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978-1-107-67299-4 - Anatomy Vivas for the Intercollegiate MRCS

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

Excerpt

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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.

2 Introduction

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!

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1

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.

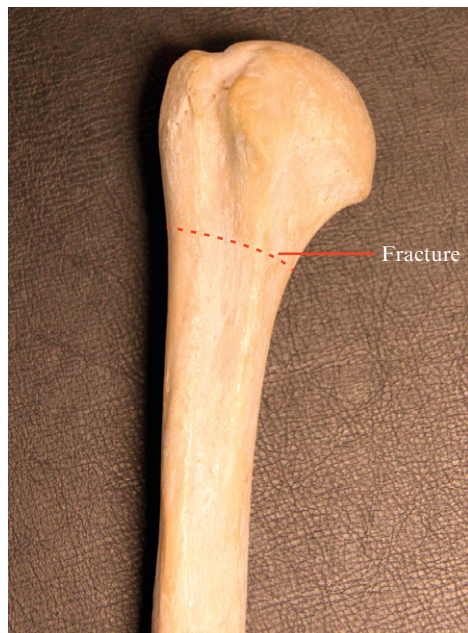


Image 1.1

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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?

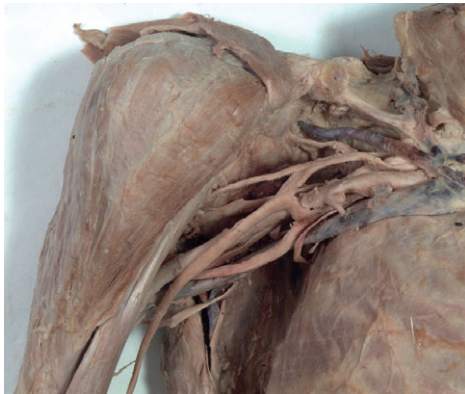


Image 1.2

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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.

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- 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

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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?

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Image 1.5

VIII. In the angiogram shown in Image 1.5, which major artery is occluded?

With regards to the superficial venous drainage of the lower limb:

- IX. What are the landmarks of the great (long) saphenous vein?
- X. What nerve accompanies the great saphenous vein?
- XI. What is the surface marking of the small (short) saphenous vein?

Question 6

Scenario:

A patient is admitted with a fractured neck of femur.

With regards to Image 1.6:

- I. Identify the head.
- II. Identify the neck.
- III. Identify the greater trochanter.
- IV. Identify the lesser trochanter.
- V. Describe the blood supply to the head of the femur.
- VI. Identify where the capsule of the hip joint is attached to the femur.
- VII. What fused bones make up the pelvic girdle?
- VIII. What factors maintain stability of the hip joint?
- IX. What are the principal hip flexors?
- X. What nerve(s) supply these muscles?
- XI. Show the attachment of these muscles on Image 1.6.
- XII. What muscles would you come across when performing a posterior approach to the hip?

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Image 1.6

- XIII. What muscles attach to the greater trochanter?
- XIV. What nerve supplies the two muscles attached to the greater trochanter arising from the ilium?
- XV. What is their main function?
- XVI. Demonstrate a clinical sign testing for the function of these muscles.
- XVII. When would this test be positive?

Question 7

Scenario:

A patient presents with a lump in his popliteal fossa.

- I. What are the boundaries of the popliteal fossa?

With regards to Image 1.7:

- II. Identify the following structures:
 - a. common fibular (peroneal) nerve
 - b. tibial nerve
 - c. popliteal vein
 - d. popliteal artery.