

Anatomy Vivas For The iMRCs

Nick A. Aresti,
Manoj Ramachandran
and Mark D. Stringer

CAMBRIDGE

Medicine

CAMBRIDGE

more information - www.cambridge.org/9781107672994

Anatomy Vivas for the Intercollegiate MRCS

Anatomy Vivas for the Intercollegiate MRCS

Nick A. Aresti

Core Surgical Trainee in the London Deanery, London, UK

Manoj Ramachandran

Consultant Orthopaedic and Trauma Surgeon (Paediatric and Young Adult), Barts Health NHS Trust, London, England and Honorary Senior Lecturer, William Harvey Research Institute, Barts and The London School of Medicine and Dentistry, Queen Mary's, University of London, UK

Mark D. Stringer

Professor of Anatomy at the University of Otago, Dunedin, New Zealand and Chair of the Anatomy Committee, Royal Australasian College of Surgeons



CAMBRIDGE
UNIVERSITY PRESS

CAMBRIDGE UNIVERSITY PRESS
Cambridge, New York, Melbourne, Madrid, Cape Town,
Singapore, São Paulo, Delhi, Mexico City

Cambridge University Press
The Edinburgh Building, Cambridge CB2 8RU, UK

Published in the United States of America by Cambridge University Press, New York

www.cambridge.org

Information on this title: www.cambridge.org/9781107672994

© Cambridge University Press 2012

This publication is in copyright. Subject to statutory exception
and to the provisions of relevant collective licensing agreements,
no reproduction of any part may take place without
the written permission of Cambridge University Press.

First published 2012

Printed in the United Kingdom at the University Press, Cambridge

A catalogue record for this publication is available from the British Library

Library of Congress Cataloging-in-Publication Data

Anatomy vivas for the intercollegiate MRCS / [edited by] Nick Aresti, Manoj Ramachandran,
Mark Stringer.

p. cm.

ISBN 978-1-107-67299-4 (Paperback)

1. Human anatomy—Examinations, questions, etc. 2. Anatomy, Surgical and topographical—
Examinations, questions, etc. I. Aresti, Nick. II. Ramachandran, Manoj. III. Stringer, Mark.

QM32.A658 2012

612.0076—dc23

2012008942

ISBN 978-1-107-67299-4 Paperback

Cambridge University Press has no responsibility for the persistence or
accuracy of URLs for external or third-party internet websites referred to
in this publication, and does not guarantee that any content on such
websites is, or will remain, accurate or appropriate.

Every effort has been made in preparing this book to provide accurate and up-to-date information
which is in accord with accepted standards and practice at the time of publication. Although case
histories are drawn from actual cases, every effort has been made to disguise the identities of the
individuals involved. Nevertheless, the authors, editors and publishers can make no warranties that
the information contained herein is totally free from error, not least because clinical standards are
constantly changing through research and regulation. The authors, editors and publishers therefore
disclaim all liability for direct or consequential damages resulting from the use of material contained
in this book. Readers are strongly advised to pay careful attention to information provided by the
manufacturer of any drugs or equipment that they plan to use.

Dedicated to my parents, Ari and Niki

Nick Aresti

For my beautiful girls Joanna, Izzy and Mia

Manoj Ramachandran

To my wonderful children Paul, Stephen and Catherine

Mark Stringer

Contents

<i>List of authors</i>	<i>page</i> viii
<i>Acknowledgments</i>	ix
Introduction	1
1 Limbs and vertebral column questions	4
2 Limbs and vertebral column answers	17
3 Thorax questions	46
4 Thorax answers	53
5 Abdomen and pelvis questions	64
6 Abdomen and pelvis answers	71
7 Head and neck questions	88
8 Head and neck answers	96
<i>Index</i>	111

Authors

Nick A. Aresti BSc MBBS MRCS FHEA

Core Surgical Trainee, London Deanery, London

Manoj Ramachandran BSc(Hons) MBBS(Hons) MRCS(Eng) FRCS(Tr&Orth)

Consultant Orthopaedic and Trauma Surgeon (Paediatric and Young Adult), Barts Health NHS Trust, London, England and Honorary Senior Lecturer, William Harvey Research Institute, Barts and The London School of Medicine and Dentistry, Queen Mary's, University of London, London

Mark D. Stringer BSc MS FRCP FRCS FRCSPaed FRCSEd

Professor of Anatomy at the Department of Anatomy, University of Otago, Dunedin, New Zealand, Chairman of the Anatomy Committee, Royal Australasian College of Surgeons

Acknowledgments

We would like to thank several people for their contribution to this book.

- Nick Dunton, Senior Commissioning Editor and Rob Sykes, Assistant Editor, Cambridge University Press.

Nick and Rob were ever present, providing expert opinion and advice. Without their help and enthusiasm, this book would not have been possible.

- Dr Catherine Molyneux, Director of Anatomical Studies, Queen Mary's School of Medicine and Dentistry.

Cathy not only provided many of the fantastic images seen in this book, but also granted us access to the anatomy laboratory at Queen Mary's University to take photographs.

- Brynley Crosado (Prosector) and Chris Smith (Curator) of the W. D. Trotter Anatomy Museum at the University of Otago, for the inclusion of selected images.

- Stephanie Constantine.

We would like to thank Stephanie for her help, support and modelling.

- Panos Michaelides.

Panos provided his expertise and support during preparation of the images.

- Bhavin Upadhyay.

Bhavin provided us with some of the radiographic images seen in this book.

Introduction

The MRCS (Membership of the Royal College of Surgeons) exam has undergone drastic changes in recent years, one of the most significant being the way in which anatomy is examined. As a candidate sitting the exam it is essential that you spend the necessary time learning your anatomy in sufficient detail not only to pass the exam, but also to continue your surgical training. In the process it is vital that you understand the exam structure and adapt your learning style accordingly.

Although this book has been designed primarily as a revision guide and a learning tool, it has been put together in a manner that is very similar to the structure of the anatomy vivas in the exam. The questions are clinically orientated and are based around themes and clinical scenarios. Photographs of cadavers and prosections, simple diagrams, radiography and photographs of actors are all incorporated into the text to ensure the questions are as similar as possible to the questions in the actual exam.

Most of the topics which have been examined in the new exam system are covered in significant detail in this book. It is no secret that the College is only able to write so many questions and so there is a lot of repetition. Learning the contents of this book will therefore aid your performance in the exam. You must however be wary that you may well be the subject of a completely new anatomy viva station, so do not get lulled into a false sense of security and only learn the topics that have come up in the past.

Use this book in combination with anatomy textbooks and video tutorials. You may never have been examined in the format employed in the exam, particularly on basic science topics. In preparation therefore, practice reciting your answers out loud to colleagues, friends, family or even pets if you have to.

No doubt you will have many a sleepless night and anxious moments in the lead up to your exam. As someone who has recently been through the exam and then helped friends through, let this reassure you: as long as you study hard and take heed of the advice presented here and elsewhere, you stand a good chance of passing. The new exam is a fair test of those who are properly prepared.

The MRCS exam

To become a member of the Royal College of Surgeons, you must pass part A and part B of the exam (and of course part with the subscription and annual fees). Part A involves two multiple-choice papers, and part B is an Objective Structured Clinical Examination (OSCE) consisting of 18 examined stations alongside preparation and rest stations. All stations are now ‘manned’, i.e. have an examiner present who will be asking you questions. Note that the new-style system did originally have some ‘unmanned’ stations before the exam was slightly revamped.

Each OSCE station will examine you on one or more of four broad content areas. You receive a mark for each area and must pass all of them in order to receive an overall pass. The four areas are:

- *Anatomy and surgical pathology*
- *Applied surgical science and critical care*
- *Communication skills in giving and receiving information and history taking*
- *Clinical and procedural skills.*

When applying for the exam, you will be asked to pick specialty context areas which will influence the content of part of your exam. This is designed to meet the emerging intention of trainees with regard to their chosen subspecialty. The four areas as stipulated by the examinations board are:

- *Head and neck*
- *Trunk and thorax*
- *Limbs (including spine)*
- *Neuroscience.*

It should be noted that the specialty area named ‘trunk and thorax’ is a misnomer: the term ‘trunk’ of course includes the thorax.

You will be asked to pick a first, second and third choice specialty. Your first choice will be examined in three stations: an anatomy/pathology viva station, a history taking station and a physical examination station. Your second specialty choice will be examined in two stations: a history taking station and a physical examination station. Finally your third specialty choice will be examined only in a physical examination station.

The anatomy and surgical pathology broad content area is normally examined in 4 of the 18 stations. They are typically the same style in every exam and are laid out as follows:

1. *An anatomy viva based on the first-choice specialty area.*

This, the only specialty-specific station in the anatomy and pathology broad content area, is a complicated anatomy viva which is in more detail than the generic anatomy stations.

2. *Two ‘generic’ anatomy viva stations.*

The theme of the generic stations is not related to the specialty choices you pick, and may therefore be based on any of the four specialty choices. Therefore if you pick limbs, thorax and neurosciences for your specialty choices, you may still get a viva based on the larynx or thyroid gland (i.e. head

and neck). So far, we know of no-one who has been examined on neuroanatomy in a generic anatomy station after *not* picking neurosciences as their first choice specialty.

3. *A pathology viva station.*

All pathology stations involve a structured viva independent of the specialty choices.

What does this mean for the exam and for your revision? As already touched on, it is a common misconception that you only need to learn the anatomy relevant to your specialty choices. Other than detailed neuroanatomy, all anatomy must be learnt in sufficient detail. We do however recommend that you ensure the anatomy relating to your first-choice specialty is your strongest topic, as you are guaranteed a grilling in this area!

Anatomy is only examined in 3 of the 18 stations. Other areas such as communication skills carry approximately the same weight in the exam. It would be wise to split your revision time between your educational needs with the structure of the exam in mind.

With regard to the rest of the exam, a few words of advice: pathologies presented are not the rare and unusual conditions suggested by other commonly used MRCS revision guides. They are diseases which you will almost certainly have come across in your clinical practice. For example, osteoarthritic knees, or lower limbs with peripheral vascular disease are very common in the limbs and spine stations; thyroid nodules and salivary gland swellings are common in the head and neck stations; and incisional hernias and 'acute' abdomens in the trunk stations.

Another commonly failed broad content area is the critical care section. The contents of this area is beyond the remit of the book. However we can say that the questioning follows the logical sequences which can be found in the CCrISP (Care of the Critically Ill Surgical Patient) course-books.

In summary, learn your anatomy, learn it well and practise describing what you have learnt. Understand and appreciate the structure of the exam and modify your revision accordingly. Do not ignore any of the possible topics that may come up in your exam, be it anatomy of the parotid gland or the seven hand-washing steps. Finally, be confident in your knowledge and confident in your answers.

The very best of luck!

Limbs and vertebral column questions

Question 1

Scenario:

A young man is walking along a road when a car travelling at 30 mph (48 km/h) drives past. The side-view mirror strikes his right shoulder and he sustains an injury to his humerus.



Image 1.1

With regards to **Image 1.1**:

- I. Identify the greater tubercle.
- II. Identify the lesser tubercle.
- III. Identify the anatomical neck of the humerus.
- IV. Identify the surgical neck of the humerus.

A radiograph shows a fracture at the site marked on Image 1.1.

- V. What nerve is at risk following this type of injury?
- VI. What clinical features would be present if the nerve was damaged?
- VII. Which nerve runs in the spiral groove of the humerus?
- VIII. If a fracture was to injure this nerve, what clinical findings might be expected?
- IX. What muscles attach to the coracoid process, and what nerves innervate them?
- X. At what site is the clavicle most commonly fractured?
- XI. In which direction are the resultant fragments displaced? Explain your answer.

Question 2

Scenario:

You are the surgical registrar on call. A young man is referred urgently, having been stabbed in his right axilla.

- I. Define the boundaries of the axilla.
- II. What major structures in the axilla could potentially be damaged?
- III. To what structure are the cords of the brachial plexus intimately related?
- IV. If the patient had been stabbed through the anterior aspect of his axilla, through what layers would the knife have passed to reach the structure mentioned in III?

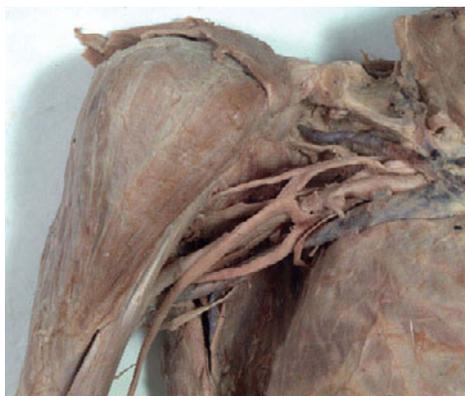


Image 1.2

With regards to **Image 1.2**:

- V. Identify the structure referred to in III.
- VI. Identify the medial and lateral cords of the brachial plexus.
- VII. Name the branches of both of these cords.
- VIII. Identify the major branches of the lateral cord in the above dissection.
- IX. What are the root values of the musculocutaneous, median, ulnar, radial and axillary nerves?
- X. Which muscles are supplied by the musculocutaneous nerve?
- XI. What does the musculocutaneous nerve continue as?
- XII. What clinical features would you expect if the musculocutaneous nerve was to be severed by this injury?

Question 3

Scenario:

A patient is complaining of pain on abduction of his shoulder.

- I. What type of joint is the shoulder joint?
- II. What factors contribute to the stability of the shoulder joint?
- III. What muscles make up the rotator cuff, and what nerves innervate them?

(a)



(b)

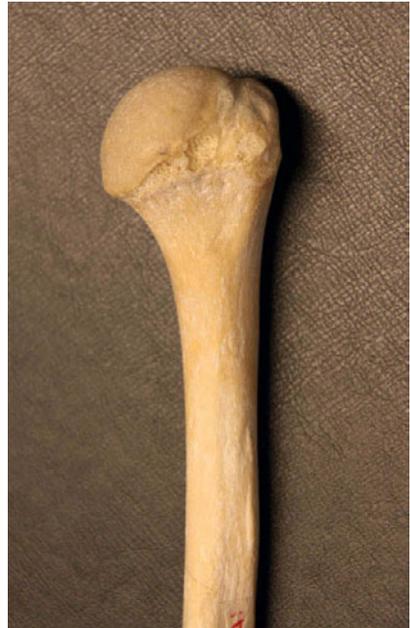


Image 1.3

With regards to **Image 1.3**:

- IV. Using figure 1.3, demonstrate where each of the rotator cuff muscles insert.

- V. On a colleague, demonstrate the following movements: flexion and extension, abduction and adduction, and internal and external rotation. What muscles are responsible for each action?
- VI. On this same subject, isolate and test the function of the subscapularis muscle.
- VII. Which nerve(s) innervates the serratus anterior muscle?
- VIII. What are the consequences if this nerve is damaged?
- IX. Demonstrate how you would test for a lesion of this nerve on a patient.

Question 4

Scenario:

You are in the accident and emergency (A&E) department teaching medical students how to perform an upper limb venepuncture and to take a radial artery blood gas sample.



Image 1.4

With regards to [Image 1.4](#):

- I. Point to and name three vessels in this image that could be used for venepuncture.
- II. What are the boundaries of the cubital fossa?
- III. What major nerve could potentially be damaged when taking a sample of blood from a vein within the cubital fossa?
- IV. Describe the functions of this nerve.
- V. What examination can you perform prior to taking an arterial blood gas sample to assess the adequacy of the radial and ulnar arterial supply to the hand?

Whilst teaching the students, a patient is admitted having sustained hand trauma whilst operating machinery at work.

- VI. Where do the tendons of the flexor digitorum profundus muscle insert?
- VII. Where do the tendons of the flexor digitorum superficialis muscle insert?
- VIII. How can you test the function of each of these two muscles?
- IX. Is handgrip strongest when the wrist is flexed or extended? Explain the reason behind the answer.
- X. What does the flexor tendon pulley system consist of?
- XI. What are the contents of the carpal tunnel?
- XII. What are the boundaries of the anatomical snuffbox?
- XIII. What are the contents of the anatomical snuffbox?

Question 5

Scenario:

A patient from A&E who is complaining of a cold and pale foot is referred to you. The A&E officer is concerned that the patient has an acutely ischaemic foot. You are called to examine the patient's lower limb.

- I. Describe the surface landmarks of the femoral artery.
- II. Describe the surface landmarks of the dorsalis pedis artery.
- III. Describe the surface landmarks of the posterior tibial artery.
- IV. What structures run behind the medial malleolus?

You discover the patient has absent pulses distal to his femoral pulses. You decide to perform an ABPI examination.

- V. What does ABPI stand for?
- VI. How would you perform an ABPI examination?
- VII. What ABPI result would contraindicate the use of thromboembolic deterrent (TED) stockings?