



**UNSW**  
A U S T R A L I A

Faculty of Medicine  
**SCHOOL OF MEDICAL SCIENCES**



**ANAT3141**

**FUNCTIONAL ANATOMY OF THE LIMBS**

**SESSION 1: 2014**



ANAT3141 FUNCTIONAL ANATOMY FOR HEALTH AND EXERCISE SCIENCE

**COURSE PACK**

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**Units of Credit**

This course is worth six units of credit (6 UOC).

**Hours per week**

This course entails 6 hours per week comprising two hours of lectures, two hours of laboratory practical, one hour tutorial/workshop, and one hour online tutorial.

**What is Anatomy?**

Anatomy is derived from the Greek words '*ana*' (meaning to *separate, apart from*), and '*temnein*' (meaning to *cut up, cut open*). Anatomy, therefore, is the study of body structure or morphology. Anatomy is one of the earliest of the medical sciences and has a colourful and prestigious recorded history that spans some 4000 years, with the earliest documents found in Egypt (the Edwin Smith Papyrus, dated 1600BC). Many of the earliest known medical scientists and physicians were devoted to understanding anatomy including the Greek physician Hippocrates (460-377BC) who first discovered the tricuspid valve of the heart. This was around the same time that cadavers were first used in anatomical research by Herophilos and Erasistratus in Alexandria, Egypt (4BC) and when the Sushruta Samhita, an Ayurvedic medical text including detailed anatomy descriptions was compiled in India. But by far the most notable of the early anatomists is Galen (2AD) who also compiled much of the anatomical knowledge known to date into what is probably **the** first anatomy textbook that reigned unchallenged for almost 1500 years - most of this text was destroyed during the Dark Ages. Anatomy really flourished around the 17<sup>th</sup> and 18<sup>th</sup> centuries largely due to the invention of the printing press that facilitated the exchange of ideas. Because anatomy was based on observations and drawings, the best anatomists were usually excellent artists (*au fait* with Latin) who attended dissections and published their drawings for money – these included, Michaelangelo, Rembrandt and Da Vinci.

Today, anatomy is the bedrock of medicine and of an array of allied health disciplines. Anatomical research today is diverse and focuses on understanding anatomical function from that of a single cell to through to the inter-relation of systems and function, biomechanics and movement, and embryology and development. This is done via techniques in cell and molecular biology, dissection as well as the use of clinical and radiological techniques.

The privilege of studying from cadaveric specimens is the cornerstone of this course and will provide you with an appreciate the anatomy of the musculoskeletal system and its adaption to function.

## Course Aims

This course covers the musculoskeletal anatomy of the **Limbs** focusing on its function and role in movement. The course includes a study of the functional aspects of muscles and joints, and consideration of the mechanical properties of tissues. Laboratory classes involve study of prosected specimens, radiography images and surface anatomy.

### *The course aims to:*

- provide students with a knowledge of the musculoskeletal anatomy of the upper limb and lower limb, and the back.
- develop students' understanding of the functional principles underlying joint movements and muscle actions of the upper limb and lower limb, and the back.
- develop students' understanding of the ways in which the structure and function of muscle and joints relates to human movement and biomechanics.

## Student learning outcomes

The course focuses on the organisation and structure of the musculoskeletal system that underpins function especially in movement. Student engagement particularly through the anatomy practicals will equip them to be able to identify the anatomical features of each of the joints and their related muscles studied on dissected human specimens, bones and models, as well as apply these to discussions of functional and applied aspects of the musculoskeletal system.

### *At the end of the course, the student should:*

1. better understand the functional anatomy of the upper limb and lower limb
2. know the anatomical features the skeletal elements of the upper limb and lower limb
3. know the structural features of each of the joints of the upper limb and lower limb
4. know the factors that contribute to stability and/or dislocations, and limit movement of each of the joints of the upper limb and lower limb
5. know the anatomical features and actions of the muscles that function to move the upper limb and lower limb
6. know the organization of the major limb nerve plexuses
7. know the peripheral nerves that innervate the muscles of the upper limb and lower limb.
8. know the major vessels (arteries, veins and lymphatic channels) that supply/drain the limbs.
9. apply anatomical knowledge in evaluating movement of the limbs , and in understanding the effect of peripheral nerve lesions
10. apply anatomical knowledge to the understanding of muscle testing
11. appreciate the link between functional anatomy and biomechanics
12. know the surface anatomy related to the structures of the upper limb and lower limb
13. demonstrate practical laboratory skills in anatomy and an understanding of the ethics of working with human remains

In addition to these, the University of New South Wales (UNSW) has developed a list of attributes that its graduates should possess upon graduation – these are referred to as the ‘**Graduate Attributes**’. *‘Graduate attributes are the qualities, skills and understandings a university community agrees its students should develop during their time with the institution. These attributes include, but go beyond, the disciplinary expertise or technical knowledge that has traditionally formed the core of most university courses. They are qualities that also prepare graduates as agents for social good in an unknown future’* (Bowden et al., 2000). These generic graduate attributes for UNSW can be found at: <https://my.unsw.edu.au/student/atoz/GraduateAttributes.html>

In addition to these, the **graduate attributes for Science students** are:

- **Research, inquiry and analytical thinking abilities.** Technical competence and discipline specific knowledge. Ability to construct new concepts or create new understanding through the process of critical analysis, problem solving, research and inquiry.
- **Capability and motivation for intellectual development.** Capacity for creativity, critical evaluation and entrepreneurship. Ability to take responsibility for and demonstrate commitment to their own learning, motivated by curiosity and an appreciation of the value of learning.
- **Ethical, Social and Professional Understanding.** Ability to critically reflect upon broad ethical principles and codes of conduct in order to behave consistently with a personal respect and commitment to ethical practice and social responsibility. Understanding of responsibility to contribute to the community. Respect and value social, multicultural, cultural and personal diversity.
- **Communication.** Effective and appropriate communication in both professional (intra and inter disciplinary) and social (local and international) contexts.
- **Teamwork, collaborative and management skills.** Ability to recognise opportunities and contribute positively to collaborative scientific research, and to perceive the potential value of ideas towards practical applications. Demonstrate a capacity for self management, teamwork, leadership and decision making based on open-mindedness, objectivity and reasoned analysis in order to achieve common goals and further the learning of themselves and others.
- **Information literacy.** Ability to make appropriate and effective use of information and information technology relevant to their discipline.

### **How the course relates to other courses**

ANAT3141, *Functional Anatomy of the Limbs*, covers the musculoskeletal anatomy of the limbs, and directly relates to and complements the 2<sup>nd</sup> semester course Level III course, *Functional Anatomy of the Head, Neck and Trunk* (ANAT3131). These courses build on the Level II anatomy course offerings: *Anatomy for Medical Science* (ANAT1521), *Histology: Basic and Systematic* (ANAT2241) and *Embryology: Early and Systematic Development* (ANAT2341) and complements the other level III anatomy courses: *Visceral Anatomy* (ANAT3121) and *Neuroanatomy* (ANAT3411). More generally, anatomy courses complement the subjects offered by other areas within the School of Medical Science (i.e.

Physiology, Pharmacology, Pathology and Health and Exercise Science) as well as courses taught in biological science, biomolecular science and genetics, psychology, biomechanics, vision science, food science and nutrition, medical microbiology and immunology, and engineering.

### Teaching rationale and strategies

Student interaction and engagement with the content of the course underpins all learning activities. Students are initially introduced anatomical region in the form of lectures incorporating multimedia-learning tools. With this knowledge in hand, students engage in learning activities during the laboratory sessions where the teacher/tutor guides the student and encourages each student to actively participate in their learning. Students are always encouraged to question, observe and share knowledge and experiences that help their learning and that of their peers. The anatomy laboratory is a wonderful and fascinating environment for discovery and students are given every opportunity to explore cadaveric specimens, participate in active discussions and find answers for themselves.

The teaching sessions are in the table below:

Lectures		Practicals
Monday	Wednesday	Wednesday
12-1pm	9-10am	10am-12pm/3-5pm

**Lectures** – This approach is used to present relatively large amounts of information within a given time on specific topics throughout the course. Lecture notes will be available online (see below in COURSE RESOURCES section) prior to or after each lecture, so you should be able to think about and develop an understanding of the lecture concepts as they are presented, rather than writing voluminous notes. However, there will be information and explanations presented in lectures in addition to those covered in the notes that you should take down if they help you to understand the material. The lecturer will also try to allow some time for interaction and activities in each lecture to provide you with an opportunity to clarify or reinforce the ideas that have been presented. You should take these opportunities to think about the information that has been presented and ask questions to enhance your understanding.

**Laboratory practical sessions** – The purpose of the practical sessions is to give students first hand experience of the content covered. The anatomy laboratory is the best resource to learning anatomy and is a wonderful place of privilege, discovery and discussion. The laboratory sessions are small group sessions that allow students to explore prosected specimens of the musculoskeletal system. Although, the tutor is present to guide you through the activities in these sessions, these sessions are meant to be lead by students working in groups of 3-4.

**Tutorials** – These sessions are designed for you to apply the concepts that you have learnt in the course. In these sessions, you will work in small groups of about 5 students each. You will be presented with discussion questions based on case studies or movement analysis images, and you will work in these groups to find solutions to these. Alternatively, you maybe required to complete activities using the Virtual Anatomy Adaptive Tutorial.

**Virtual Anatomy Adaptive Tutorials (VAnAT)** – The VAnAT will be made available to students periodically via a link in BlackBoard during this course. These are virtual tutorials based on high quality images of prosected specimens. The tutorials are a series of interactive questions based on applying the content covered in lectures and laboratory sessions, and are a useful resource in consolidating and revised course content. Sessions are structured to encourage student participation

in these activities and to enhance your learning. You will benefit most if you do these tutorials consistently. Some of these tutorials will also be done during allocated time within the course timetable. The focus of these tutorials will be to apply the principles of functional anatomy of the limbs and back.

**Independent study** – There is insufficient time in the lectures, tutorials and practicals for you to develop a deep understanding of the concepts covered in this course. In order for you to achieve the learning outcomes that will be assessed, you will need to revise the material presented in the course regularly. You will probably also need to do additional reading beyond the lecture materials in order to learn effectively. Relevant additional resources, including textbook chapters, will be cited in lecture and practical sessions.

**Assessments** – These tasks have been chosen as tools to enhance and guide your learning as well as a way of measuring performance, and are therefore a central teaching strategy in this course.

## Attendance

It is strongly recommended that students attend all lectures as they provide the basis for the laboratory classes. Attendance at practical classes is compulsory for completion of this course. The University's 80% attendance rule will be applied for this course. Please read these rules for attendance at the following URL: <https://my.unsw.edu.au/student/atoz/AttendanceAbsence.html>

Students should consult the following document for guidelines regarding extra-curricular activities: <http://medalsciences.med.unsw.edu.au/sites/soms.cms.med.unsw.edu.au/files/Extra-curricularActivitiesSOMS.pdf>

## Book list

You will need a textbook **AND** an atlas of human anatomy for this course

### Recommended text

1. Moore K.L., Dalley A.F. & Agur A. M. R., (2010) Clinically Oriented Anatomy. Lippincott Williams & Wilkins

OR

Drake, R.L., Vogl, W. & Mitchell, A.W.M. (2009). *Gray's anatomy for students*. (2<sup>nd</sup> ed.). Philadelphia ; London : Elsevier/Churchill Livingstone.

(Available online through the library or via the course Blackboard site

[http://er.library.unsw.edu.au/er/cgi-](http://er.library.unsw.edu.au/er/cgi-bin/eraccess.cgi?url=http://www.mdconsult.com/books/about.do?about=true&eid=4-u1.0-B978-0-443-06952-9..X0001-X--TOP&isbn=978-0-443-06952-9&uniqId=343683729-2)

[bin/eraccess.cgi?url=http://www.mdconsult.com/books/about.do?about=true&eid=4-u1.0-B978-0-443-06952-9..X0001-X--TOP&isbn=978-0-443-06952-9&uniqId=343683729-2\)](http://er.library.unsw.edu.au/er/cgi-bin/eraccess.cgi?url=http://www.mdconsult.com/books/about.do?about=true&eid=4-u1.0-B978-0-443-06952-9..X0001-X--TOP&isbn=978-0-443-06952-9&uniqId=343683729-2)

### Recommended Atlas

2. Tank P.W. and Gest T.R. (2009) Atlas of Anatomy. Lippincott, Wilkins and Williams (note: This comes as a bundle with Clinically Oriented Anatomy from the UNSW bookshop)

OR

Abrahams, PH, Spratt, JD, Loukas M, and van Schoor A-N (2013) McMinn's & Abrahams' Clinical Atlas of Human Anatomy . Elsevier Health

### Other useful textbooks are:

3. Hamill, J. & Knutzen, K.M.(2009). Biomechanical Basis of Human Movement, 3rd Edition, Lippincott, Williams & Wilkins. ISBN: 0781734053 (Library call no. 612.76/177)

## Official communication by email

All students in this course are advised that email is the official means by which the School of Medical Sciences at UNSW will communicate with you. All email messages will be sent to your official UNSW email address and, if you do not wish to use the University email system, you **MUST** arrange for your official mail to be forwarded to your chosen address. The University recommends that you check your email at least every other day. Facilities for checking email are available in the School of Medical Sciences and in the University Library.

## Assessment

Practical Quizzes	10%
Team Assignment	10%
Adaptive Tutorials	10%
Practical tests (mid-semester and end-of-semester)	35%
Final Theory exam	35 %

## Continuous assessment

In these assessments, you will need to:

- demonstrate a thorough knowledge of the functional anatomy of the limbs and back
- analyse and evaluate the involvement of muscles in movement.
- demonstrate and understanding of the link between functional anatomy and biomechanics
- demonstrate practical laboratory skills in anatomy and an understanding of the ethics of working with human remains questions.

Continuous assessments are usually in the form of short tests consisting of multiple choice question (MCQ) randomly given at the beginning of practical sessions, and in the form of Virtual Adaptive Anatomy Tutorials (VAnATs) that are completed online.

## Spot test

In addition to the above, spot tests assess your ability to identify and correctly name significant structures in prosected human specimens, models and radiographs. In addition it also examines the ability to answer relevant short theory questions.

In a spot test, students will usually have 3 minutes at each of 10 stations (rest spots maybe included, if necessary) to identify 4-5 labeled structures on the specimen and answer questions related to these structures (each station is worth 10 marks). Theory questions may be included at some stations as well.

Spot test 1 will cover lectures and practical sessions up to and including week 6.

Spot test 2 will cover lectures and practical sessions from week 7-13, inclusive.

## Theory examination

The purpose of this exam is to test your understanding of the concepts covered in the ENTIRE COURSE and to assess deeper learning (i.e. the ability to inter-relate information and concepts) and critical thinking. This is one 2-hour paper written during the formal Semester 1 examination period. The final examination will consist of multiple choice questions and short answer questions. The exam will be held during the end-of-session exam period. The outcomes for this assessment are as for those above.

### Team based learning and assignment

During the first week of the course you will be divided into 4 practical/tutorial groups and each group will be further subdivided into teams of 4-5 students each. Each team will have a mixture of abilities and backgrounds. The use of team-based learning is designed to improve your learning experience through peer-teaching in an interactive discussion facilitated by a tutor. Students will work in teams for each practical session.

You will receive your group and team allocations by week 2. These teams will also work together in the practical sessions and also for the team assignment.

To complete the team assignment task:

- Teams will be assigned a topic in week 2 and should
  - Research the topic and understand the topic well
  - Understand the underlying anatomy
  - Produce at the beginning of Week 9 ( 4 May 2014):
    - a 10 minute movie that explains the topic and the underlying anatomy concisely
    - a profile of your team interactions, meetings and member roles
    - an individual 500 word reflection on the team development and task, and your learning
  - Teams will be assigned two movie submissions to peer review (Week 9 and 10)
  - Team members will complete individual and team member reviews (Week 11)
  
- Marks will be deducted for submissions that are submitted after the deadline (**Monday, 4 May at 10am**).

### Supplementary Examinations

It is intended that supplementary exams for the School of Medical Sciences in Semester 1, 2014 will be held either the **morning or afternoon of 15-17 July 2014**. If you are eligible for these, you will be notified of the exact date and time as soon as possible after final exam marks have been finalized. Please note, supplementary and deferred examinations may have a significant oral component.

### Feedback

This is a challenging course. The course convener will endeavour to make this course interesting, relevant and a rewarding learning experience for you. Problem based questions have been included at the end of each practical in your course manuals – you are encouraged to work through these to provide yourself with feedback on your progress through the course. During the practical sessions, you will also have an opportunity to try some practice spot-test-style questions. Answers for these will be provided as feedback to you on your progress. The continuous assessment MCQ is designed to give you continuous feedback on your progress. Answers to these will also be discussed immediately following the assessment. In addition, the virtual adaptive anatomy tutorials will be made available via a link in Blackboard. These will provide you with immediate feedback and are to be used as a formative assessment tool.

## Plagiarism

The School of Medical Sciences will not tolerate plagiarism in submitted written work. Students should be aware of UNSW's policy on academic and student misconduct:

[http://www.student.unsw.edu.au/academiclife/assessment/academic\\_misconduct.html](http://www.student.unsw.edu.au/academiclife/assessment/academic_misconduct.html).

Evidence of plagiarism in submitted assignments, etc. will be thoroughly investigated and may be penalised by the award of a score of zero for the assessable work. Flagrant plagiarism will be directly referred to the Division of the Registrar for disciplinary action under UNSW rules.

The attention of students is drawn to the following extract from the above website:

“The basic principles are that you should not attempt to pass off the work of another person as your own, and it should be possible for a reader to check the information and ideas that you have used by going to the original source material. Acknowledgment should be sufficiently accurate to enable the source to be located speedily.”

The following are some examples of breaches of these principles:

- a. Quotation without the use of quotation marks. It is a serious breach of these rules to quote another's work without using quotation marks, even if one then refers to the quoted source. The fact that it is quoted must be acknowledged in your work.
- b. Significant paraphrasing, e.g., several sentences, or one very important sentence, which in wording are very similar to the source. This applies even if the source is mentioned, unless there is also due acknowledgment of the fact that the source has been paraphrased.
- c. Unacknowledged use of information or ideas, unless such information or ideas are commonplace.
- d. Citing sources (e.g., texts) which you have not read, without acknowledging the 'secondary' source from which knowledge of them has been obtained.”
- e. Appropriate citation of sources therefore includes surrounding any directly quoted text with quotation marks, with block indentation for larger segments of directly quoted text. The preferred format for citation of references is an author-date format with an alphabetically arranged bibliography at the end of the assignment. Note that merely citing textbooks or website URLs is unlikely to yield a bibliography of satisfactory standard. The Internet should be avoided as a primary source of information. Inclusion of appropriate journal articles, both primary research publications and reviews, is usually expected.

## Student equity and diversity issues

Students requiring assistance are encouraged to discuss their needs with the Course Authority prior to, or at the commencement of the course, or with the Equity Officer (Disability) in the Equity and Diversity Unit (EADU) (9385 4734). Further information for students with disabilities is available at

<http://www.studentequity.unsw.edu.au/disabil.html>

The course authority must be informed at the beginning of the course of any special consideration and circumstances esp. with regard to laboratory practical sessions and/or assessments.

## Applications for Special Consideration

Students who miss an assessment due to illness or misadventure must submit an application for special consideration within 3 working days of the event to Student Central. Special considerations sought outside the 3 day time period WILL NOT be accepted except in TRULY exceptional circumstances.

Full details of application and the required documentation may be found at <https://my.unsw.edu.au/student/atoz/SpecialConsideration.html>

Note that normally, if you miss an exam (without medical reasons) you will be given an absent fail. If you arrive late for an exam no time will be granted. It is your responsibility to check timetables and ensure that you arrive on time.

Students who apply for consideration to Student Central must also notify the Course Authority immediately.

**Applications for special consideration are accepted in the following circumstances only:**

1. Where academic work has been hampered to a substantial degree by illness or other cause. Except in unusual circumstances a problem involving only three consecutive days or a total of five days within the teaching period of a semester is not considered sufficient grounds for an application.
2. The circumstances have to be unexpected and beyond your control. Students are expected to give priority to their University study commitments and any absence must clearly be for circumstances beyond your control. Work commitments are not normally considered a justification.
3. An absence from an examination must be supported by a medical certificate or other document which clearly indicates you were unable to be present. A student absent from an examination or who attends an examination and wants to request special consideration is normally required to provide a medical certificate dated the same day as the examination.
4. An application for Special Consideration must be provided within three working days of the assessment to which it refers. In exceptional circumstances an application may be accepted outside the three-day limit.

**Please note: Students cannot claim consideration for conditions or circumstances that are the consequences of their actions or inactions.**

## **Grievance Officer**

If you have any problems with the course you should, in the first instance, consult the **Course Authority**. If you are unable to resolve the difficulty, you can consult the School's nominated **Grievance Resolution Officer** (Dr Priti Pandey, [p.pandey@unsw.edu.au](mailto:p.pandey@unsw.edu.au) ).

## **Resources for students**

### **Moodle**

Information about the course and a number of electronic study resources can be accessed via the UNSW Moodle learning management system. You can access the system from myunsw. Lecture notes, access to your grades, course documents (such as this document), and reference material can be found on the course Moodle site. Communicate with the tutors and your groups and teams can also be done via Moodle. Please see the course authority if you cannot access this course via Moodle.

### **Echo360**

Echo 360 provides digital audiovisual recordings of lectures that can be accessed via streaming media over the web or as a podcast. This can also be accessed via Moodle.

***Please note that this is not guaranteed as from time-to-time we expect (from past experience) that there will be some IT issues with these.***

### UNSW Library

The University Library provides a range of services to assist students in understanding how to identify what information is required for assignments and projects; how to find the right information to support academic activities; and how to use the right information most effectively. <http://www.library.unsw.edu.au>. All the Anatomy resources are listed on the Anatomy library Subject Guide at:

<http://subjectguides.library.unsw.edu.au/content.php?pid=8701&sid=56148>

The **Primal Pictures Anatomy** and the **Acland's Anatomy videos** database provided by UNSW library is an excellent resource for anatomy. Links to these will be provided on Moodle each week.

### Other useful resources are:

A CD of anatomy images can be purchased from SOMS administration office in the Wallace Wurth building for \$15. The CD contains images of some specimens and models used in the anatomy practicals.

### Revision Facilities

1. Anatomy Museum is located on the ground floor of the Wallace Wurth East. The museum contains a variety of bottled anatomical dissections. Please do not remove museum jars from shelves. The museum also contains computers loaded with Anatomy software and Internet access. Access to the museum is by swipe card and is restricted to only anatomy students, between 8.30 a.m. and 5.30 p.m. Monday to Friday. NO photography is allowed in the Anatomy Museum.
2. Rooms G16/G17 in Wallace Wurth East contain computers with a variety of anatomical software, and can be used to access the Virtual Adaptive Anatomy Tutorials (VAnATs). Access to this laboratory is by student swipe card only. Students may use them, provided **the rooms are not required for other classes**. Again these are accessible by swipe card only.

### Course evaluation and development

ANAT2451 Functional Anatomy for Health and Exercise Science was offered for the first time in 2012 as part of the Bachelor of Exercise Physiology. This new course has been tailored to meet the needs of the exercise physiology students by placing greater emphasis on functional anatomy. From the experience of the course authority and students feedback in 2012 and 2013, the following changes were made to this course:

- Virtual Adaptive Anatomy Tutorials (V-AnATs) have been incorporated formally into this course
- The continuous assessment for this course has been revised.

Student feedback is welcome and taken seriously. A Course and Teaching Evaluation and Improvement (CATEI) survey will be provided in the final weeks of the course to formally gather student feedback. The feedback received will be used to enhance the course for future.

There will also be opportunities for representatives from ANAT2451 to meet with the course convener at regular intervals during the course. This will provide you with an opportunity to discuss (via these reps) how the course is progressing and any issues that have arisen or difficulties in concepts etc. As CATEIs are usually at the end of the course, this student representative panel is an opportunity for issues to be addressed, corrected or amended while the course is still progressing so that it is rewarding and engaging to the current cohort of students.

### **Ethical behaviour and human remains**

A central form of learning in this course is to study prosected (i.e. professionally dissected) human anatomical specimens. These are prepared from the remains of people who have donated their bodies to UNSW so that you and your peers can study the human body. This is an extraordinary generous act of these donors and their families, and is a special and wonderful privilege. Treating these remains with the utmost care and great respect is mandatory and is our responsibility to these donors and their families – it is also a good ethical practice and is mandated by law.

### **A note of the preparation of anatomical material**

In the **gross anatomy** practicals, you will have the privilege of working with dissected human specimens, as well as dried bones, models and radiological images. These dissections are obtained from cadavers, which have been generously bequeathed (donated) to the University, prior to death. As soon as possible after death, the body is brought to the University where it undergoes a process known as embalming, which involves flushing the blood out of the arterial system and then infusing it with a colourless preserving solution known as formalin. The specimens are then dissected to show specific anatomical features. Dissected specimens are stored in a preservative solution that does not contain formalin and when needed, is placed on tables for class use. In some cases, dissected specimens are impregnated with a curable polymer in a process known as plastination, which produces dry non-toxic specimens, which have the texture of firm plastic.

**NOTE REGARDING IMAGES IN THIS BOOK**

Please note (unless otherwise stated) all images used in this book are taken from the prescribed textbook

*Moore K.L., Dalley A.F. & Agur A. M. R., (2010) Clinically Oriented Anatomy. Lippincott Williams & Wilkins*

## Health and Safety Rules for Students in the Dissecting Room

*There are some rules that are enforced for the safety of the staff and students, while others are concerned with the need for care and respect of the prosection material.*

### General courtesy

- Students are required to attend **each lecture and the assigned tutorial/laboratory class** unless given special permission. Provision of an appropriate medical certificate to the course authority will be required for any Special Consideration.
- You may **enter** and **view** specimens in the Dissecting Room 101 **only** in the presence of your tutor and/or during your designated tutorial/laboratory class hours. You are **not permitted** to take visitors into the Dissection Room.

### Health and Safety Rules

*A detailed risk assessment for student activities in the Dissecting Room is located on the notice board at the front entrance (near 1<sup>st</sup> floor lifts).*

When in the Dissecting Room, you are required to:

- **always put on your laboratory coat** when you enter the lab. If you have forgotten to bring your lab coat, purchase a disposable coat from the ground floor in Wallace Wurth building or the Union shops on campus. Lab coats must not be worn in the hall or anywhere outside the laboratories.
- **wear covered shoes with enclosed heels**, never thongs or sandals.
- **wear latex or vinyl gloves** when touching wet specimens (gloves are available from the Union Shop near CLB theatres).
- **never eat or drink.**
- **never put anything in your mouth.** For example, pens or pencils that you may have picked up from the table.
- **avoid inhaling** preservative solutions for prolonged periods. If you feel in need of fresh air, ask permission to leave the laboratory for a few minutes.
- **report all accidents** or incidents immediately to a staff member for assessment without exception. Injuries involving sharps or needle-stick will require a blood test as soon as possible.

At the end of your laboratory class:

- **cover wet specimens** with the towels provided. Make sure that towels do not hang over the edge of the table, because this allows fluid to drip onto the floor. Fluids on the floor are a major safety hazard and should be reported to staff immediately.
- **replace stools** under the tables in your cubicle.
- **remove your gloves** and dispose in the biowaste bins provided.
- **wash your hands** and instruments thoroughly with the soap provided and dry your hands with the paper towel.
- **remove your laboratory coat** when you leave the dissecting room.

### Preservative solution

There are 3 main chemicals used as preservation fluids in the Dissecting Room:

**phenoxyethanol** (2% in solution); **methylated spirits** (10%) and **formalin** (5%)

The safety data sheets (SDSs) for these chemicals are located by the lab First Aid Kit and also on the notice board outside the lab. Women of reproductive years, and especially those who know they are pregnant, should note that all of these are suspected human reproductive and developmental toxins

and therefore may pose a hazard to the unborn child. In addition, formalin (**formaldehyde** solution) is a human carcinogen. Avoid these chemicals coming into contact with your eyes and skin and they should not be ingested.

Most anatomy specimens are stored in 2% phenoxyethanol, which is classified as relatively non-toxic. You should always wear gloves when handling specimens and must avoid ingestion of this chemical and contact with your skin or eyes. Formaldehyde is reported to cause allergic skin and respiratory effects. The potential for adverse health effects, however, is markedly reduced at the concentrations used for embalming and storage of specimens in the Dissecting Room, i.e., the “formalin” solution is less than 5% of a 37% solution of formaldehyde. The specimens provided for classes are without any formalin and a combination of air extraction and conditioning continuously changes the air in the Dissecting Room.

#### **First Aid**

If assistance is needed during office hours you may approach **Room 101** staff for **First Aid**. **All incidents must be reported**. The First Aid Kit is located on the left wall near the Dissecting Room entrance door. A second First Aid Kit is located in the east wing on the ledge opposite cubicle E4.

#### **Emergency evacuation**

In the case of a fire or other emergency the evacuation alarm will sound. When it sounds for the first time this indicates that everyone should get prepared in case it is necessary to evacuate. When it sounds for the second time, an announcement will be made over the speaker system - **follow these instructions**. Staff will be on hand to supervise any evacuation, and the emergency exit is at the south end of the lab. **Do not use the lifts**. The evacuation assembly area is the landscaped space immediately to the east of the Chancellery and adjacent to the Clancy Auditorium. **Do not assemble anywhere else** and do not leave this area until instructed.

#### **Additional Safety Information**

If additional safety information is required you can ask the course convenor or the Anatomy Dissection Laboratory Manager (Mr Vincent Strack). The latest safety information is always available from the SOMS HS Webpage.

<http://medalsciences.med.unsw.edu.au/SOMSWeb.nsf/page/Health+and+Safety>

#### **Care and respect of prosected material**

You are learning from human material prepared from people who have generously donated their bodies for the benefit of science. Skilled staff members have dissected the specimens to allow you, the student, to see anatomical structures in fine detail. Apart from caring for the specimens, it is important for all students learning Anatomy to have and show **utmost respect** for the specimens at all times, in the Dissecting Room, Room 101, and in the Anatomy Museum Room 105. **Great care** should always be exercised when handling specimens, in order to preserve their delicate structure.

#### **Some specific points:**

- **Always use only blunt forceps** to handle specimens and **probes** to point to structures, i.e. **never pull** at any parts of the specimen.
- It is **illegal** for any anatomical material to be removed from the premises of the Department of Anatomy for any purpose whatsoever (except of course, for the funeral). All anatomy specimens are micro-chipped for identification and record keeping.
- Photography and video recording are **not permitted** in the Dissecting Room 101, or the Anatomy Museum 105.

<b>ANATOMY Teaching Laboratory</b>  <b>Student Risk Assessment</b>	 <b>UNSW</b> <small>THE UNIVERSITY OF NEW SOUTH WALES</small>	<p style="text-align: right;"><b>Gross Anatomy Practical Classes for ANAT2451 Students</b></p> <p style="text-align: right; font-size: small;">DOC:PHSL-SRA-S&amp;H-01rev1.1</p>
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Hazards	Risks	Control
Physical Cold temperature (16°C) Sharp bone/plastic  Biological Fungi, bacteria (tetanus), hepatitis B and C  Chemical Formaldehyde Methanol 2-phenoxyethanol	Cold Penetrating wound of foot  Infection  Corrosive/Flammable Irritant/toxic Irritant	<ul style="list-style-type: none"> <li>Wear laboratory coat over appropriate warm clothing</li> <li>Wear enclosed shoes with full coverage of the dorsum of the foot</li> <li>Do not eat, drink or smoke in the Dissecting Room</li> <li>Do not place anything (e.g. pens, pencils) into your mouth</li> <li>Use disposable gloves when handling wet specimens and do not cross-contaminate models or bones with wet specimens</li> <li>Always wash hands with liquid soap and dry thoroughly with disposable paper towel before leaving</li> <li>Low concentrations of chemicals used</li> <li>Chemicals used in well ventilated area</li> <li>Safety Data Sheets for chemicals available in the laboratory</li> </ul>

Personal Protective Equipment required			
 <div style="background-color: #0056b3; color: white; padding: 2px; font-size: small;">Closed in Footwear</div>	 <div style="background-color: #0056b3; color: white; padding: 2px; font-size: small;">Lab. Coat</div>	 <div style="background-color: #0056b3; color: white; padding: 2px; font-size: small;">Gloves</div>	

**Emergency Procedures**  
 In the event of an alarm sounding, stop the practical class and wait for confirmation to evacuate from demonstrators. Then wash your hands and pack up your bags. Follow the instructions of the demonstrators regarding exits and assembly points.

**Clean up and waste disposal**

- Cover wet specimens with the towels provided. Make sure that towels do not hang over the edge of the table, because this allows fluid to drip onto the floor. Fluids on the floor are a major safety hazard and should be reported to staff immediately.
- Replace stools under the tables in your cubicle.
- Remove your gloves and dispose in the biowaste bins provided.
- Wash your hands and instruments thoroughly with the soap provided and dry your hands with the paper towel.
- Remove your laboratory coat when you leave the dissecting room.

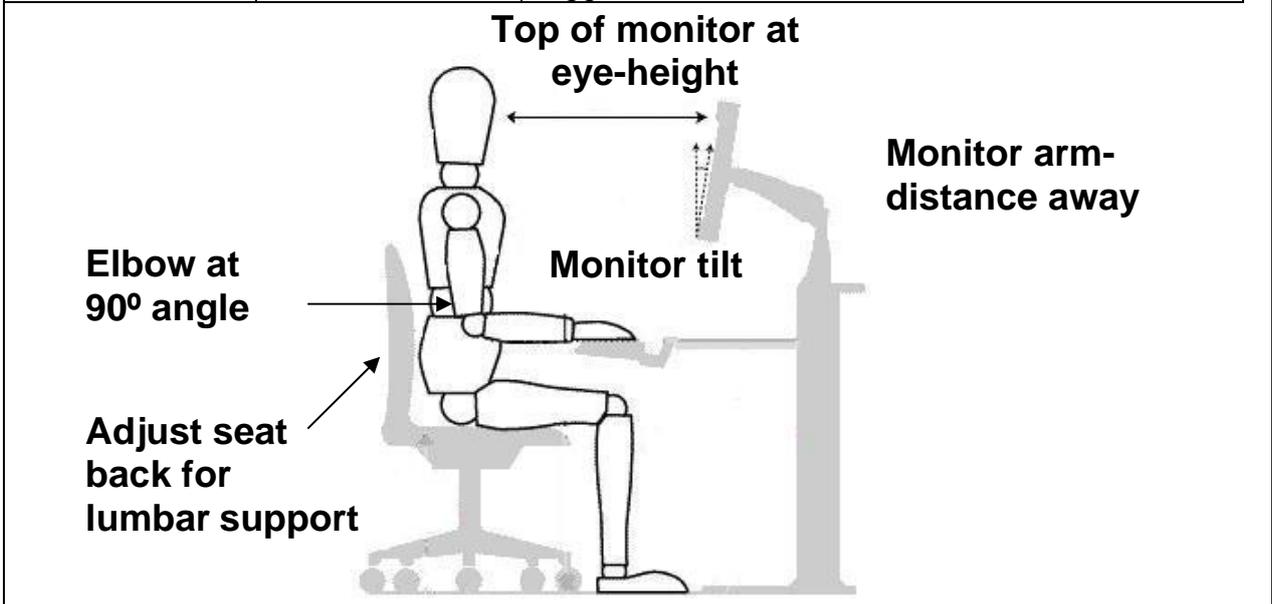
**Ethics Approval**  
 This type of practical has been previously considered and approved by the UNSW Human Research Ethics Advisory Panel (**HREC09372**).

**Declaration**  
 I have read and understand the safety requirements for this practical class and I will observe these requirements.

Signature:.....Date:.....

<p>Anatomy Teaching Laboratory</p> <p>Student Risk Assessment</p>		<p>Anatomy Tutorial classes for ANAT2451 Students (G2/G4)</p>
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Workstation set-up		
Ergonomics	Musculoskeletal pain.	Correct workstation set-up.
Electrical	Electrical shock/fire	Check electrical equipment in good condition before use. All portable electrical equipment tested and tagged.



Personal Protective Equipment
Not necessary in these practicals.

Emergency Procedures
<p>In the event of an alarm, follow the instructions of the demonstrator. The initial sound is advising you to prepare for evacuation and during this time start packing up your things. The second sound gives instruction to leave. The Wallace Wurth assembly point is the lawn in front of the Chancellery. In the event of an injury, inform the demonstrator. First aiders and contact details are on display by the lifts. There is a first aid kit in the laboratory and the Wallace Wurth security office.</p>

Clean up and waste disposal
No apparatus or chemicals used in these practicals.

Declaration
<p>I have read and understand the safety requirements for these practical classes and I will observe these requirements.</p> <p>Signature:.....Date:.....</p> <p>Student Number:.....</p>

WEEK	Date	LECTURES		PRACTICAL
		Mon 12-1pm Biomed C	Wed 9am-10am Biomed D	Wednesday 10-12pm, 12-2pm or 3-5pm WW101E
<b>1</b>	3-9 Mar	Shoulder girdle and joints	Pectoral and scapular regions	Lab1: Pectoral girdle and shoulder joint
<b>2</b>	10-16 Mar	Axilla and brachial plexus	Arm and elbow joint	Lab2: Axilla, Arm and elbow joint
<b>3</b>	17-23 Mar	Forearm	Radio-ulnar and wrist joints	Lab3: Forearm and radio-ulnar joints
<b>4</b>	24-30 Mar	Muscles of the hand	Blood supply to the upper limb	Lab4: Wrist and hand
<b>5</b>	31 Mar- 6 Apr	Upper limb nerve lesions I	Upper limb nerve lesions II	Lab5: Upper Limb nerves and vessels
<b>6</b>	07-13 Apr	<b>Revision: upper limb (Anatomy Lab, 12-2pm)</b>	Pelvic girdle and gluteal region	Lab6: Upper Limb Surface Anatomy & PBL activities
<b>7</b>	14-20 Apr	<b>SPOT 1</b>	Hip joint and posterior thigh	Lab7: Gluteal region and hip joint
<b>Mid-Semester break</b>				
<b>8</b>	28 Apr-4 may	Thigh – Anterior and medial, and femoral triangle	Knee joint and popliteal fossa	Lab8: Thigh and knee
<b>9</b>	5-11 May	Leg	Lumbosacral plexus	Lab9: Popliteal fossa and Leg
<b>10</b>	12-18 May	Ankle joint	Foot	Lab10: Ankle and foot
<b>11</b>	19-25 May	Blood supply of the lower limb	Lower limb nerves lesions I	Lab11: Lower Limb nerves and vessels
<b>12</b>	26 May- 1 Jun	Gait	Lower limb nerves lesions II, and exam overview	Lab12: Surface anatomy lower limbs & PBL activities
<b>13</b>	2-8 Jun	<b>Revision: lower limb (Anatomy Lab, 12-2pm)</b>	<b>SPOT 2</b>	

