Cambridge **TECHNICALS LEVEL 3**

HEALTH AND SOCIAL CARE

Cambridge TECHNICALS 2016

Unit 4

Anatomy and physiology for health and social care

K/507/4368

Guided learning hours: 90

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Guided learning hours: 90

Essential resources required for this unit: none

This unit is externally assessed by an OCR set and marked examination.

UNIT AIM

We eat, we breathe and we control our bodies, as well as responding to the external environment, but why and how? This unit will help you to understand why these essential processes are so important in maintaining life. You will learn not only about the structure and function of some of the cells and tissues involved, but how they form organs and body systems that then have to interact to ensure that the body can provide the conditions necessary for thought, co-ordination, movement and growth.

This unit aims to introduce you to the basic structure and functions of the body systems involved in everyday activities and maintenance of health, including cardiovascular, respiratory and digestive systems. You will also understand the part played by organs such as the pancreas, liver and kidney. You will investigate the systems and organs involved in detecting and responding to change such as the nervous system as well as the eyes and ears.

Unfortunately, things do go wrong and each system has well-known diseases and disorders. Also, as individuals grow older, they are likely to be affected by malfunctions as a result of degeneration. Some of these will simply be inconvenient; others will be life-changers. You will understand the effects on individuals and what has to be done on a daily basis to enable them to lead as full and independent a life as possible.

TEACHING CONTENT

The teaching content in every unit states what has to be taught to ensure that learners are able to access the highest grades.
Anything which follows an i.e. details what must be taught as part of that area of content. Anything which follows an e.g. is illustrative.

For externally assessed units, where the content contains i.e. and e.g. under specific areas of content, the following rules will be adhered to when we set questions for an exam:

- a direct question may be asked about unit content which follows an i.e.

- a direct question will not be asked about unit content which follows an e.g.

Learning outcomes The Learner will:	Teaching content Learners must be taught:	Exemplification
1. Understand the cardiovascular system, malfunctions and their impact on individuals	1.1 Composition of blood, i.e. • erythrocytes • lymphocytes • neutrophils • monocytes • platelets • plasma 1.2 Functions of blood, i.e. • transport • temperature regulation • exchange of materials with body tissues • preventing infection • blood clotting 1.3 Structure of heart, i.e. • atria • ventricles • vena cava • pulmonary arteries and veins • aorta • tricuspid and bicuspid valves	The learner needs to be able to describe the identified components of the cardiovascular system and their structure and functions. Learners may be asked to label diagrams to show their understanding of structure and functions. The learner needs to explain the likely causes and common symptoms of the conditions or malfunctions identified and be able to relate them to the structures studied. Only the conditions identified will be examined. Learners need to be able to link the structure and functions of the cardiovascular system to the identified conditions, where appropriate. For example, plaque build-up in coronary arteries and how this links to coronary heart disease. The learners need to analyse the impact of the identified conditions on individuals in terms of any necessary monitoring, routine treatment, such as those listed, lifestyle changes and impact on daily life, care needs etc.

Learning outcomes	Teaching content	Exemplification
The Learner will:	Learners must be taught:	
	• semi-lunar valves • coronary arteries 1.4 Function of heart, i.e. • double pump • diastole • systole • cardiac cycle • role of component parts 1.5 Control and regulation of cardiac cycle, i.e. • location and role of SA and AV nodes • Purkyne fibres • ECG trace (P, Q, R, S and T waves/spikes) 1.6 Types, structure and functions of blood vessels, i.e. • arteries • veins • capillaries 1.7 Formation of tissue fluid and lymph, i.e. • role of hydrostatic pressure • blood proteins • structure and role of lymphatic system 1.8 Cardiovascular malfunctions – possible causes and effects on the individual, i.e. • hypertension • coronary heart disease (e.g. angina, heart attack) 1.9 Monitoring, treatment and care needs for the cardiovascular malfunctions listed to include impact on lifestyle changes, medication, blood pressure readings, ECG traces, coronary bypass as appropriate to the condition	The use of NHS resources and other organisations' websites may provide a useful source of information about causes, treatment and the impact on the individual for the listed conditions.

Learning outcomes	Teaching content	Exemplification
The Learner will:	**Learners must be taught:**	
2. Understand the respiratory system, malfunctions and their impact on individuals	2.1 Structure of respiratory system, i.e. • larynx • trachea • bronchi • bronchioles • alveoli • diaphragm • intercostal muscles • pleural membranes 2.2 Inspiration and expiration, i.e. • role of pleural membranes • role of diaphragm • role of intercostal muscles 2.3 Gaseous exchange. i.e. • role and structure of alveoli walls • diffusion gradients • erythrocytes • plasma 2.4 Cellular respiration, i.e. • role of glucose • oxygen • function of ATP • aerobic/anaerobic respiration • production of carbon dioxide • production of lactic acid • production of ATP 2.5 Respiratory malfunctions – possible causes and effects on the individual, i.e. • asthma • emphysema • cystic fibrosis	The learner needs to be able to describe the identified components of the respiratory system and their structure and functions. They may be asked to label diagrams to show their understanding of their structure and functions. The learner needs to explain the likely causes and common symptoms of the conditions or malfunctions identified and be able to relate them to the structures studied. Only the conditions identified will be examined. Learners need to be able to link the structure and functions of the respiratory system to the identified conditions, where appropriate. For example, the impact of asthma on the function of the lungs. The learner needs to analyse the impact of the identified conditions on individuals in terms of any necessary monitoring, routine treatment such as those listed, lifestyle changes and impact on daily life, care needs etc. The use of NHS resources and other organisations' websites may provide a useful source of information about causes, treatment and the impact on the individual for the listed conditions.

Learning outcomes The Learner will:	Teaching content Learners must be taught:	Exemplification
	2.6 Monitoring, treatment and care needs for respiratory Malfunctions listed to include impact on lifestyle, inhalers, medication, peak flow, physiotherapy, spirometry, oxygen as appropriate to the condition	
3. Understand the digestive system, malfunctions and their impact on individuals	3.1 Gross structure of digestive system and functions of component parts, i.e. • buccal cavity • salivary glands • epiglottis • oesophagus • stomach • small intestine • large intestine • rectum • anus • liver • gallbladder • bile duct • pancreas • pancreatic duct 3.2 Mechanical and chemical digestion, i.e. • action of chewing • action of stomach • action of digestive enzymes in stomach and small intestine 3.3 Digestive roles of liver and pancreas, i.e. • digestive role of pancreatic juice • digestive role of bile	The learner needs to be able to describe the identified components of the digestive system and their structure and functions. Learners may be asked to label diagrams to show their understanding of their structure and functions. The learner needs to explain the likely causes and common symptoms of the conditions or malfunctions identified and be able to relate them to the structures studied. Only the conditions identified will be examined. Learners need to be able to link the structure and functions of the digestive system to the identified conditions, where appropriate. For example the function of the gallbladder and how and why gallstones form. The learner needs to analyse the impact of the identified conditions on individuals in terms of any necessary monitoring, routine treatment, such as those listed, lifestyle changes and impact on daily life, care needs etc. The use of NHS resources and other organisations' websites may provide a useful source of information about causes, treatment and the impact on the individual for the listed conditions.

Learning outcomes The Learner will:	Teaching content Learners must be taught:	Exemplification
	3.4 Absorption and assimilation, i.e. • adaptations of intestine wall for absorption (e.g. nutrients) • liver's role in assimilation 3.5 Digestive malfunctions – possible causes and effects on the individual, i.e. • Irritable Bowel Syndrome • gallstones • coeliac disease 3.6 Monitoring, treatment and care needs for digestive malfunctions listed to include impact on diet/lifestyle, endoscopy, ultrasound, lithotripsy and monitoring, medication as appropriate to the condition	
4. Understand the musculoskeletal system, malfunctions and their impact on individuals	4.1 Structure of bone, i.e. • vertical and transverse sections 4.2 Types of joint, i.e. • ball and socket (e.g. hip, shoulder) • pivot (e.g. neck) • hinge (e.g. elbow, knee) • sliding (e.g. wrist, ankle) • fixed (e.g. cranium, pelvis) 4.3 Components of a synovial joint, i.e. • muscle • bone • ligament • tendon • cartilage • synovial capsule • synovial fluid 4.4 Muscle action around a joint, i.e. • antagonistic action of skeletal muscle	The learner needs to be able to describe the identified components of the musculoskeletal system and their structure and functions. Learners may be asked to label diagrams to show their understanding of their structure and functions. The learner needs to explain the likely causes and common symptoms of the conditions or malfunctions identified and be able to relate them to the structures studied. Only the conditions identified will be examined. Learners need to be able to link the structure and functions of the musculoskeletal system to the identified conditions, where appropriate. For example, the role of cartilage in a joint and how this relates to arthritis. The learners need to analyse the impact of the identified conditions on individuals in terms of any necessary

Learning outcomes	Teaching content	Exemplification
The Learner will:	**Learners must be taught:**	
	• contraction • relaxation • role of tendons 4.5 Musculoskeletal malfunctions – possible causes and effects on the individual, i.e. • arthritis • osteoporosis 4.6 Monitoring, treatment and care needs for musculoskeletal malfunctions to include impact on lifestyle, clinical observation, blood tests, bone density scans, physiotherapy, exercise, dietary changes, assistive technology as appropriate	monitoring, routine treatment, such as those listed, lifestyle changes and impact on daily life, care needs etc. The use of NHS resources and other organisations' websites may provide a useful source of information about causes, treatment and the impact on the individual for the listed conditions.
5. Understand the control and regulatory systems, malfunctions and their impact on individuals	5.1 Components of nerve systems, i.e. • central Nervous System • peripheral nerves • autonomic system • spinal cord • sensory and motor neurons 5.2 Structure and function of brain, i.e. • cerebral cortex • cerebellum • frontal lobes • corpus callosum • hypothalamus • medulla • meninges 5.3 Nerve action, i.e. • structure of neuron • role of axon/dendron • myelin sheath • synapse	The learner needs to be able to describe the identified components of the control and regulatory systems and their structure and functions. Learners may be asked to label diagrams to show their understanding of their structure and functions. The learner needs to explain the likely causes and common symptoms of the conditions or malfunctions identified and be able to relate them to the structures studied. Only the conditions identified will be examined. Learners need to be able to link the structure and functions of the control and regulatory systems to the identified conditions, where appropriate. For example, the actions of nerves and how these alter in multiple sclerosis. The learner needs to analyse the impact of the identified conditions on individuals in terms of any necessary monitoring, routine treatment, such as those listed,

Learning outcomes The Learner will:	Teaching content Learners must be taught:	Exemplification
	5.4 Organisation and function of endocrine system, i.e. • pancreas • pituitary • adrenal glands • thyroid • hormones 5.5 Structure of kidney, i.e. • cortex • medulla • calyx • ureters • renal artery/vein • urethra • bladder, kidney nephron 5.6 Functions of kidney, i.e. • removal of urea, regulation of water levels, ultrafiltration, reabsorption, osmoregulation, parts of nephron involved 5.7 Breakdown functions of liver, i.e. • deamination, detoxification, production of bile 5.8 The concept of homeostasis, i.e. • principles of homeostasis (monitoring, feedback mechanisms, effectors) and its importance	lifestyle changes and impact on daily life, care needs etc. The use of NHS resources and other organisations' websites may provide a useful source of information about causes, treatment and the impact on the individual for the listed conditions.

Learning outcomes The Learner will:	Teaching content Learners must be taught:	Exemplification

	5.9 Malfunctions of control and regulatory systems – possible causes and effects on the individual
	• brain, i.e.
	   o stroke
	• CNS, i.e.
	   o multiple sclerosis
	• endocrine, i.e.
	   o diabetes
	• kidney, i.e.
	   o nephrotic syndrome
	• liver, i.e.
	   o cirrhosis
	
	5.10 Monitoring, treatment and care needs for malfunctions of control and regulatory systems to include impacts on lifestyle, physiotherapy, speech therapy, assistive technology, blood tests, urine tests, eye tests, biopsies, scans, medication, dialysis as appropriate	

Learning outcomes	Teaching content	Exemplification
The Learner will:	**Learners must be taught:**	
6. Understand the sensory systems, malfunctions and their impact on individuals	6.1 Structure of the eye, i.e. • pupil • iris • tear glands • humours or fluids • conjunctiva • cornea • retina • macula • optic nerve • ciliary muscle/suspensory ligaments • lens 6.2 Structure of the ear, i.e. • external • middle • inner ear • eardrum • stapes/incus/malleus ear bones • cochlea • organ of Corti • Eustachian tube • round window • auditory nerve • semi-circular canals • ampullae 6.3 Malfunctions of eye and ear – possible causes and effects on the individual, i.e. • eye - glaucoma, AMD, cataracts, retinopathy • ear – deafness 6.4 Monitoring, treatment and care needs for malfunctions of the eye and the ear to include impacts on lifestyle, visual aids, auditory aids, medication)	The learner needs to be able to describe the identified components of the sensory systems and their structure and functions. Learners may be asked to label diagrams to show their understanding of structure. The learner needs to explain the likely causes and common symptoms of the conditions or malfunctions identified and be able to relate them to the structures studied. Only the conditions identified will be examined. Learners need to be able to link structure and function to the identified conditions, where appropriate for example how the degeneration of the macula effects eyesight in the condition AMD The learner needs to analyse the impact of the identified conditions on individuals in terms of any necessary monitoring, routine treatment such as those listed, lifestyle changes, care needs The use of NHS resources and other organisations websites may provide a useful source of information about causes treatment and the impact on the individual of listed conditions.

LEARNING OUTCOME (LO) WEIGHTINGS

Each learning outcome in this unit has been given a percentage weighting. This reflects the size and demand of the content you need to cover and its contribution to the overall understanding of this unit. See table below:

LO1	10-14%
LO2	12-16%
LO3	12-16%
LO4	10-14%
LO5	32-36%
LO6	10-14%

ASSESSMENT GUIDANCE

All Learning Outcomes are assessed through an externally set, written examination paper, worth a maximum of 100 marks and 2 hours in duration.

All questions are mandatory with no optional questions. There will not be any pre-seen material but the learner may be presented with scenarios as part of a question. Questions will be set on the topics indicated in the teaching exemplification by i.e. Where topics follow an e.g. there will not be direct questions set on these but these are merely suggestions as to what learners may choose to study in order to illustrate their answers to the direct questions. Diagrams may be used for testing purposes but again they will only feature points preceded by an i.e. Learners will not be expected to draw diagrams themselves.

In order to allow learners to access all grades from pass through merit to distinction, the questions will test knowledge, comprehension, understanding, research and analysis as well as evaluative skills. Specimen papers will be available but tutors would be advised to devise a range of exercises to test the learners recall and understanding. Regular class tests and the practice of questions against the clock are recommended.

During the assessment of this unit, learners will benefit from using learning from the following units and Learning Outcomes:

Unit 14, The impact of long-term physiological conditions – LO1 Know what long-term physiological conditions are; their causes and symptoms

Unit 15, Promoting health and wellbeing – LO1 Understand reasons for maintaining a healthy lifestyle

Unit 18, Caring for older people- LO1 Understand the ageing process

Unit 22, Psychology for health and social care – LO3 Understand the impact of chronic illness and long-term health conditions on individuals