and annually thereafter
 - c** Every six months for the first two years and annually thereafter
 - d** Every year until the age of 70 and then self-referral at patient's request
 - e** Every year for five years then return to the breast-screening programme

- 15** A 51-year-old woman presents to the breast clinic with a palpable lump felt in the lateral aspect of the right breast, which had increased in size since she went through the menopause. It measures 4.5 cm and shows posterior acoustic shadowing on USS. On mammography the margins are partly well-circumscribed and partly obscured. Peripheral egg shell calcification is visible. Her menarche was at 12; she had three pregnancies and has never taken HRT or the OCP. Which of the feature makes a diagnosis other than a breast cyst more likely?
- a** Margins which are partly well-circumscribed and partly obscured
 - b** Size greater than 4 cm
 - c** An increase in size in the post-menopausal period, in the absence of HRT
 - d** Peripheral eggshell calcification
 - e** Posterior acoustic shadowing
- 16** A 40-year-old woman with a family history of breast cancer presents with a palpable breast lump. Histology confirms a diagnosis of invasive breast carcinoma. What is the most likely pathological type?
- a** Ductal carcinoma
 - b** Lobular carcinoma
 - c** Medullary
 - d** Sarcomatous carcinoma
 - e** Mucinous (colloid) carcinoma
- 17** A 56-year-old woman attended for routine mammographic screening. Calcification was noted on her mammograms and after further work-up she was diagnosed as having invasive carcinoma in the area of the calcifications. What is the most likely morphology of the calcifications?
- a** Spherical with a radiolucent centre
 - b** Popcorn
 - c** Rounded
 - d** Linear, branching
 - e** Rod shaped (thick, linear)

- 18** A 51-year-old woman with a family history of breast cancer underwent a screening mammogram, which demonstrated an abnormal area of multiple microcalcifications. No other abnormality was visible and this was not seen on an ultrasound. A stereotactic-guided excision was performed which showed invasive carcinoma. How large is it most likely the calcifications were?
- a** <0.5 mm
 - b** 0.5–1.5 mm
 - c** 1.5–3 mm
 - d** 3–5 mm
 - e** >5 mm
- 19** A 65-year-old woman, who was known to have a primary malignancy elsewhere, had a mammogram which showed multiple well-defined soft-tissue opacities. These were proven to be metastases from her primary. What primary is she most likely to have?
- a** Lymphoma, oesophageal carcinoma, lung carcinoma, renal cell carcinoma
 - b** Lung carcinoma, oesophageal carcinoma, renal cell carcinoma, melanoma
 - c** Lymphoma, cervical carcinoma, colorectal carcinoma, gastric carcinoma
 - d** Lymphoma, melanoma, ovarian carcinoma, lung carcinoma
 - e** Oesophageal carcinoma, cervical carcinoma, ovarian carcinoma, lung carcinoma