



THE UNIVERSITY OF
BUCKINGHAM

MEDICAL SCHOOL

MB ChB

Unit Summary: Musculoskeletal System

1 *Educational Aims of the Unit*

The unit aims to enable students to make progress towards meeting some of the learning outcomes described in Tomorrow's Doctors (2009) relevant to 'The Doctor as a Scholar and Scientist' and 'the Doctor as a Professional'. The specific aim is to enable students to understand the structure and function of bones, joints and muscles, and blood supply and innervation of the upper limb, lower limb and vertebral column by using a variety of learning methods and resources including physical examination (surface and living anatomy). The module also aims to introduce students to relevant clinical conditions and disorders of these regions and help them to acquire a working knowledge and understanding of the principles and concepts applicable to the musculoskeletal system in general.

2 *Learning Outcomes From Tomorrow's Doctors (2009)*

Outcomes 1: The Doctor as a Scholar and Scientist.

8. The graduate will be able to apply to medical practice biomedical scientific principles.
 - a) Explain normal human structure and functions.
 - b) Explain the scientific bases for common disease presentations.
 - c) Justify the selection of appropriate investigations for common clinical cases.
 - d) Explain the fundamental principles underlying such investigative techniques.
 - g) Make accurate observations of clinical phenomena and appropriate critical analysis of clinical data.
12. Apply scientific method and approaches to medical research.
 - a) Critically appraise the results of relevant diagnostic, prognostic and treatment trials and other qualitative and quantitative studies as reported in the medical and scientific literature.
 - b) Formulate simple relevant research questions in biomedical science, psychosocial science or population science, and design appropriate studies or experiments to address the questions.
 - c) Apply findings from the literature to answer questions raised by specific clinical problems.

Outcomes 3: The Doctor as a Professional

20. The graduate will be able to behave according to ethical and legal principles. The graduate will be able to:
 - e) Recognise the rights and the equal value of all people and how opportunities for some people may be restricted by others' perceptions.
21. Reflect, learn and teach others.
 - b) Establish the foundations for lifelong learning and continuing professional development, including a professional development portfolio containing reflections, achievements and learning needs.
 - c) Continually and systematically reflect on practice and, whenever necessary, translate that reflection into action, using improvement techniques and audit appropriately for example, by critically appraising the prescribing of others.
 - d) Manage time and prioritise tasks, and work autonomously when necessary and appropriate.

e) Recognise own personal and professional limits and seek help from colleagues and supervisors when necessary.

3 Teaching and Learning Strategies

Principles will be introduced in formal lectures, and learning will be reinforced in practical classes and facilitator led small-group work immediately afterwards. Student will work in the same teams throughout Phase I to encourage team-working.

Some concepts will be discussed in more detail in tutorials, and Moodle- based tests and coursework will allow for formative assessment. Students will be provided with workbooks describing structured tasks to direct independent learning throughout the unit, and ongoing use of an e-portfolio will nurture and encourage reflective practice.

4 Unit Outline/Syllabus

Session 1:

Lecture: The Skeletal System – introduction to module, bones and joints

Tutorial: Anatomicomedical terminology

Small group work: 1. The pectoral region. 2. Osteology and radiology of upper limb

Session 2:

Lecture: Skeletal muscle: morphology and mechanics

Small group work: The axilla and brachial plexus

Lecture: Clinical overview of the musculoskeletal system

Session 3:

Lecture: Development of the limbs

Small group work: The front and back of the arm

Lecture: The shoulder joint and the back of the trunk

Session 4:

Lecture: Dermatomes and segmental innervation of the upper and lower limb

Small group work: The front and back of the forearm i

Formative assessment

Session 5:

Lecture: The elbow joint, joints of the forearm and wrist

Small group work: 1. The front and back of the forearm ii. 2. surface anatomy and case studies

Session 6:

Lecture: Clinical pathology of joints

Small group work: The hand

Lecture: Injuries of joints – dislocations, fractures and sprains

Session 7:

Lecture: The vertebral column and its common injuries

Small group work: 1. Osteology and radiology of the lower limb 2. The front and medial parts of the thigh

Session 8:

Lecture: The hip joint

Small group work: 1. The buttock and gluteal region 2. Introduction to nerve injuries of the upper limb

Session 9:

Lecture: The knee joint

Small group work: The back of the thigh, hamstring muscles and popliteal fossa

Lecture: Joint examination and imaging of the musculoskeletal system

Session 10:

Lecture: Common nerve injuries in upper and lower limbs

Small group work: 1. The front of the leg and dorsum of the foot 2. Case studies

Session 11:

Lecture: Clinical effects of ageing and dysfunction of the musculoskeletal system

Small group work: The back of the leg

Lecture: Major vessels of the lower limb

Session 12:

Lecture: The ankle joint and foot

Small group work: Mechanisms of walking

Lecture: Nerve injuries of the lower limb and gait abnormalities

Lecture: Clinical anatomy of the foot

5 Secondary Learning Outcomes

In addition to meeting the outcomes described in Tomorrow's Doctors, at the completion of the unit students will be able to:

- Outline the structural and mechanical functions of the skeleton and relate the forms of bones to their functions.
- Outline the structural and functional features of joints and describe the common causes of joint injuries (e.g. dislocation, fracture and sprain) and joint disorders/pathology (eg bursitis, osteoarthritis, rheumatoid arthritis).
- Outline skeletal muscle morphology and mode of muscle contraction, relaxation and fatigue in relation to sources of oxygen and energy requirements.
- Identify salient features of the bones of the pectoral and pelvic girdles, upper and lower limbs and vertebral column on the skeleton and on radiographs and outline common sites, causes and consequences of their fracture.
- Describe the structure, function and main movements of the joints of the upper limb, lower limb and vertebral column and their common injuries.
- Describe and demonstrate movement of the major muscle groups of the pectoral and pelvic girdles and upper and lower limbs.

- Describe the major nerves of the brachial, lumbar and sacral plexuses, their motor and sensory (including segmental) distribution and the consequences of injuries to them.
- Describe the principal arteries and veins of the upper and lower limbs, locate common sites of arterial pulses and venepuncture and outline the mechanisms of venous return from the lower limb.

6 Key Texts and/or Other Learning Materials

- **Clinical Medicine:** Kumar and Clarke 2012 8th Ed, Saunders
- **Anatomy:** *Gray's Anatomy for Students* 2009 2nd Ed, Churchill Livingstone
- **Biochemistry:** Denise R. Ferrier 2013 6th Ed, Lippincott Williams & Wilkins
- **Pathology:** *Underwood's pathology: a clinical approach* 2013 6th Ed, Churchill Livingstone
- **Physiology:** Robin R. Preston, Thad E. Wilson 2012 International Ed, Lippincott Williams & Wilkins
- **Clinical examination:** *Macleod's clinical examination* - John Macleod 2013 13th Ed, Churchill Livingstone Elsevier

Document Version Information

Document Title: Unit Summary: Musculoskeletal System

Originator:

Date:

Replacing Document:

Approved:

Date: