

**Semmelweis University**  
**Department of Anatomy, Histology and Embryology**  
**2020/2021**

**Faculty of Medicine**  
**1st year**

# **MACROSCOPIC ANATOMY HANDBOOK**



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# Macroscopic Anatomy I

## TEACHING DEPARTMENT:

SEMMELWEIS UNIVERSITY

Department of Anatomy, Histology and Embryology

Budapest, Tűzoltó utca 58.

H-1094 Budapest

<http://semmelweis.hu/anatomia>

## LEARNING OBJECTIVES

**Aims of the lectures in anatomy:** Presentation of the important and/or complicated chapters such as introductory chapters, thorax, pelvis, hand, foot, skull, heart, chapters of the visceral organs, central nervous system, organs of special senses, topographical anatomy.

**Aims of the practical sessions in the dissecting room:** Based on the weekly programs (see separate), students will both observe prosected cadaver specimens (bones, joints, muscles, viscera, brain) and perform dissections on parts of, or on an entire, embalmed cadaver.

Students are supervised by the lab instructors. Bones, joints, muscles and peripheral nervous system will be primarily taught in the dissecting room.

**LECTURES:** First semester: 1x 45 min; second semester: 2x 45 min.

**PRACTICAL CLASSES:** First semester: 6x 45 min; second semester: 7x 45 min.

**ECTS CREDITS:** Altogether 16 (first semester: 7; second semester: 9).

**MIDTERM TESTS:** Oral and/or written

## ACCEPTENCE OF THE SEMESTER:

Active participation in dissection room sessions is obligatory for every student. Students should attend at least 75% of the scheduled hours to gain a signature proving the validity of the semester. Absences are therefore limited in 25%. Attendance will be recorded in the dissection room classes.

## TYPE OF EXAMS: oral and written

First semester: semifinal examination, second semester: final exam

**Semifinal and final examinations consist of written and oral (practical and theoretical) parts**

1. Written pretest (e-learning module – access to SeKA account is obligatory)
2. Macroscopic Anatomy (identification of structures on true anatomical specimens) including relevant theoretical questions

## COURSE DESCRIPTION

### Macroscopic Anatomy I.

#### Lectures and dissection classes

**Subject matter:** Macroscopy and clinically oriented anatomy of the parts of the musculoskeletal system, i.e. osteology, arthrology and myology, together with the vascular and nervous supply of the limbs and the trunk. Skull. Cavities, muscles and internal organs of the Head & Neck region.

**Credits: 7**

**Prerequisite:** none

**Academic Year 2020/2021**  
**Faculty of Medicine**

**EM I. Macroscopic Anatomy I.**

Weeks	Lectures (online)	Lecturer	Departmental personal consultations <i>Selected days</i>	Groups in lecture halls		Dissection classes (90 minutes)  <i>EM 1-6 Tue 8.00, Wed 12.45, Fri 10.00</i> <i>EM 7-12 Mon 12.00, Tue 10.00, Thur 11.00</i> <i>EM 13-17 Tue 8.00, Wed 12.45, Fri 10.00</i> <i>EM 18-22 Mon 10.00, Wed 14.30, Fri 12.30</i>
				Lenhossék Wed 11.50	Huzella Thu 12.45	
Week 1 09. 7-11.	1. General introduction, terminology	Szél	-	-	-	General introduction to practical work in the dissection room, tools and rules Upper limb, bones
Week 2 09. 14-18.	2. Joints and movements of the shoulder and shoulder girdle	Alpár	-	-	-	Upper limb Bones and joints
Week 3 09. 21-25.	3. Joints and movements of the elbow	Csáki	-	-	-	Upper limb Dissection of the muscles, vessels and nerves
Week 4 09.28 -10. 2.	4. Joints and movements of the hand	Dóra	-	-	-	Upper limb Dissection of the muscles, vessels and nerves
Week 5 10. 5-9.	5. Pelvis. Joints and movements of the hip	Pálfi	<b>1.1 Limbs*</b>	<b>EM 1-5 Katz</b>	<b>EM 7-12 Barna</b>	Lower limb, bones and joints Dissection of joints of the lower limb
Week 6 10. 12-16.	6. Joints and movements of the knee	Hanics	<b>1.2 Limbs *</b>	<b>EM 6, 13-16 Katz</b>	<b>EM 15, 17-22 Barna</b>	Lower limb Dissection of the muscles, vessels and nerves Cadaver and free limb dissection
Week 7 10. 19-23. <i>Friday Oct 23.</i>	7. Joints and movements of the foot	Vereczki	-	-	-	Lower limb and pelvis Dissection of the muscles, vessels and nerves Cadaver and free limb dissection  <b>1. Midterm test (oral): Upper and lower limbs including the girdles. NO CLASSES ON FRIDAY</b>
Week 8 10. 26-30.	8. Composition of thorax, diaphragm	Szél	-	-	-	Dissection of the limbs and superficial regions of the the trunk (cadaver). Demonstration of the components of the body wall on prosected specimens
Week 9 11. 2-6.	9. Composition of the abdominal wall. Inguinal and femoral canals	Katz	-	-	-	Dissection of the limbs and superficial regions of the the trunk (cadaver). Demonstration of the components of the body wall on prosected specimens
Week 10 11. 9-13.	10. Composition and movements of the vertebral column	Kozsurek	<b>2.1 Trunk</b>	<b>EM 1-5 Kocsis</b>	<b>EM 7-12 Székely</b>	Dissection of the limbs and superficial regions of the the trunk (cadaver). Demonstration of the components of the body wall on prosected specimens
Week 11 11.16-20.	11. Composition of the skull. Sphenoid, ethmoid. Cavities of the viscerocranium	Altdorfer	<b>2.2 Trunk</b>	<b>EM 6, 13-16 Kocsis</b>	<b>EM 15, 17-22 Székely</b>	Bones of the skull Internal and external skull bases Bones of the facial skeleton, mandible. Orbit, nasal cavity, pterygopalatine fossa Head and neck specimens Muscles, fasciae and movements of the neck.
Week 12 11. 23-27	12. Temporomandibular joint, muscles of mastication. Neck muscles and movements, cervical fasciae	Ádám	-	-	-	Head and neck specimens Topography of the superficial regions Temporomandibular joint Muscles of mastication and facial expression  <b>2. Midterm test (e-learning type)</b> Bones, joints, muscles and fasciae of the trunk and neck
Week 13 11.30-12.4.	13. Oral cavity, palate, faucial isthmus, pharynx	Kálmán	<b>3.1 Head/ neck internal organs</b>	<b>EM 1-5 Kozsurek</b>	<b>EM 7-12 Barna</b>	Dissection of superficial regions of the head and neck. Demonstration of the cavities on prosected specimen
Week 14 12.7-11.	14. Nasal cavity, paranasal sinuses, larynx	Székely	<b>3.2 Head/ neck internal organs</b>	<b>EM 6, 13-16 Kozsurek</b>	<b>EM 15, 17-22 Barna</b>	Dissection of superficial regions of the head and neck. Demonstration of the cavities on prosected specimen

## Lecturing during the 1st semester covid19 protocol

There is only one lecture a week during the 1st semester. Lectures listed in the schedule (see above) will be held as online lectures since a safe social distance would not be possible to keep within the lecture halls.

Lectures (including a voice over) and lecture notes will be uploaded in an educational website (Moodle) of the Semmelweis University where students may access the lectures as well as further study aids. This surface is also used for writing examinations. Here the students may log in via SeKA using a personal name and password.

(<https://itc.semmelweis.hu/moodle/login/index.php>)

In order to help our students we are willing to regularly hold personal consultations in the lecture halls where only the designated groups are entitled to participate. See the schedule for the topics and order of appearance. We expect you to watch the uploaded lectures to gain the most from these consultations where we would summarize the most important core material and you may ask questions.

Please thoroughly check the order of appearance because only members of the listed groups are eligible to participate.

### SUBJECT MATTER OF THE 1<sup>ST</sup> SEMESTER

#### Macroscopic Anatomy I.

Macroscopy and clinically oriented anatomy of the parts of the musculoskeletal system

- osteology
- arthrology
- myology
- vascular and nervous supply of the limbs and the trunk

Skull (viscerocranium, neurocranium).

Internal organs, cavities, muscles of the head & neck region.

#### Test I. (oral, obligatory to attend)

Topics: Gross anatomy of the upper and lower limbs together with their girdles (bones, joints, muscles and fasciae)

Date: 7<sup>th</sup> week TBA (<http://semmelweis.hu/anatomia>)

#### Test II. (written, obligatory to attend)

Topics: Bones, joints, muscles and fasciae of the trunk and head&neck

Date: 12<sup>th</sup> week TBA (<http://semmelweis.hu/anatomia>)

#### Semifinal examination

Topics: Subject matter of the semester

1) Written 'e-learning type' pretest

2) Practical examination including theoretical questions (oral examination)

## EM I ANNOUNCEMENTS

**Evaluation** is made using a five-grade scale (1-5).

**Semester acceptance (i.e. signature):** active participation in dissection room lab sessions (including mid-term tests) is obligatory. Students should attend at least 75% of the scheduled hours to gain a signature proving the validity of the semester.

Absences are therefore limited in **25%**.

**Midterm examinations:** During the semester, both practical and theoretical knowledge will regularly be evaluated. Although a successful midterm result is not required to gain acceptance of the semester we encourage our students to attend to receive an official feed-back on their progress.

Attendance is obligatory at the two midterm tests. Students absent from the test should reattend at a given timepoint or their semester will not be accepted. Anatomy midterms may be oral or written exams. Oral exams, held in the dissection room, are composed of both identification of several structures on the specimen and theoretical questions related to the subject. Written midterm tests are organised as e-learning type examinations where a valid SeKa account (including a user name&password) is required.

**Cadaver preparation / dissection work** – every student is required to produce a fully dissected specimen during the 1st or the 2nd semester to prove excellence and to be exempted from the dissection part of the final examination. The specimen will be evaluated by a departmental jury.

**Exemptions form part of the semifinal examination** - if the average of the two midterm marks is at least 4.00, students are offered to be exempted from the oral (dissection) part of the semifinal examination with the following marks: good (4) - if the midterm results are 4+4 or 3+5; excellent (5)- if the midterm results are 4+5 or 5+5. These students only need to take the written part of the semifinal examination.

Please note that only marks from the first, official, attempt are counted in, marks earned at the retake midterm are not considered. Furthermore, the result of the first attempt cannot be improved by taking the retake midterm.

**Semifinal examinations** are composed of the following parts:

1. **written pretest** (electronic test written in the Moodle system),
2. **oral examination** composed of practical and theoretical questions in Macroscopy, i.e., identification and full description of the morphological features of the relevant body parts. Please note, that relevant theoretical questions may too arise during the practical examination part.

**Please note:** Examinations are usually held twice a week. Students may register for, or deregister from, the examination via the neptun system.

*In case neither the first nor the repeated takes of a semifinal exam have been successful the exam has to be postponed to the following exam period as a 'CV' exam (if there are possibilities left). Students may apply with the department to be exempted from passing the prerequisite*

## **RULES AND REGULATIONS IN THE DISSECTING ROOM**

**IT IS STRICTLY FORBIDDEN TO eat, drink, to chew a gum, or to use music devices / phones. Bags and coats should ALWAYS be left in the lockers PRIOR TO entering the dissecting room. The lockers will have to be locked using your OWN padlocks. Please, remember to keep your valuables always on you, or lock them in the lockers. The department takes no responsibility for lost items.**

### **Students are expected to be prepared for the practical work.**

Everybody is supposed to behave in the dissecting room conforming to the spirit of the site. Loud speech, out-of-place jokes and any kind of behaviour, disregarding the dignity of human corpses, should strictly be avoided.

Students should take care of the equipment of the dissecting room. Do not sit on the dissection tables or stand on the tripod stools to avoid accidents. **Fire and work safety regulations** should be maintained. The dissection room is a hazard area. **Cleanliness and order** should be kept.

**Working** in the dissection room involves the use of **sharp and pointed tools**, injuries should be reported to the lab instructor. The technical personnel will provide first aid when necessary.

The **white lab coats** should be worn while in the dissection room, but should be removed before leaving the dissection room area. The purpose of wearing the lab coats is to protect one's clothing from contacting the cadaver specimen. Furthermore **we strictly advise you to wear closed toed shoes and clothing covering the legs**. In the end of the class, lab coats should be emptied and left in order on the coat hangers. The department is not responsible for valuables left in the dissecting room.

Only the members of the study group can participate in the sessions, visitors may be present only with prior permission by the lab instructor. Students can leave the sessions only with the approval of the lab instructor.

**Photos of the black board drawings can only be made with the agreement of the lab instructor.**

Specimen preparations should be wrapped and labeled. Dissection materials of other groups or individuals should not be handled. Dissected cadaver pieces should be discarded in a designated container and discarded blades have to be collected separately.

Dissecting rooms are closed between 6:00 PM to 8:00 AM and over the weekends (with the exception of special workdays appearing in the schedule). Students may not stay in the dissecting room without the supervision of one of the assistants of the department. In the absence of an instructor, the technical personnel should ask the students to leave the dissecting room.

**SMOKING IS STRICTLY FORBIDDEN ON THE DEPARTMENTAL PREMISES,  
INCLUDING THE GARDEN AND THE YARD**

# WORK / ENVIRONMENTAL PROTOCOL AND INFECTION CONTROL

## GENERAL RULES

1. Students may only enter following **temperature control** at the main entrance.
2. **Masks are to be worn at all times** while on the premises of the Department.
3. Please keep a **1.5 -2 m social distance** towards everybody.
4. Do not touch, or come into close contact with, other people (e.g., no handshakes).
5. Frequently wash your hands using soap and warm water.
6. Sanitise your hand frequently.
7. Do not touch your face or eye.
8. It is **STRICTLY FORBIDDEN** to consume food, drinks or chewing gum **anywhere** on the premises of the department (including lecture halls, dissection rooms, histology laboratories or on the hallways, staircases).
9. Use paper tissues in case you cough or sneeze and dispose of them immediately in the designated bins.

## SPECIFIC RULES CONCERNING THE HISTOLOGY LABORATORIES

1. Use hand sanitizers upon entering.
2. Use **rubber gloves** when touching the keyboard or the mouse of the digital equipment.
3. You may clean the surfaces with wet towels before you start using them.
4. Food and drinks are **strictly forbidden** on the premises of the department.

## SPECIFIC RULES CONCERNING THE DISSECTION ROOMS

1. Lab coats (buttoned up) must be worn in the dissecting room at all time.
2. Use hand sanitizers upon entering. Rubber gloves are provided for dissection.
3. Loose/long hair must be tied back before dissection.
4. Food and drinks are **strictly forbidden** on the premises of the department.
5. Only books, sketch, or notebooks, atlases and dissection tools (as well as ID, cards, phones etc) to be used during the dissection classes are allowed in the labs. All other items should be left in the lockers.
6. Have your own padlock on you to lock your stuff and/or clothes in the lockers
7. No valuable items should be left in the lockers, the department does not bear the responsibility for lost items/valuables.
8. Scalpels, blades and tweezers will have to be carried in a tightly closed and hard box. Please make sure that nobody is harmed when working with the sharp and pointed tools.
9. Accidents must be reported to the teacher first and wounds will be dressed with the help of the dissection room assistants.
10. Lab coats and rubber gloves are to be worn in the dissection room units only! Do not step out (not even for using the washroom) from the dissection unit while still wearing a lab coat.
11. It is strictly forbidden to take bones or other anatomical specimens or samples etc. from the dissecting room.

12. Dry and wet samples must be treated separately. Please wash the gloves during dissection before you start handling bones or dry /plastinated specimen.
13. There is a bell ringing 5 minutes before the end of the practical classes. Then all cadaver specimens will have to be properly wrapped and put away in their bags or boxes.
14. Dissection leftovers should be discarded in the special containers and the trays should be left clean and dry.
15. Dissection tools should be properly washed.
16. Disposable scalpels/blades could be disposed of **in special yellow/red containers designed for sharps and hazardous material**. Gloves must be discarded in labelled bins only, but NEVER in communal/paper waste!
17. The dissection unit may only be left following a thorough handwash using a disinfectant soap.
18. Please make sure that you leave the dissecting room quickly to provide time for the personnel to clean the surfaces between classes.

## **FIRE SAFETY PROTOCOL**

Please make sure to adhere to the rules of fire safety regulation with full compliance, paying special attention to the following:

1. The use of naked light or smoking is **STRICTLY PROHIBITED** on the premises of the Department, including the building and the yard.
2. In case of fire, a loud fire alarm signal is to ring throughout the building. In case of a fire drill, the building must be left organized, with the guidance of the teacher/instructor of the group, using the exits as quick as possible. Escape routes are illustrated on every floor.
3. The use of elevators is **STRICTLY PROHIBITED** during a fire drill.
4. Every lecture room has 3 accessible entrances/exits. Students usually enter and leave through the lower single entrance under normal circumstances. When necessary, i.e. in case of fire, the upper 2 doors could also be opened using the keys kept in the fire cassettes next to the doors.
5. All fire cases or signs/ suspicion of a possible fire should be reported to the teacher of the group.
6. No electrical devices should be plugged in a connector different from the designated ones. Only electrical devices in an intact and perfect condition should be used.



## LIST OF TEXTBOOKS

**Sobotta Atlas of Human Anatomy** (Package), 15th English ed. Musculoskeletal system, internal organs, head, neck, neuroanatomy, By Waschke & Paulsen, ISBN-13: 9780702052507 2013

**Gray's Anatomy for students** with STUDENT CONSULT Online Access, 3rd Edition by R. Drake, A. W. Vogl, A. Mitchel, Elsevier; 2014; ISBN 9780702051319

**THIEME Atlas of Anatomy, General Anatomy and Musculoskeletal System**, 2014 by Schuenke, ISBN: 9781604069228

**THIEME Atlas of Anatomy, Head, Neck and Neuroanatomy**, 2016 by Schuenke, ISBN: 9781626231207

**THIEME Atlas of Anatomy, Internal Organs**, 2016 by Schuenke, ISBN: 9781626231665

**McMinn and Abrahams' Clinical Atlas of Human Anatomy** with STUDENT CONSULT Online Access , 7th Edition By Abrahams, Spratt, Loukas & van Schoor ISBN-13: 9780723436973 , 2013

**Netter: Atlas of Human Anatomy**, Including Student Consult Interactive Ancillaries and Guides, 6th Edition, 2014.

**Human Anatomy, Color Atlas and Textbook**, 6th Edition by J Gosling, P Harris, J Humpherson, I Whitmore and P Willan; ISBN 9780723438274 Elsevier, 2016.

**Fitzgerald's Clinical Neuroanatomy and Neuroscience**, 7th Edition, Elsevier, 2015.

### Recommended textbooks

**Gray's Anatomy. The Anatomical Basis of Clinical Practice**; 41st edition by S. Standring: 2015 ISBN : 9780702052309

**Netter's Clinical Anatomy with Online Access, 3rd Edition**, by J. Hansen, 2014, **eBook ISBN: 9781455770632 eBook ISBN: 9780323312899 014**

**Anatomy, A Photographic Atlas**, 8th Edition by Rohen, Yokochi; Wolters Kluwer, 2016, ISBN: 978-1-4963-0870-2

**Bräuer: Sobotta Flashcards** (Muscles; Bones, Ligaments, and Joints) URBF, 2013.

**KL Moore–AF Dalley: Clinically Oriented Anatomy**. 4th ed. Lippincott William and Wilkins, 1999.

**RMH McMinn: Last's Anatomy, Regional and Applied**. Churchill Livingstone, Edinburgh 1990. ISBN 0-443-03484-4

**Regional Anatomy**, by T Tömböl, Medicina 2008, ISBN 963 242 186 8

**Sectional Anatomy – Workbook**, by A. Nemeskéri; István Apáthy's Foundation, 2001.

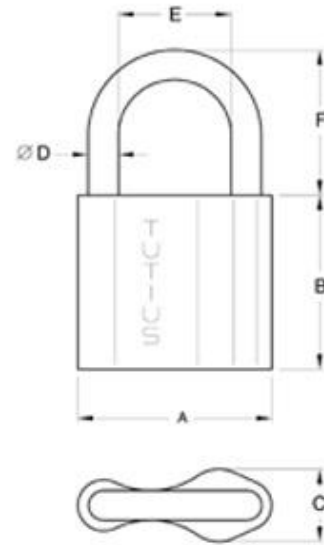
**Neuroanatomy An Illustrated Colour Text**, 4th Edition by Crossman & Neary Publication Date: 13/04/2010 ISBN-13: 9780702030864

**Functional Anatomy Anatomy, Histology and Embryology for medical and dental students** by M. Réthelyi and J. Szentágothai, Medicina, 2018.

**During dissection classes keep your belongings in the lockers and lock them with your padlock!**

**PADLOCK SIZE: 6 mm**

Please, remember to keep your valuables always on you since the department takes no responsibility for lost items.



## DISSECTION ROOM TOOLS

### SCALPEL



OR



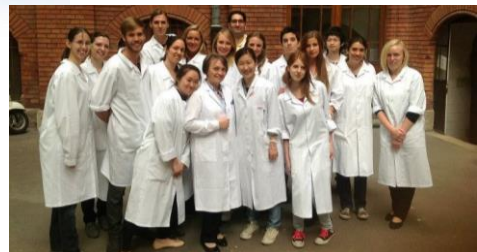
### A PAIR OF ANATOMICAL FORCEPS

### RUBBER GLOVES



### PROTECTIVE CLOTHING (LABCOAT)

### GOGGLES



# TOPICS OF THE SEMIFINAL EXAMINATION

## Macroscopic Anatomy I.

### *Musculoskeletal Anatomy*

General osteology, classification of bones

Continuous connections of bones. Classification of joints; components, movements and mechanisms

General myology

Structure of the vertebral column, the gross anatomy of the muscles acting upon it

Movements and muscles of the head&neck (atlantooccipital and atlantoaxial joints)

Joints of the shoulder girdle, the gross anatomy of the muscles acting upon them

Shoulder joint, the gross anatomy of the muscles acting upon it

Axillary fossa, quadrangular and triangular spaces

Muscle compartments and cross section of the arm

Elbow joint, the gross anatomy of the muscles acting upon it. Cubital fossa

Muscles and cross section of the forearm

Structure and movements of the radiocarpal joint, gross anatomy of the muscles acting upon it

Osteofibrous spaces and muscle compartments of the hand, tendinous sheaths

Carpometacarpal, metacarpophalangeal and interphalangeal joints of the thumb and fingers, the gross anatomy of the muscles concerned with the movements

Osteofibrous structure of the thoracic cage (bones, joints, ligaments, movements)

Thoracic muscles

Diaphragm

Muscles and spaces of the abdominal wall, rectus sheath

Composition of the pelvis (bones, ligaments and membranes)

Muscles of the buttock, the posterior abdominal wall and the pelvis (external and internal muscles of the hip)

Inguinal canal, femoral canal

Subinguinal hiatus, vascular and muscular compartments; adductor canal, femoral canal

Hip joint and the gross anatomy of the muscles concerned with the movements

Osteofibrous compartments, muscles and cross section of the thigh

Knee joint and the gross anatomy of the muscles concerned with the movements. Popliteal fossa

Osteofibrous compartments, muscles and the cross section of the leg

Ankle joint together with the gross anatomy of the muscles acting upon it

Subtalar and talocalcaneonavicular joints, the muscles acting upon them

Osteofibrous compartments and structure of the foot, arches of the foot

Bones, spaces and connections of the skull, external and internal skull bases

Neurocranium, components and cavities (anterior, middle and posterior cranial fossae)

Viscerocranium, components and cavities (walls and connections of the nasal cavity, orbit, oral cavity, pterygopalatine and infratemporal fossae)

Temporomandibular joint and the gross anatomy of the muscles of mastication

Superficial muscles of the neck, muscle triangles

Deep muscles of the neck and the laminae of the cervical fascia

Muscles of facial expression

### ***Internal organs of the head & neck region***

Oral cavity (divisions, boundaries)  
Floor of mouth, sulcus lateralis linguae  
Macroscopy of the tongue  
Types and morphology of teeth, blood supply and innervation  
Salivary glands together with topography  
Faucial isthmus, palate. Tonsils  
Pharynx and parapharyngeal spaces  
Blood supply and innervation of pharynx  
Pharyngeal muscles  
Nose, nasal cavity (boundaries, nasal meatus, vessels)  
Paranasal sinuses (connections, vessels)  
Larynx (shape, position, muscles, vessels, nerves)  
Skeleton and joints of larynx together with the fibroelastic membranes, mucous membrane  
Common and external carotid arteries and their branches. Maxillary artery and its branches  
Venous drainage of face and neck  
Lymph nodes and lymphatic vessels of the head&neck  
Axillary artery and branches. Arteries and veins of the arm, forearm, and hand  
Arteries and veins of the lower limb  
Lymph nodes and lymphatic drainage of the upper and lower limbs

### ***Further topics with relevance to the musculoskeletal system***

Lymphatic drainage of the thoracic wall including the mamma  
Dorsal branches of the spinal nerves, intercostal nerves  
Cervical plexus, brachial plexus, lumbar plexus, sacral plexus.  
Innervation of limbs  
Innervation of the trunk  
Cutaneous innervation