An Aid to the MRCP PACES

Fourth Edition

R.E.J. Ryder, M.A. Mir, E.A. Freeman and E.N. Fogden

WILEY-BLACKWELL
'MRCP; Member of the Royal College of Physicians. . . They only give that to crowned heads of Europe'.

From The Citadel by A.J. Cronin

Dear Reader of An Aid to the MRCP PACES,

Please help us with the next edition of these books by filling in the survey on our website for every sitting of PACES that you attend. It does not matter if you pass or fail or pass well or fail badly. We need information from all these situations. These books are only as they are because of candidates in the past who filled in the surveys. Please do your bit for the candidates of the future. The website where you can fill in the survey is www.ryder-mrcp.org.uk

Good luck on the day.

Best wishes,
Bob Ryder
Afzal Mir
Anne Freeman
Edward Fogden
One-quarter of the royalties from this book will be donated to the Missionaries of Charity of Mother Teresa of Calcutta.


Wiley-Blackwell is an imprint of John Wiley & Sons, formed by the merger of Wiley’s global Scientific, Technical and Medical business with Blackwell Publishing.

Registered office: John Wiley & Sons, Ltd, The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, UK

Editorial offices: 9600 Garsington Road, Oxford, OX4 2DQ, UK
The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, UK
111 River Street, Hoboken, NJ 07030-5774, USA

For details of our global editorial offices, for customer services and for information about how to apply for permission to reuse the copyright material in this book please see our website at www.wiley.com/wiley-blackwell.

The right of the author to be identified as the author of this work has been asserted in accordance with the UK Copyright, Designs and Patents Act 1988.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, except as permitted by the UK Copyright, Designs and Patents Act 1988, without the prior permission of the publisher.

Designations used by companies to distinguish their products are often claimed as trademarks. All brand names and product names used in this book are trade names, service marks, trademarks or registered trademarks of their respective owners. The publisher is not associated with any product or vendor mentioned in this book. This publication is designed to provide accurate and authoritative information in regard to the subject matter covered. It is sold on the understanding that the publisher is not engaged in rendering professional services. If professional advice or other expert assistance is required, the services of a competent professional should be sought.

The contents of this work are intended to further general scientific research, understanding, and discussion only and are not intended and should not be relied upon as recommending or promoting a specific method, diagnosis, or treatment by physicians for any particular patient. The publisher and the author make no representations or warranties with respect to the accuracy or completeness of the contents of this work and specifically disclaim all warranties, including without limitation any implied warranties of fitness for a particular purpose. In view of ongoing research, equipment modifications, changes in governmental regulations, and the constant flow of information relating to the use of medicines, equipment, and devices, the reader is urged to review and evaluate the information provided in the package insert or instructions for each medicine, equipment, or device for, among other things, any changes in the instructions or indication of usage and for added warnings and precautions. Readers should consult with a specialist where appropriate. The fact that an organization or website is referred to in this work as a citation and/or a potential source of further information does not mean that the author or the publisher endorses the information the organization or website may provide or recommendations it may make. Further, readers should be aware that internet websites listed in this work may have changed or disappeared between when this work was written and when it is read. No warranty may be created or extended by any promotional statements for this work. Neither the publisher nor the author shall be liable for any damages arising herefrom.

Library of Congress cataloging-in-publication data
An aid to the MRCP PACES. – 4th ed. p. ; cm. Aid to the Membership of the Royal College of Physicians Practical Assessment of Clinical Examination Skills includes bibliographical references and index. Summary: "The first volume in this revised suite of the best-selling MRCP PACES revision guides is now fully updated. It reflects both feedback from PACES candidates as to which cases frequently appear in each station. Also taken into account is the new marking system introduced in which the former four-point marking scale has been changed to a three-point scale and candidates are now marked explicitly on between four and seven separate clinical skills"–Provided by publisher. ISBN 978-0-470-65509-2 (v. 1 : pbk. : alk. paper) – ISBN 978-0-470-65518-4 (v. 2 : pbk. : alk. paper) – ISBN 978-1-118-34805-5 (v. 3 : pbk. : alk. paper) I. Wiley-Blackwell (Firm) II. Title: Aid to the Membership of the Royal College of Physicians Practical Assessment of Clinical Examination Skills. [DNLM: 1. Physical Examination–Great Britain–Examination Questions. 2. Ethics, Clinical–Great Britain–Examination Quest

A catalogue record for this book is available from the British Library.

Wiley also publishes its books in a variety of electronic formats. Some content that appears in print may not be available in electronic books.

Cover image: © Wiley-Blackwell
Cover design by Sarah Dickinson

Set in 8.75/11.5 pt Minion by Toppan Best-set Premedia Limited

1 2013
## Contents

Preface, ix  
Introduction, xiii  

### Section G: Examination Routines, 1

1. Pulse, 7  
2. Heart, 8  
3. Chest, 13  
4. Abdomen, 17  
5. Visual fields, 22  
6. Cranial nerves, 23  
7. Legs, 30  
8. Legs and arms, 34  
9. Gait, 35  
10. Ask some questions, 36  
11. Fundi, 39  
12. Eyes, 43  
13. Face, 45  
14. Hands, 47  
15. Skin, 51  
16. Rash, 53  
17. Neck, 54  
18. Thyroid status, 56  
19. Knee, 58  
20. Hip, 60  
21. What is the diagnosis? 61

### Section H: Integrated Clinical Assessment, 65

Station 5, Scenarios by specialty, 75

#### Dermatology

1. Non-resolving leg ulcer: pyoderma gangrenosum, 77  
2. Generalized rash: psoriasis, 81  
3. Dermatomyositis and falls, 85

#### Rheumatology

4. Systemic sclerosis and Raynaud’s syndrome, 90  
5. Rheumatoid arthritis and effects on activities of daily living (ADL), 94  
6. Psoriatic arthropathy, 98  
7. Ankylosing spondylitis: short notes, 101  
8. Gout: short notes, 102  
9. Steroid toxicity: short notes, 103  

### Endocrine

10. Thyroid eye disease, 105  
11. Acromegaly, 109  
12. Diabetes mellitus and Charcot joint, 112  
13. Diabetes mellitus: foot ulcer and diabetes control, 116  
14. Goitre and weight loss, 119

### Eyes

15. Retinitis pigmentosa, 125  
16. Optic atrophy, 128  
17. Visual blurring in a patient with diabetes mellitus, 132

### Gastroenterology

18. Iron deficiency anaemia, 137  
19. Haematemesis, 141  
20. Elevated liver function tests: non-alcoholic fatty liver disease (NAFLD), 146  
21. Elevated liver function tests and hepatitis B serology, 151  
22. Crohn’s disease/inflammatory bowel disease, 155  
23. Dysphagia and weight loss, 158  
24. Diarrhoea: recent antibiotics, 162  
25. Weight loss, 166  
26. Gastrointestinal bleed: significant bleed, 169

### Haematology

27. Anaemia, 173  
28. Easy bruising/idiopathic thrombocytopenic purpura, 176  
29. Epistaxis/elevated international normalized ratio (INR), 180  
30. Neutropenic sepsis, 184

### Cardiology

31. Young syncope, 188  
32. Angina/chest pain, 193  
33. Palpitations atrial fibrillation, 197  
34. Breathlessness/congestive cardiac failure, 201  
35. Syncope/aortic stenosis, 205  
36. Syncope (orthostatic), 208

### Respiratory

37. Chronic obstructive pulmonary disease (COPD), 211
38 Asthma, 214
39 Pleural effusion, 217
40 Short of breath ?pulmonary embolism, 221
41 Rheumatoid arthritis/breathlessness, 226
42 Haemoptysis, 229

Neurology
43 Headache: progressive/memory issues, 233
44 Headache: migraine, 236
45 Subarachnoid haemorrhage, 240
46 Transient ischaemic attack: loss of vision, 243
47 Left-sided weakness in a young woman, 247
48 Parkinson’s disease/falls in an elderly woman, 250
49 Cranial nerve VI palsy: sudden onset, 254
50 Blackout: first fit, 258
51 Essential tremor, 263
52 Temporal arteritis, 267
53 Carpal tunnel syndrome, 270
54 Multiple sclerosis/diplopia, 274
55 Peripheral neuropathy, 279

Miscellaneous cases
56 Urinary tract infection: male/sexual history, 283
57 Swollen calf in a young woman, 287
58 Deep venous thrombosis (DVT) secondary to neoplasia: elderly patient, 291
59 Deterioration in renal function, 295
60 Fever in the returning traveller, 299

Section I: Short Case Records, 305
Station 5, Skin, 309
1 Systemic sclerosis/CREST syndrome, 311
2 Neurofibromatosis (von Recklinghausen’s disease), 312
3 Osler–Weber–Rendu syndrome, 314
4 Psoriasis, 316
5 Rash of uncertain cause, 318
6 Dermatomyositis, 319
7 Xanthomata, 321
8 Vitiligo, 324
9 Adenoma sebaceum in tuberous sclerosis complex, 328
10 Pseudoxanthoma elasticum, 330
11 Lichen planus, 333
12 Yellow nail syndrome, 335
13 Gouty tophi, 336
14 Alopecia areata, 337
15 Eczema, 339
16 Pretibial myxoedema, 342
17 Clubbing, 343
18 Necrobiosis lipoidica diabetorum, 345
19 Lupus pernio, 347
20 Tinea, 350
21 Koilonychia, 352
22 Raynaud’s phenomenon, 353
23 Erythema nodosum, 355
24 Sturge–Weber syndrome, 358
25 Purpura, 360
26 Peutz–Jeghers syndrome, 363
27 Vasculitis, 364
28 Ehlers–Danlos syndrome, 366
29 Livedo reticularis, 368
30 Pemphigus/pemphigoid, 370
31 Radiation burn on the chest, 373
32 Herpes zoster, 374
33 Henoch–Schönlein purpura, 376
34 Mycosis fungoides, 378
35 Morphoea, 380
36 Kaposi’s sarcoma (AIDS), 382
37 Porphyria, 385
38 Lupus vulgaris, 387
39 Dermatitis herpetiformis, 389
40 Urticaria pigmentosa (mastocytosis), 391
41 Palmoplantar keratoderma (tylosis), 393
42 Secondary syphilis, 395
43 Ectodermal dysplasia, 397
44 Partial lipodystrophy, 399
45 Fabry’s disease, 401
46 Reiter’s syndrome/reactive arthritis/keratoderma blennorrhagica, 403
47 Malignant melanoma, 405
48 Acanthosis nigricans, 407
49 Keratoacanthoma, 410
50 Pyoderma gangrenosum, 411
51 Psychogenic/factitious, 413

Station 5, Locomotor, 415
1 Rheumatoid arthritis, 416
2 Psoriatic arthropathy, 422
3 Systemic sclerosis/CREST syndrome, 425
4 Diabetic foot/Charcot’s joint, 428
5 Tophaceous gout, 431
6 Ankylosing spondylitis, 433
7 Paget’s disease, 435
8 Osteoarthritis, 437
9 Marfan’s syndrome, 439
10 Vasculitis, 441
11 Proximal myopathy, 442
12 One leg shorter and smaller than the other, 443
13 Radial nerve palsy, 444
14 Arthropathy associated with inflammatory bowel disease, 445
15 Polymyositis, 447
16 Systemic lupus erythematosus, 448
17 Old rickets, 450
18 Juvenile idiopathic arthritis, 452
19 Swollen knee, 454

Station 5, Endocrine, 457
1 Exophthalmos, 458
2 Acromegaly, 461
3 Graves’ disease, 464
4 Goitre, 467
5 Hypothyroidism, 470
6 Cushing’s syndrome, 473
7 Addison’s disease, 478
8 Hypopituitarism, 481
9 Pretibial myxoedema, 483
10 Gynaecomastia, 485
11 Turner’s syndrome, 488
12 Klinefelter’s syndrome/hypogonadism, 490
13 Bitemporal hemianopia, 494
14 Diabetic foot/Charcot’s joint, 495
15 Necrobiosis lipoidica diabetorum, 496
16 Short stature, 497
17 Pseudohypoparathyroidism, 499
18 Pendred’s syndrome, 502

Station 5, Eyes, 505
1 Diabetic retinopathy, 506
2 Retinitis pigmentosa, 511
3 Optic atrophy, 512
4 Ocular palsy, 514
5 Visual field defect, 515
6 Retinal vein occlusion, 516
7 Old choroiditis, 518
8 Papilloedema, 520
9 Cataracts, 522
10 Myasthenia gravis, 524
11 Albinism, 525
12 Exophthalmos, 526
13 Myelinated nerve fibres, 527
14 Hypertensive retinopathy, 528
15 Glaucoma/peripheral field loss, 530
16 Retinal artery occlusion, 532
17 Asteroid hyalosis, 533
18 Drusen, 534
19 Laurence–Moon–Bardet–Biedl syndrome, 535
20 Cytomegalovirus choroidoretinitis (AIDS), 537
21 Normal fundus, 540

Station 5, Other, 541
1 Bilateral parotid enlargement/Mikulicz’s syndrome, 542
2 Deep venous thrombosis (DVT)/Baker’s cyst/cellulitis, 543
3 Peripheral vascular disease, 546
4 Osteogenesis imperfecta, 548
5 Down’s syndrome, 549
6 Pernicious anaemia, 550
7 Klippel–Feil syndrome, 552
8 Leg oedema, 554

Appendices, 557
1 Checklists, 559
2 Examination frequency of MRCP PACES short cases, 563
3 Texidor’s twinge and related matters, 567
4 Abbreviations, 569

Index, 572
A short history of An Aid to the MRCP PACES

‘Remember when you were young, you shone like the sun . . .’†

At the beginning of the 1980s, Bob Ryder, an SHO working in South Wales, failed the MRCP short cases three times (an SHO in modern parlance is a core medical trainee [CMT]).‡ On each occasion I passed the long case and the viva which constituted the other parts of the MRCP clinical exam in those days but each time failed the short cases. Colleagues from the year below who had been house physicians, with me the SHO, came through and passed while I was left humiliated and without this essential qualification for progression in hospital medicine.

The battle to overcome this obstacle became a two or more year epic that took over my life. I transformed from green and inexperienced¶ to complete expert in everything to do with the MRCP short cases as viewed from the point of view of the candidate. I experienced every manifestation of disaster (and eventually triumph) recorded by others in Volume 2, Section F. By the time of the third attempt, I was so knowledgeable that I was out of tune with the examiner on a neurology case simply because I was thinking so widely on the case concerned.∥ I believed at the time that I came close to passing at that attempt, although one never really knows and it was, after all, the occasion where I failed to feel for a collapsing pulse!** This was an important moment in the story because it was from this failure, along with the experience in the neurology case in my second attempt¶, that the examination routines and checklists, which are so central to this book, emerged. At the time there was a free, monthly journal that we all received called Hospital Update and it had a regular feature dedicated to helping candidates with the MRCP. In one issue the writer listed 70 cases which he reckoned were the likely short cases to appear in the exam and an eye-balling of this suggested it was fairly comprehensive.

And so I studied each of these 70 cases in the textbooks and made notes which were distilled into their classic features and other things that seemed important to remember and I wrote out an index card for each of the 70. Thus, the original drafts of the main short case records were penned whilst I was still sitting the MRCP.

Another major contributor to my final success with the exam was junior doctor colleague Anne Freeman. She had been on the Whipps Cross MRCP course with me prior to our first sittings of the exam and she passed where I had failed. Until that point, I think we would have considered ourselves equals in knowledge, ability and likelihood of passing.‡§ I would describe Anne as being like Hermione Granger.§§ In her highly
organized manner, she had written down the likely instructions that might be given in the short cases exam and under each had recorded exactly what she would do and in what order, should she get that instruction. She then practised over and over again on her spouse (Dr Peter Williams, to whom she is especially grateful) until she could do it perfectly, without thought or mistake or missing something out, even in the stress of the exam. I, on the other hand, was not like Hermione Granger. I could examine a whole patient perfectly in ordinary clinical life but had not actually thought through exactly what I would do, and in what order, when confronted with an instruction such as ‘examine this patient’s legs’ until it actually occurred in the exam. And so eventually I did what Anne Freeman had done and the first versions of the checklists (for which I am especially grateful to my wife, Anne Ryder, who wrote them out tidily and then ticked off each point as I practised the examining, pointing out whenever I missed something out!) and primitive versions of the examination routines were born, again whilst I was still sitting the MRCP.

Having finally passed the exam, it seemed a shame to waste all the insights into the exam and the experience I had gained, and all the work creating the 70 short case index cards and the examination routine checklists I had created and practised and honed so laboriously – and so I conceived the idea of putting them in a book for others to have the benefit without having to do so much of the work or, perhaps, to go through the ordeal of failing through poor preparation as I had done. I shortlisted what seemed to be the four major publishers of the moment and on a day in 1982 was sitting in the library of the University Hospital of Wales penning a draft letter to them. At a certain moment I got stuck over something – I have long since forgotten what – and on an impulse went down to Afzal Mir’s office to ask him something to do with whatever it was I was stuck over. It was a defining moment in the history of these volumes. When I left Afzal Mir’s office, the project had changed irrevocably. I was a registrar, he was a consultant. He was extremely interested in the subject himself and my consultation with him ended up with the project being one with both of us involved and me with a list of instructions (consultant to registrar!) as to what to do next!

And so an extremely forceful and creative relationship began, which led to An Aid to the MRCP Short Cases. It was not that we worked as a peaceful collaborative team – rather the thing came into existence through creativity on a battleground occupied by two equally creative and forceful (in very different ways) people with very different talents and approaches. There are famous examples of this type of creative force, e.g. Lennon and McCartney or Waters and Gilmour. Looking back, there is no doubt that without the involvement of myself and Afzal working together, an entirely different and inferior book would have emerged (probably the short 100-page pocket book desired by Churchill Livingstone – see below) but at the time I did not realize this and only thought that I was losing control of my project through the consultant–registrar hierarchy! My response was to bring in Anne Freeman, who I am sure would be very happy to be thought of as the Harrison/Starr or the Wright/Mason of the band!

Anne and I, in fact, also became a highly creative force through the development of the idea of surveying successful MRCP candidates to find out exactly what happened in the exam. It started off with me interviewing colleagues and this led to the development of a questionnaire to find out what instruction they had been given, what their findings were, what they thought the diagnosis was and their confidence in this, what supplementary questions they were asked, and their comments on the experience of that sitting. I distributed it to everyone I could find in my own and neighbouring hospitals, whilst Anne took on, with tremendous response, the immense task of tracking down every successful candidate at one MRCP sitting and getting a questionnaire to them! We asked all to report on both their pass and previous fail experiences.

Our overture to the publishers resulted in offers to publish from Churchill Livingstone (now owned by Elsevier Ltd) and Blackwell Scientific Publications (now owned by John Wiley & Sons) with the former coming in first and so we signed up with them. They were thinking of a 100-page small pocket book (70 brief short cases, a few examination routines, hardly any illustrations) sold at a price that would mean the purchaser would buy without thinking. The actual book, however, created itself once we got down to it and its size could not be controlled by our initial thoughts or the publisher’s aspirations. We based the book on the, by now, extensive surveys of candidates who had sat the exam and told us exactly what happened in it – the length and the breadth. This information turned the list of 70 cases into 150 and from the surveys also emerged the 20 examination routines required to cover most of the short cases which occurred. As to what should be included with each short case, that was determined by ensuring that we gave everything that the candidate might need to know according to what they told us in
the surveys. We were determined to cover everything that the surveys dictated might occur or be asked. It was also clear that pictures would help. We battled obsessively over every word and checked and polished it until it was as near perfect as possible. By the time it was finished three years later, the 100-page pocket book had turned into a monster manuscript full of pictures.

I took it to Churchill Livingstone who demanded that it be shrunk down to the size in the original agreement or at least some sort of compromise size. We were absolutely certain that what we had created was what the MRCP short case-sitting candidates wanted and we refused to be persuaded. And so we were rejected by Churchill Livingstone. This was a very depressing eventuality! I resurrected the original three-year-old offer letter from Blackwell Scientific Publications and made an appointment to see the Editorial Director – Peter Saugman. I turned up at his office carrying the massive manuscript and told him the tale. Wearing his very experienced publisher hat, he instantly and completely understood the Churchill Livingstone reaction but also understood something from my passion and certainty about the market for the book. He explained that he was breaking every publishing rule but that he was senior enough to do that and that he would go ahead and publish it in full on a hunch. In 1986, he was rewarded by the appearance of a 400-page textbook-sized book, which rapidly became one bought and studied by almost every MRCP candidate. Indeed, that original red and blue edition can be found on the bookshelves either at home or in the offices of nearly every medical specialty consultant in the UK.

After this, our first and best, we all pursued solo careers, with Afzal making clinical videos of patients depicting how to examine them, and writing other books such as An Atlas of Clinical Diagnosis (Saunders Ltd, second edition, 2003), Anne developing services for the elderly and people with stroke in Gwent, and me pursuing diabetes clinical research in various areas. Meanwhile, Anne in particular continued to accumulate survey data and in the second half of the 1990s we came together again to make the second, blue and yellow, edition of the book (1999). The surveys (which by this stage were very extensive indeed) had uncovered a further 50 short cases that needed to be included and the original material all needed updating.

Then, in 2001, the Royal Colleges changed the clinical exam to PACES. Until then the short cases exam had been a room full of patients of all different kinds with the candidate being led round them at random – according to the examiner’s whim – for exactly 30 minutes. Anything from four to 11 patients might be seen. This was now transformed into Stations 1, 3 and 5 of the PACES exam, each 20 minutes long, thus doubling the time spent with short cases and ensuring that patients from all the main medical specialty areas were seen by every candidate. Hence, An Aid to the MRCP Short Cases was transformed into An Aid to the MRCP PACES Volume 1, with the short cases divided into sections according to the Stations. Specialists helped us more than ever with the updating and by now surveys had revealed that there were 20 respiratory cases that might occur, 19 abdominal cases, 27 cardiovascular cases, 52 central nervous system cases, 51 skin cases, 19 locomotor cases, 18 endocrine cases, 21 eye cases and eight ‘other’ cases. The long case and viva sections of the old clinical exam were replaced by Stations 2 (History taking) and 4 (Communications and ethics). To help us with these we recruited new blood – a bright and enthusiastic young physician who had recently passed the MRCP – Dev Banerjee, and he led on the Volume 2 project. Dev now confesses that ‘one of the hardest aspects of writing Volume 2 back then before 2003 was coming up with enough surnames. You cannot believe how hard it was. Should I refer to the Bible? Should I refer to the Domesday Book? I decided in the end, as I had grown up in Leeds and supported Leeds United all my life, to use the 1970s Leeds United team sheet for surnames. It’s not obvious, but if you look carefully, it is there!’. Finally, in 2003, the third edition was published in silver and gold.

After many years intending to do this, we also created a medical student version of the short cases book on the grounds that medical student short cases exams are essentially the same as the MRCP in that it is the same pool of patients and the examiners are all MRCP trained so that is how they think. However, whilst most MRCP candidates continue to use our books, most medical students have not discovered their version – it has the wrong title because medical students no longer have short cases exams – they have OSCEs! Those who have discovered it report that they have found it useful for their OSCEs.

And now the Royal Colleges have changed the exam again. And so An Aid to the MRCP PACES has become a trilogy. Stations 1 and 3 remain roughly the same and hence Volume 1 covers Stations 1 and 3 and Volume 3 has been created to deal with the new style of Station 5. Each short case has been checked and updated by one or more specialist(s) and these are now acknowledged at the start of the station concerned against the short case they have taken responsibility for. The same applies
to the short cases in Station 5. Nevertheless, I have personally checked every suggestion and update and took final editorial responsibility, changing and amending as I thought fit. The order of short cases was again changed according to new surveys (now done online) and yet again a few more new short cases were found from surveys: only four for Volume 1 – kyphoscoliosis and collapsed lung for Respiratory, PEG tube for Abdominal and Ebstein’s anomaly for Cardiovascular. New young blood has again been recruited – a further two bright, young and enthusiastic physicians. The updating of Volume 2 covering Stations 2 (History taking) and 4 (Communications and ethics) has been led by Nithya Sukumar. For Volume 3, covering the new Station 5, Ed Fogden has created the new Section H (Integrated clinical assessment).

We are grateful to Julie Elliott from Wiley Blackwell for collecting, in person, the manuscripts edited by the specialists to ensure no possibility of them being lost, for the initial processing of these manuscripts and for overseeing the production of all three volumes; and we are especially grateful to Helen Harvey, freelance project manager for Wiley Blackwell, for working with us painstakingly on every word, and every page of the trilogy which is now the fourth edition. Throughout this process she had maintained her calm, cheerful efficiency and kept us all in line with her enduring support, patience and understanding.

We are grateful to the specialists, now listed in the appropriate sections, who have checked and updated the short cases in their specialties in Volumes 1 and 3, and who helped Ed Fogden with the scenarios in Section H, Volume 3; and we are especially grateful for the enthusiasm with which they have done this despite the considerable workload involved. We are grateful to Mrs Jane Price, Lead Nurse for Patient Experience, Aneurin Bevan Health Board, for her significant input to the section on Station 4. Her knowledge/experience in communication skills and medical ethics and her years of experience in dealing with these situations in clinical practice and guiding doctors in real-life scenarios have given great insight into the needs of PACES candidates. She has, therefore, contributed significantly to the development of the new cases included in this edition, and she also updated and enhanced the Introduction to Section E, Volume 2. Our surveys have always dictated the content of the books and so we are especially grateful to all the PACES candidates who have taken the trouble to fill in the online MRCP PACES survey at www.ryder-mrcp.org.uk. Finally, we are particularly grateful to our colleagues for their support in the ongoing project, which is a considerable undertaking, and we reiterate the deep thanks to our families expressed in the previous prefaces to Volume 1.

‘Life is what happens to you while you’re busy making other plans.’

The above, my all time favourite quote, of course can be applied to the candidate who passes when he should have failed and even more so perhaps to the one who fails when he should have passed; especially when this happens more than once as in the case of the SHO working in South Wales mentioned at the the start of this Preface. More so, it seems to me, it is really quite staggering the extent to which this quote seems to apply to life in general.

Bob Ryder
2013

*From The Citadel by A.J. Cronin.
†From the song Shine on You Crazy Diamond by Pink Floyd from the album Wish You Were Here (1975).
‡‘The result comes as a particular shock when you have been sitting exams for many years without failing them.’ Vol. 2, Section F, Quotation 374.
§Vol. 2, Section F, Experience 108.
∥Vol. 2, Section F, Experience 145.
**Vol. 2, Section F, Experience 144.
††Vol. 2, Section F, Experience 175. I measured my pulse just before going in to start this, my final attempt at the MRCP clinical, and the rate I remember is 140 beats/minute, but in retrospect I feel it must have magnified in my mind through the years – nevertheless whatever it was, it was very high. It is clear, though, that stress remains a major component of the exam – see Vol. 2, Section F, Experience 15.
‡‡Vol. 2, Section F, Useful tip 328 and Quotations 349 and 411–415.
§§A prominent character in the Harry Potter books by J.K. Rowling. Highly organized; expert at preparing for and passing exams.
¶¶Lennon and McCartney were the writing partnership of the Beatles with Harrison and Starr as the other members of the band. Similarly Waters and Gilmore for Pink Floyd with Wright and Mason as the other band members. In both cases it is believed that there was a special creativity through the coming together of the different talents of the individuals concerned, though the relationship was sometimes adversarial.
∥∥John Lennon, from the song, ‘Beautiful Boy (Darling Boy)’ from the album Double Fantasy (1980). It is particularly poignant that this quote should come from John Lennon, considering what happened to him later in the year of the quote.
Introduction

‘My Station 5 was a complete nightmare.’*

The MRCP PACES (Practical Assessment of Clinical Examination Skills) exam in general is discussed in the introduction to Volume 1 of *An Aid to the MRCP PACES*, and Volumes 1 and 2 deal with Stations 1–4 of the PACES exam. The volume you are now reading devotes itself entirely to Station 5. In the autumn of 2009, Station 5 changed. Prior to that Station 5 concerned itself with the clinical cases that were not addressed by Station 1 (respiratory and abdominal) and Station 3 (cardiovascular and neurological). These came under the headings Skin, Locomotor, Endocrine, Eyes and Miscellaneous. With the change in format of Station 5, we felt it important to establish what the Colleges’ aspirations and intentions were with regard to these groups of clinical cases. We therefore communicated with the Station 5 group of the MRCP (UK) Clinical Examining Board. The following are quotes from those communications we received from the Colleges:

‘... there is no plan to remove skin, locomotor, endocrine, and eye problems from the clinical issues that may be assessed in the new Station 5. Candidates must prepare to be examined in these areas as they do now.’

‘New Station 5 opens the opportunity to test integrated clinical thinking about a range of clinical problems from the curriculum in a way that junior doctors practise every day – including skin, locomotor, endocrine, and eye problems as well as others. It also offers the opportunity to assess communication skills in a further two encounters and so the new PACES exam is capable of assessing these crucial skills explicitly.’

‘... trainees will then need to think on their feet about real issues relevant to everyday medicine, including the traditional disciplines of old Station 5.’

‘... the existing components of Station 5 can feature in new Station 5 – and so candidates must learn and prepare for these cases. The difference is that the cases will be presented as clinical problems – so the candidate can take a relevant history and examine appropriately and not just look.’

‘There is no intention to replace real patients in Station 5 with actors. It is possible to use surrogate patients in the new Station 5 for particular scenarios – and many real patients do not have physical signs. These are often a good test for the candidate provided they do not know they are facing a surrogate patient. Surrogate patients will form a small minority of encounters – just as we allow at Stations 1 and 3 in the exam now. They are a safety net for the host centre to ensure delivery of candidate assessments when there are problems sourcing patients.’

‘Ophthalmoscopy is specifically included as a skill that candidates may have to demonstrate in the exam – in Station 3 or new Station 5. Additionally, recognition of fundal abnormalities on photographs will continue to feature in the Part 2 written paper.’

Thus, the Colleges made it clear that there was no intention to reduce the requirement for candidates to be skilled in the disciplines of the old Station 5.

If you look through the Station 5 experiences in the 17 recent PACES experiences in Volume 2, Section F, of *An Aid to the MRCP PACES*, you will see that the Colleges’ aspirations have indeed come to pass. The old Station 5 cases are continuing to occur – goitre, exophthalmos, Graves’ disease, hyperthyroidism, acromegaly, psoriatic arthropathy, systemic sclerosis, mixed connective tissue disease, arthropathy associated with inflammatory bowel disease, Marfan’s, swollen knee, psoriasis, rash of uncertain cause, Raynaud’s, pemphigoid, yellow nail syndrome and diabetic retinopathy all being reported and ophthalmoscopy still being called upon to be undertaken.

In view of this we have in this volume, in Section I, provided all the clinical cases from the old Station 5

disciplines that have occurred in the MRCP over the years and have had them updated by specialists in the same way as we did for Stations 1 and 3.

Reading the 17 experiences in Volume 2, there were old Station 5 short cases but with a twist — a diabetic with vision problems that turned out to be due to homonymous hemianopia, a patient with ankylosing spondylitis and a dense hemiplegia, a diabetic with visual problems and diabetic maculopathy, but also possibly amaurosis fugax and a patient with heartburn, dysphagia and breathlessness but only debatable sclerodactyly as evidence of systemic sclerosis.

The Colleges have also achieved their aspirations in that, reading the 17 experiences in Volume 2, it is clear that Station 5 now has further new challenges, as well as the old ones. Cases such as dementia, polymyalgia rheumatica, migrainous headaches requiring the use of an ophthalmoscope, mononeuritis multiplex, falls in a patient with lots of potential causes, headache followed by diplopia, a patient with a pansystolic murmur and SBE, TIA, vasovagal attack, palpitations after cocaine use, watery diarrhoea (an actor), diabetic with collapse with several possible causes and upper motor neurone facial palsy. It is clear that many of these represent the challenges faced in the medical assessment unit (MAU) and we are sure this is the intention of the Colleges in supporting them.

Thus, in Section H, we have addressed the new Station 5. As is clear from the above, from more survey information and from discussions with examiners, whilst the disciplines in the old Station 5 are indeed addressed in the new Station 5, cases can occur from all disciplines. Thus we have, in Section H, provided examples addressing the new exam format, not only from the old Station 5 disciplines but also from other disciplines that have turned up in the exam. Indeed, as the old Station 5 disciplines are addressed so comprehensively in Section I, we have concentrated especially on examples from the other disciplines in Section H. With the possibility of clinical examination skills from any discipline being required in the new Station 5, we have reproduced our examination routines from Volume 1 in Section G of this volume.

The marking system for PACES is subject to change and you should study it at www.mrcpuk.org. At the time of writing, marking was being done in the skills of:

- Physical examination
- Identifying physical signs
- Clinical communication
- Differential diagnosis
- Clinical judgement
- Managing patient concerns
- Managing patient welfare.

The following table shows, at the time of writing, the stations at which each of these skills are tested, with Station 5 in particular highlighted.

<table>
<thead>
<tr>
<th>Skill</th>
<th>Station 1: Respiratory</th>
<th>Station 1: Abdominal</th>
<th>Station 2</th>
<th>Station 3: Cardiovascular</th>
<th>Station 3: Neurological</th>
<th>Station 4</th>
<th>Station 5: Brief clinical consultation 1</th>
<th>Station 5: Brief clinical consultation 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical examination</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Identifying physical signs</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Clinical communication</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Differential diagnosis</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Clinical judgement</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Managing patient concerns</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Managing patient welfare</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Introduction

At the time of writing the system is that, on the marksheet, the examiner in the station concerned gives for each skill being tested in that station one of the following marks:

Satisfactory mark = 2
Borderline mark = 1
Unsatisfactory mark = 0.

If you study the marking system, and you can be bothered to do the analysis, you will be able to work out the minimum number of scores of 2 that you need assuming all other scores are 1. However, in practice, this is probably of limited use because undoubtedly you will be trying to get a score of 2 in everything regardless.

Two things are important, however.

1. At the time of writing the College states on its website that: ‘The onus is on the candidate to demonstrate each of the skills noted on the marksheet for each encounter (see above table) and, in the event that any one examiner decides that a skill was not demonstrated by a candidate in any one particular task, an unsatisfactory mark (score = 0) will be awarded for this skill’. Thus, it is important to always be aware of the station that you are in and to be proactive, as far as you can, in ensuring that you attempt to demonstrate your abilities in each of the headings concerned – the ones that are relevant to that station according to the above table. With regard to Station 5, it is especially noteworthy that it is the only station where all seven skills are being marked simultaneously. Thus in Station 5 more than any other station, you must be very aware of the seven skills and ensure that during the 10 minutes of the Station 5 case, a deliberate effort is made to demonstrate the skills under all seven headings. The marking system with regard to Station 5 is considered further in Section G.

2. It is essential to remember as you move from station to station that all 10 examiners mark independently and as you go into the next station, the examiners have no idea how you did in the station you have just left so essentially you start with a blank sheet with them. If you have done badly in a station and fear you have scored some zeros, these can be compensated for by scoring more 2s in other stations. In the 5 minutes between stations it is crucial to recharge yourself psychologically, forget what has just happened in the station you have left and give yourself a complete fresh start – see ‘Getting psyched up’ in Section A, Volume 1.*

As emphasized above, you should read the first 17 experiences in Volume 2, Section F, of An Aid to the MRCP PACES to find actual accounts of the new Station 5 – please also, whenever you sit the MRCP, whether you pass or fail, fill in our survey at www.ryder-mrcp.org.uk for all the cases you meet, but especially the ones in the new Station 5. It is only because of the candidates in the past who have filled in our surveys that we have the information that we pass on to you. If you find our books useful, please in your own turn do the same – for the candidates of the future.

*See also introductory comment to Station 5, and overall comment on the exam in Vol. 2, Section F, Experiences 1 and 16.
Section G
Examination *Routines*

‘Work out the best method for examination and practise it until it is second nature to you.’

*Vol. 2, Section F, Quotation 348.*
These books exist as they are because of many previous candidates who, over the years, have completed our surveys and given us invaluable insight into the candidate experience. Please give something back by doing the same for the candidates of the future. For all of your sittings, whether they be a triumphant pass or a disastrous fail . . .

Remember to fill in the survey at www.ryder-mrcp.org.uk

THANK YOU
‘The outpatient department layout was very odd and I felt like I was being spun in circles in between stations and literally being herded through doors by the exam staff. This resulted in me attempting to exit my cardiovascular station via a cleaner’s cupboard, much to the examiners’ amusement. Fortunately, my sense of direction was not being assessed and they passed me anyway.’

In this chapter routines are suggested for the clinical assessment of various subsystems. These are readily adaptable to your individual methods. The subsystems are arranged according to the examiners’ standard instructions (e.g. examine the heart, abdomen, hands, etc.). We have retained the original choice of subsystems, which was governed by our first edition surveys, except for the addition of ‘Examine this patient’s knee’ and ‘Examine this patient’s hip’, when PACES was first introduced. Examples of variations of the instruction are given both from our original survey and from our original PACES survey. Even though Stations 1 and 3 are in Volume 1 and Station 5 is now covered in Volume 3, we have kept all the examination routines together as we believe they represent ‘a whole’ and we present them in both Volume 1 and Volume 3. They have, in more or less unchanged form, prepared candidates for the MRCP for over a quarter of a century and, on the grounds that ‘if it ain’t broke, don’t fix it’,† we have left them relatively undisturbed. It is accepted that with the new Station 5, spot diagnosis routines (e.g. ‘What is the diagnosis?’) are likely to be overtly called upon less often. Nevertheless, the conditions lending themselves to spot diagnosis will undoubtedly continue to appear and although the instruction from the examiner may be different, you will still be expected to ‘spot’ the diagnostic clues in your visual survey. Indeed, as is pointed out in the Introduction to Section I, examples of cases in the new Station 5 where spotting the diagnosis early in the new station (where time is so precious) conferred advantage to the candidate, have already been reported to us. The routines as a whole prepare you for the challenge of being able to examine anything wherever that challenge comes in PACES. Under each subsystem a list of the possible short cases is presented in order of their occurrence based on our surveys that led up to the third edition. We have not felt any merit in making any changes for the fourth edition. The percentages given represent our estimate of your chances of each diagnosis being present when you hear the particular instruction.‡ These lists of diagnoses have guided our suggested routines. The latter are broken down into numbered constituents to aid memory and checklists are given in Appendix 1 which match up to the numbered points in the examination routine. The checklists are to help your practice with each subsystem.

The idea is to develop a controlled, spontaneous and flawless technique of examination for each subsystem, so that you do not have to keep pausing and thinking what to do next and so that you do not miss out important steps (see Vol. 2, Section

*Vol. 2, Section F, Experience 3, final comment.
†Accredited to Bert Lance, American businessman, 1977.
‡As with all our survey analyses, we graded the confidence of each candidate in his retrospective diagnosis of each short case seen. The percentages are not meant to add up to 100% because: (i) there are always missing percentages representing those short cases we could not be certain about; (ii) sometimes more than one diagnosis was considered worth counting for one instruction (for example, in order to give you the percentage of ‘heart’ cases with clubbing, when clubbing was present it was counted as well as the underlying cardiac condition). The figures are best used to give an index of the relative importance of the different conditions in terms of frequency of occurrence when you hear a given instruction.
F, Experience 144). Often you will not need the complete sequence in the examination (for example, with regard to the ‘Examine this patient’s chest’ routine, often the examiner will ask you to only examine ‘the back of this patient’s chest’) but it will certainly increase your confidence if you enter the examination armed with the complete routines so that you can adapt them as necessary. The examination methods are supplemented with appropriate hints to avoid common pitfalls and to simplify the diagnostic maze.

The routines are presented in a single section without necessarily being associated with a particular station because our PACES survey has confirmed that many of the routines may be called upon in more than one station. For example, assessment of visual fields may be required in Station 3 for a patient with a hemiplegia who might have homonymous hemianopia, or Station 5 for a patient with acromegaly who might have a bitemporal hemianopia. It is essential that you bear in mind the station you are in when you are given the particular instruction and adapt it accordingly, but you also need to be wary of jumping to conclusions. For example, we are aware of the anecdote from a PACES pilot, hosted by Dr Ryder at City Hospital for the Royal Colleges, of a patient with acromegaly who had had a cerebrovascular accident secondary to acromegalic hypertension; her visual fields were required to be examined in Station 5 and showed homonymous hemianopia! Similarly, the only radial nerve palsy patient to occur in any of our surveys since the 1980s turned up in Station 5, Locomotor, of a PACES sitting. In Vol. 2, Section F, Experience 27 and Anecdote 88, accounts are given of patients with Marfan’s syndrome appearing in Station 1, Respiratory, so it is important to remain open to many possibilities whilst taking into account the station you are in. Finally, as is clear from the cases that have been reported to us as occurring in the new Station 5, the variety of which is discussed in the Introduction to this volume, in the new Station 5 you can be called upon to examine just about any system.

Before dealing with the individual subsystems, we would make some general points. You should avoid repeating the instruction or echoing the last part of it. Refrain from asking questions like: ‘Would you like me to give you a running commentary or give the findings at the end?’ Such a response wastes invaluable seconds which could be used running through the checklist and completing your visual survey. It is like a batsman asking a bowler in a cricket match whether he would like his ball hit for a six or played defensively! You must do what you are best at and hope that the examiner does not ask you to do otherwise. As suggested below, a well-rehearsed procedure suited to each subsystem should make it possible for you to start purposefully without delay.

Your approach to the patient is of great importance. You should introduce yourself to him and ask his permission to examine him. Permission should also be sought for various manoeuvres, such as adjusting the backrest when examining the heart or before removing any clothing. These polite exchanges will not only please most examiners and patients, but will also provide you with an opportunity to calm your nerves, collect your thoughts and recall the appropriate checklist.

*Throughout the book we often use him/his for brevity when we are talking about patients, examiners or candidates, when of course we mean him/her or his/hers.
Although we have continually emphasized the value of looking for signs peripheral to the examiner’s instruction (e.g. examine this patient’s heart, abdomen, chest), we would also like to emphasize that *dithering* may be counterproductive. In the *visual survey*, you should be scanning the patient rapidly and purposefully with a trained eye, not gazing helplessly at him for a long period while you try to decide what to do next. While you are feeling the pulse (heart) or settling the patient lying flat (abdomen), a quick look at the hands should establish whether there are any abnormalities or not. Pondering over normal hands from all angles at great length looks as unprofessional as, indeed, it is. It is of paramount importance to be gentle with the patient. Rough handling (e.g. roughly and abruptly digging deep into the patient’s abdomen so that he winces with pain) has always been a behaviour which will bring you instantly to the pass/fail borderline or below it (see Vol. 2, Section F, Experience 192). The new PACES marking system is now formally seeking to confirm that all the candidates who pass achieve near perfection under the heading ‘Managing Patient Welfare’. At the time of writing, the marking system requires a score of at least 90% under this heading to ensure a pass. Make sure that you cover the patient up when you have finished examining him, and thank him.
‘Examine this patient’s pulse’

Variations of instruction from our original survey

Feel this pulse
Examine this patient’s pulse – look for the cause
Examine this patient’s pulses

Diagnoses from our original survey in order of frequency

1. Irregular pulse (Vol. 1, Station 3, Cardiovascular, Case 8) 44%
2. Slow pulse (Vol. 1, Station 3, Cardiovascular, Case 31) 12%
3. Graves’ disease (Station 5, Endocrine, Case 3) 12%
4. Aortic stenosis (Vol. 1, Station 3, Cardiovascular, Case 5) 9%
5. Complete heart block (Vol. 1, Station 3, Cardiovascular, Case 31) 9%
6. Brachial artery aneurysm 9%
7. Impalpable radial pulses due to low output cardiac failure 9%
8. Tachycardia 6%
9. Takayasu’s disease (Station 5, Other, Case 3) 3%
10. Hypothyroidism (Station 5, Endocrine, Case 5) 3%
11. Fallot’s tetralogy with a Blalock shunt 3 (Vol. 1, Station 3, Cardiovascular, Case 23) 3%

Examination routine

As you approach the patient from the right and ask for his permission to examine him you should:

1. Look at his face for a malar flush (mitral stenosis, myxoedema) or for any signs of hyper- or hypothyroidism. As you take the arm to examine the right radial pulse, continue the survey of the patient by looking at
2. The neck (Corrigan’s pulse, raised JVP, thyroidectomy scar, goitre) and then the chest (thoracotomy scar). Quickly run your eyes down the body to complete the survey (ascites, clubbing, pretibial myxoedema, ankle oedema, etc.) and then concentrate on
3. The pulse and note
4. Its rate (count for at least 15 sec), volume and
5. Its rhythm. A common diagnostic problem is presented by slow atrial fibrillation which may be mistaken for a regular pulse. To avoid this, concentrate on the length of the pause from one beat to another and see if each pause is equal to the succeeding one (see also Vol. 1, Station 3, Cardiovascular, Case 8). This method will reveal that the pauses are variable from beat to beat in controlled slow atrial fibrillation.
6. Assess whether the character (waveform) of the pulse (information to be gained from radial, brachial and carotid) is normal, collapsing, slow rising or jerky. To determine whether there is a collapsing quality, put the palmar aspect of the four fingers of your left hand on the patient’s wrist just below where you can easily feel the radial pulse. Press gently with your palm, lift the patient’s hand above his head and then place your right palm over the patient’s axillary artery. If the pulse has a water-hammer character you will experience a flick (a sharp and tall upstroke and an abrupt downstroke) which will run across all four fingers and at the same time you may also feel a flick of the axillary artery against your right palm. The pulse does not merely become palpable when the hand is lifted but its character changes and it imparts a
sharp knock. This is classic of the pulse that is present in haemodynamically significant aortic incompetence and in patent ductus arteriosus. If the pulse has a collapsing character but is not of a frank water-hammer type then the flick runs across only two or three fingers (moderate degree of aortic incompetence or patent ductus arteriosus, thyrotoxicosis, fever, pregnancy, moderately severe mitral incompetence, anaemia, atherosclerosis). A slow rising pulse can best be assessed by palpating the brachial pulse with your left thumb and, as you press gently, you may feel the anacrotic notch (you will need practice to appreciate this) on the upstroke against the pulp of your thumb. In mixed aortic valve disease, the combination of plateau and collapsing effects can produce a bisferiens pulse. Whilst feeling the brachial pulse, look for any catheterization scars (indicating valvular or ischaemic heart disease).

7 Proceed to feel the carotid where either a slow rising or a collapsing pulse can be confirmed.

8 Feel the opposite radial pulse and determine if both radials are the same (e.g. Fallot’s with a Blalock shunt; see Vol. 1, Station 3, Cardiovascular, Case 23), and then feel the right femoral pulse checking for any radiofemoral delay (coarctation of the aorta). If you are asked to examine the pulses (as opposed to the pulse), you should continue to examine all the other peripheral pulses. It is unlikely that the examiner will allow you to continue beyond what he thinks is a reasonable time to spot the diagnosis that he has in mind. However, should he not interrupt, continue to look for additional diagnostic clues. Thus, in a patient with atrial fibrillation and features suggestive of thyrotoxicosis, you should examine the thyroid and/or eyes. In a patient with atrial fibrillation and hemiplegia or atrial fibrillation and a mitral valvotomy scar, proceed to examine the heart.

See Appendix 1, Checklist 1, Pulse.

2 | ‘Examine this patient’s heart’

Variations of instruction in initial PACES survey (resultant diagnoses in brackets)
Examine this patient’s heart (mitral stenosis)
Examine this patient’s cardiovascular system (mitral valve disease and aortic regurgitation; mitral valve disease; mixed aortic valve disease; prosthetic valves; aortic stenosis; atrial fibrillation and prosthetic mitral valve; corrected Fallot’s tetralogy)
Examine this gentleman’s heart. He has been complaining of palpitations (atrial fibrillation and mitral stenosis)
The GP has referred this 72-year-old lady with a murmur. Please examine her (mitral regurgitation)
This patient has been having palpitations – can you find a cause? (atrial fibrillation and mitral stenosis)
This patient is short of breath. Please examine the heart (mixed aortic valve disease)
You are seeing this elderly lady in the cardiology clinic which she has been attending for some time (prosthetic valve)
This young lady presented with increasing shortness of breath on exertion. Examine the cardiovascular system (aortic incompetence)

This lady has a heart murmur. Please examine her cardiovascular system (mitral stenosis and cerebrovascular accident)

This patient had a myocardial infarct 1 year ago. Please examine the cardiovascular system (aortic stenosis)

This man has been complaining of chest pain and palpitations. Please examine the cardiovascular system (aortic stenosis)

This patient has had an acute episode of breathlessness. Please examine the cardiovascular system (aortic stenosis)

This patient presented with shortness of breath. Please examine the cardiovascular system (mixed mitral valve disease and atrial fibrillation; aortic incompetence)

This gentleman came in on the take 2 days ago and he was breathless. Examine his cardiovascular system (atrial fibrillation and mitral regurgitation)

This man has just returned from the ITU. Please examine his cardiovascular system (prosthetic valves)

This woman, who is about 60 years of age, is becoming increasingly breathless. Can you examine her cardiovascular system and see if you can find a reason? (atrial fibrillation and mitral stenosis)

Look at this patient and describe what you see. Then listen to the heart (Marfan’s syndrome and prosthetic aortic valve)

The GP has noted a murmur – can you tell me what you think? (mixed aortic valve disease)

This man has a heart murmur. Please examine him (mitral regurgitation)

Examine the cardiovascular system (hypertrophic cardiomyopathy)

**Diagnoses from survey in order of frequency**

1. Prosthetic valves (Vol. 1, Station 3, Cardiovascular, Case 1) 17%
2. Mitral incompetence (lone) (Vol. 1, Station 3, Cardiovascular, Case 2) 13%
3. Mixed aortic valve disease (Vol. 1, Station 3, Cardiovascular, Case 6) 9%
4. Mixed mitral valve disease (Vol. 1, Station 3, Cardiovascular, Case 3) 9%
5. Other combinations of mitral and aortic valve disease (Vol. 1, Station 3, Cardiovascular, Case 9) 8%
6. Mitral stenosis (lone) (Vol. 1, Station 3, Cardiovascular, Case 7) 7%
7. Aortic stenosis (lone) (Vol. 1, Station 3, Cardiovascular, Case 5) 7%
8. Aortic incompetence (lone) (Vol. 1, Station 3, Cardiovascular, Case 4) 5%
9. Ventricular septal defect (Vol. 1, Station 3, Cardiovascular, Case 12) 3%
10. Irregular pulse (Vol. 1, Station 3, Cardiovascular, Case 8) 2%
11. HOCM (Vol. 1, Station 3, Cardiovascular, Case 20) 2%
12. Marfan’s syndrome (Station 5, Locomotor, Case 9) 2%
13. Eisenmenger’s syndrome (Vol. 1, Station 3, Cardiovascular, Case 27) 2%
14. Mitral valve prolapse (Vol. 1, Station 3, Cardiovascular, Case 10) 2%
15. Patent ductus arteriosus (Vol. 1, Station 3, Cardiovascular, Case 29) 2%
16. Tricuspid incompetence (Vol. 1, Station 3, Cardiovascular, Case 11) 2%
17. Fallot’s tetralogy/Blalock shunt (Vol. 1, Station 3, Cardiovascular, Case 23) 0.9%
18. Raised jugular venous pressure (Vol. 1, Station 3, Cardiovascular, Case 18) 0.9%
19. Coarctation of the aorta (Vol. 1, Station 3, Cardiovascular, Case 26) 0.9%
Other diagnoses were: chronic liver disease due to tricuspid incompetence (<1%), pulmonary stenosis (<1%), cor pulmonale (<1%), complete heart block (<1%), transposition of the great vessels (<1%), repaired thoracic aortic aneurysm (<1%) and left ventricular aneurysm (<1%).

**Examination routine**

When asked to ‘examine this patient’s heart’, candidates are often uncertain as to whether they should start with the pulse or go straight to look at the heart. On the one hand, it would be absurd to feel all the pulses in the body and leave the object of the examiner’s interest to the last minute, whilst on the other hand it would be impetuous to palpate the praecordium straight away. Repeating the examiner’s question in the hope that he might clarify it, or asking for a clarification, does nothing but communicate your dilemma to the examiner. You should not waste any time. Bear in mind that our survey has confirmed that the diagnosis is usually mitral and/or aortic valve disease. Approach the right-hand side of the patient and adjust the backrest so that he reclines at 45° to the mattress. If the patient is wearing a shirt, you should ask him to remove it so that the chest and neck are exposed. *Meanwhile*, you should complete a quick:

1. **visual survey.** Observe whether the patient is
   - (a) breathless,
   - (b) cyanosed,
   - (c) pale, or
   - (d) whether he has a *malar flush* (mitral stenosis).

   Look briefly at the earlobes for creases* and then at the neck for pulsations:
   - (e) forceful carotid pulsations (Corrigan’s sign in aortic incompetence; vigorous pulsation in coarctation of the aorta), or
   - (f) tall, sinuous venous pulsations (congestive cardiac failure, tricuspid incompetence, pulmonary hypertension, etc.).

   Run your eyes down onto the chest looking for:
   - (g) a *left thoracotomy scar* (mitral stenosis†) or a *midline sternal scar* (valve replacement‡), and then down to the feet looking for:

---

*Frank’s sign: a diagonal crease in the lobule of the auricle: grade 3 = a deep cleft across the whole earlobe; grade 2A = crease more than halfway across the lobe; grade 2B = crease across the whole lobe but superficial; grade 1 = lesser degrees of wrinkling. Earlobe creases are associated statistically with coronary artery disease in most population groups.

†NB: Vol. 2, Section F, Experiences 111 and 114.

‡Other scars may also be noted during your visual survey – those of previous cardiac catheterizations may be visible over the brachial arteries.
(h) ankle oedema. As you take the arm to feel the pulse, complete your visual survey by looking at the hands (a quick look; don’t be ponderous) for
(i) clubbing of the fingers (cyanotic congenital heart disease, subacute bacterial endocarditis) and splinter haemorrhages (infective endocarditis).

If the examiner does not want you to feel the pulse he may intervene at this stage – otherwise you should proceed to
2 note the rate and rhythm of the pulse.
3 Quickly ascertain whether the pulse is collapsing (particularly if it is a large-volume pulse) or not (make sure you are seen lifting the arm up; see Vol. 2, Section F, Experience 144).

Next may be an opportune time to look for
4 radiofemoral delay (coarctation of the aorta), though this can be left until after auscultation if you prefer and if you are sure you will not forget it (see Vol. 2, Section F, Experience 108).
5 Feel the brachial pulse followed by the carotid pulses to see if the pulse is a slow rising one, especially if the volume (the upstroke) is small.

If the pulsations in the neck present any interesting features you may have already noted these during your initial visual survey. You should now proceed to confirm some of these impressions. The Corrigan’s sign in the neck (forceful rise and quick fall of the carotid pulsation) may already have been reinforced by the discovery of a collapsing radial pulse. The individual waves of a large venous pulse can now be timed by palpating the opposite carotid. A large v wave, which sometimes oscillates the earlobe, suggests tricuspid incompetence and you should later on demonstrate peripheral oedema and the pulsatile liver using the bimanual technique. If the venous wave comes before the carotid pulsation, it is an a wave suggestive of pulmonary hypertension (mitral valve disease, cor pulmonale) or pulmonary stenosis (rare). After
6 assessing the height of the venous pressure in centimetres vertically above the sternal angle, you should move to the praecordium and
7 localize the apex beat with respect to the mid-clavicular line and ribspaces, firstly by inspection for visible pulsation and secondly by palpation. If the apex beat is vigorous you should stand the index finger on it, to localize the point of maximum impulse, and assess the extent of its thrust. The impulse can be graded as just palpable, lifting (diastolic overload, i.e. mitral or aortic incompetence), thrusting (stronger than lifting) or heaving (outflow obstruction).
8 Palpation with your hand placed from the lower left sternal edge to the apex will detect a tapping impulse (left atrial ‘knock’ in mitral stenosis) or thrills over the mitral area (mitral valve disease), if present.
9 Continue palpation by feeling the right ventricular lift (left parasternal heave). To do this, place the flat of your right palm parasternally over the right ventricular area and apply sustained and gentle pressure. If right ventricular hypertrophy is present, you will feel the heel of your hand lifted by its force (pulmonary hypertension).
10 Next, you should palpate the pulmonary area for a palpable second sound (pulmonary hypertension), and the aortic area for a palpable thrill (aortic stenosis).†

*The visual survey and the examination steps 2–6 should be completed quickly and efficiently, particularly if you have been asked to examine the heart.

†The thrill of aortic stenosis is best felt if the patient leans forwards with his breath held after expiration.
If you feel a strong right ventricular lift, quickly recall, and sometimes recheck, whether there is a giant \( a \) wave (pulmonary hypertension, pulmonary stenosis) or \( v \) wave (tricuspid incompetence, congestive cardiac failure) in the neck. A palpable thrill over the mitral area (mitral valve disease) or palpable pulmonary second sound over the pulmonary area (pulmonary hypertension) should make you think of, and check for, the other complementary signs. You should by now have a fair idea of what you will hear on auscultation of the heart but you should keep an open mind for any unexpected discovery.

11 The next step will be auscultation and you should only stray away from the heart (examiner’s command) if you have a strong expectation of being able to demonstrate an interesting and relevant sign (such as a pulsatile liver to underpin the diagnosis of tricuspid incompetence). Time the first heart sound with either the apex beat, if this is palpable, or by feeling the carotid pulse (see Vol. 2, Section F, Experience 188). It is important to listen to the expected murmurs in the most favourable positions. For example, mitral diastolic murmurs are best heard by turning the patient onto the left side, and the early diastolic murmur of aortic incompetence is made more prominent by asking the patient to lean forwards with his breath held after expiration.* For low-pitched sounds (mid-diastolic murmur of mitral stenosis, heart sounds), use the bell of your chest-piece but do not press hard or else you will be listening through a diaphragm formed by the stretched skin! The high-pitched early diastolic murmur of aortic incompetence is very easily missed (see Vol. 2, Section F, Anecdote 276). Make sure you specifically listen for it.

If the venous pressure is raised you should check for

12 sacral oedema and, if covered, expose the feet to demonstrate any ankle oedema. Auscultation over

13 the lung bases for inspiratory crepitations (left ventricular failure), though an essential part of the routine assessment of the cardiovascular system, is seldom required in the examination. You may make a special effort to do this in certain relevant situations such as a breathless patient, aortic stenosis with a displaced point of maximum impulse or if there are any signs of left heart failure (orthopnoea, pulsus alternans, gallop rhythm, etc.). Similarly, after examination of the heart itself it may (on rare occasions only) be necessary to

14 palpate the liver, especially if you have seen a large \( v \) wave and heard a pansystolic murmur over the tricuspid area. In such cases you may be able to demonstrate a pulsatile liver by placing your left palm posteriorly and the right palm anteriorly over the enlarged liver.† Finally, you should offer to

15 measure the blood pressure. This is particularly relevant in patients with aortic stenosis (low systolic and narrow pulse pressure), and aortic incompetence (wide pulse pressure).

See Appendix 1, Checklist 2, Heart.

*With the diaphragm of your chest-piece ready in position: ‘Take a deep breath in; now out; hold it’. Listen intently for the absence of silence in early diastole. Ask the patient to repeat the exercise if necessary.

†An alternative and useful way of demonstrating a pulsatile liver is to place the knuckles of your closed right fist against the inferior border of the liver in the right hypochondrium (warn the patient beforehand!). Your fist will oscillate with each pulsation of the liver.