



THE UNIVERSITY OF
BUCKINGHAM

MEDICAL SCHOOL

MB ChB

Unit Summary: Respiratory 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', 'The Doctor as a Practitioner; and 'The Doctor as a Professional'. The specific aim is to enable students to develop an understanding of the structure and function of the respiratory system, how it is affected by common diseases, how its condition may be assessed and the basic principles of treatment of respiratory disorders.

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 2: The Doctor as a Practitioner

13. The graduate will carry out a consultation with a patient
 - a) Take and record a patient's medical history, including social and family history, talking to relatives where appropriate
 - c) Perform a full physical examination

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: Introduction to the Respiratory System

Lecture: Introduction to the Module

Lecture: Introduction to the respiratory system

Tutorial & Demonstration: The Upper respiratory tract

Lecture: Histology of the respiratory tract

Session 2: Ventilation of the Lungs

Lecture: Anatomy of the Respiratory System

Dissecting room: Thoracic cavity and intercostal spaces

Lecture: Ventilation of the lungs

Session 3: Mechanics of Breathing

Lecture: Mechanics of breathing

Group work: Lung mechanics

Lecture: Lung function testing

Session 4: Blood Gas Carriage

Lecture: Oxygen in blood

Group work: Oxygen in blood

Lecture: Carbon Dioxide in blood

Session 5: Control of Breathing, Hypoxia, Respiratory Failure, Asthma

Lecture: Chemical control of breathing

Group work: Control of breathing

Lecture: Hypoxia, Respiratory Failure

Lecture: Asthma

Session 6: COPD, Lower Respiratory Tract Infections & Pneumonia

Lecture: COPD

Group work: Case studies in Asthma & COPD

Lecture: Lower respiratory tract infections & Pneumonia

Session 7: Tuberculosis, Lung Cancer

Lecture: Tuberculosis

Group work: Case studies – Pneumonia & TB

Lecture: Lung Cancer

Session 8: Radiology of the Chest, Pleural and Chest Wall disease & Interstitial Lung Disease

Lecture: Radiology of the Chest

Group work: Lung Cancer case studies

Lecture: Interstitial lung disease

Session 9: History Taking & Examination of Respiratory System

Group work: Imaging of the chest

Lecture: History taking and Examination of the Respiratory System

Session 10: Consultation skills 1 - History Taking and Spirometry Practical

History Taking

Spirometry practical and Lecture

Work book problems

Session 11: Respiratory Failure and Overview of the Respiratory System

Consultation skills 2 - Examination and Spirometry Practical

Lecture: Respiratory Failure & overview

Examination

Spirometry practical

Work book problems

Session 12: Review

Lecture and group work: Review

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:

- Describe the structure and the respiratory function of the nose, the paranasal sinuses, pharynx and larynx and describe the connections between the nose, paranasal sinuses, pharynx, auditory tube & middle ear.
- Describe the structure of the pleural cavity and lines of pleural reflection, the lobes of the lung and their surface marking, structure and arrangement of airways and blood vessels in the lungs, and the histology of the lung airways.
- Describe the structure of a typical thoracic vertebra and rib, the relations and arrangement of muscles in the thoracic wall and diaphragm, and the function and distribution of the intercostal nerves, arteries and veins.
- Describe the mechanism of inspiration and expiration, the measurement of lung volume and capacities, and common tests of lung function.

- Describe the carriage of oxygen in the blood, explain the role of carbon dioxide in blood and its role in acid base balance, and describe the neural and chemical control of breathing, with particular reference to different types of respiratory failure.
- Describe the conditions of asthma, and chronic obstructive pulmonary disease; its presentation, diagnosis, cell biology, epidemiology and treatment with bronchodilators and other drugs.
- Describe the defences of the lung against infection, the immunology of the lung, and the microbiology of common lung infections.
- Describe the classification, microbiology and principles of diagnosis and treatment of pneumonias, and tuberculosis.
- Describe the definition and classification of interstitial lung disease, its relationship to occupational lung disease, its pathology and the principles of diagnosis and treatment.
- Describe the pathology of lung cancers, their classification, and the principles of their diagnosis and management.
- Describe common diseases of the pleura and chest wall.
- Describe the changes in various types of respiratory failure and explain their physiological consequences.
- Describe and be able to recognise the key features of a plain film radiograph of the chest, describe the features of and recognise uncomplicated lobar collapse, pneumothorax, consolidation, space occupying lesions in the lung and pleural effusion and estimate the cardiac index.

6 Key Texts and/or Other Learning Materials

- *Clinically Oriented Anatomy*, by K.L. Moore and A.F. Dalley.
- *Colour Atlas of Histology*, by L. P. Gartner and J. L. Hiatt.
- *Lippincott's Illustrated reviews: Physiology*, by R. Preston and T.E Wilson (Kluwer/Lippincott, Williams & Wilkins).
- *Gannon's Review of Medical Physiology*, by Barrett, Brooks, Boitano & Barman
- *Clinical Medicine*, by P. Kumar and M. Clarke.
- *Macleod's Clinical Examination*, by D. G. Nicol and C. Robertson.
- *Clinical Skills*, by N. Cox and T.A. Roper.
- *Pharmacology*, by H.P. Rang, M.M. Dale, J.M. Ritter and P.K. Moore.
- *Pulmonary Physiology and Pathophysiology: an integrated case-based approach*, by J.B. West (Lippincott Williams & Wilkins).
- Useful Websites & Resources
 - <http://www.netanatomy.com>.
 - <http://www.pathcal.ac.uk>.
 - http://www.path.uiowa.edu/virtualslidebox/nlm_histology/index.html

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