Unit 7: Anatomy and Physiology for Health and Social Care

Delivery guidance

Approaching the unit

This unit will give learners the opportunity to gain an understanding of how their own physical body works as well as knowledge of some common health problems that people may have. During the delivery of the unit, learners should have an opportunity to investigate how the human body is organised, using a variety of media including fresh specimens of tissue, prepared microscope slides of tissues, diagrams, anatomical models, interactive software, video clips etc.

There should be a focus throughout the unit on the work-related relevance and how knowledge and understanding of anatomy and physiology can inform practice in health and social care settings.

Some learners may have personal experience of disease or physical dysfunction, of one or more of the systems, and sensitivity will be required when approaching the unit. Learners will need to develop a knowledge of routine care that may be available to support service users who are affected by the system malfunctions that have been identified. Access to a range of textbooks, and relevant websites should be available to learners and television documentaries along with newspaper and magazine articles can support learners with further research.

Opportunities to discuss the impact of system malfunctions and care with practitioners and service users can give extra enhanced support and understanding to the learning experience.

Delivering the Learning aims

Learning aims A and **B** - Know the organisation of the human body and Understand the structure, function and interrelationship of major body systems

Learners would benefit from practical laboratory experience using microscopes, viewing and dissecting tissues, though these are not obligatory, and good quality audio-visual materials, models and simulations can also provide learners with similar experiences.

Learners benefit from seeing visually the shape, size and position of organs. Learners could make their own visual resources to display in the learning area, this will help embed the physical body organisation and structures, knowledge they will use to work independently on the assessment.

Studying the systems in an order that links to how they interrelate helps students organise the information and improves understanding. It will also benefit in guiding learners to make appropriate selection of two systems for the assessment.

Homeostasis is a concept that learners often find difficult to understand and time should be taken to ensure the learners are confident about the different mechanisms of homeostasis before undertaking the assessment. Using models to teach homeostatic mechanisms supports learners well.

Giving learners the opportunity to present their findings from research will encourage them to organise their ideas and thoughts, as well as having an opportunity to give and receive feedback from peers and tutors.

Visits to hospital laboratories where tissues samples are viewed and tested or health centres where measurements and observations are recorded would help learners with the vocational aspects of the unit. Alternatively, a visit from a practitioner would be of benefit.

Learning aims C and D Be able to carry out routine measurements and observations of body systems and Know body system malfunctions and appropriate routine care

The routine measurements and observations should be carried out on peers, not real services users, for health and safety reasons. Though learners may observe practitioners taking these during placements and can reflect on the experiences, confidentiality must always be respected. Learners should be encouraged to use case studies of real or fictional characters for system malfunctions and the routine care, always respecting confidentiality.

Local health practices may have facility for guest speakers along with ambulance and first aid organisations, who can discuss system malfunctions and health care routines. They may also be willing to teach; how to take and record routine observations and measurements, discussing the relevance to work scenarios.

When covering Unit measurements, of blood, urine etc, for practical and safety reasons it is recommended that learners are directed to measurements of the respiratory and cardiovascular systems only, such as blood pressure, breathing rate, lung capacity, heart rate etc because these can be easily obtained and observed. Learners will need time to practice taking observations and measurements.

The delivery of the malfunctions of body systems can be enriched by learners' own experiences or those of family members/friends but there needs to be sensitivity in some instances, particularly with long term condition as well as terminal and life changing disorders.

Time and access to resources needs to be given so learners can find and use a variety of resources of information about the two system malfunctions they will discuss in their assessment. There are many organisations that are set up to support people with health conditions and these can be a useful source of information for routine care, but learners need to be guided on how to select and use the relevant information that will be required in their assessment.

Assessment model

Learning aim	Key content areas	Recommended assessment approach
A Know the organisation of the human body	**A1** Organisation **A2** Structure of main body organs **A3** Location of main body organs	Presentation, wall display, a series of booklets or webpages that include diagrams labelled and annotated to give information on two body systems and how the two systems work together.
B Understand the structure, function and interrelationship of major body systems	**B1** Systems **B2** Body functions **B3** Interrelationships	
C Be able to carry out routine measurements and observations of body systems	**C1** Observations **C2** Routine physiological measurements **C3** Health, safety and accuracy considerations	Observation Records/Witness Statements Records of results/client charts Risk assessment/calibration as appropriate
D Know body system malfunctions and appropriate routine care	**D1** Malfunctions **D2** Potential risk **D3** Routine care	Training support pack/ care plan for client.

Assessment guidance

This unit is internally assessed. There is a maximum number of three summative assignments for this unit. Tutors should refer to the assessment guidance in the specification for specific detail, particularly in relation to the requirements for Pass, Merit and Distinction grades.
Learners must provide independent, valid and authentic evidence to meet the assessment criteria. Secondary sources must be referenced, and learners are expected to include a list of sources.
It is suggested that **learning aims A and B** are assessed using an annotated visual display possibly a website/page or an information booklet. Within this, learners need to identify and discuss the organisation of the human body systems including illustration of the position and relative size of the main organs of the body. Additionally, two of the major interrelated systems need to have their structure and function illustrated and discussed in more detail. Selecting two systems *that interrelate* is important and tutors should ensure learners select appropriate systems. To gain the distinction level learners will need to be able to discuss how the two systems selected maintain homeostasis by their interrelation.

Learning aims C and D will build on the knowledge demonstrated in the assessment of **Learning Aims A and B.**

Learners would benefit from a simulated health care setting where they would take and record observations and measurements to support peers, as service users with imagined or real respiratory or cardiovascular malfunctions. They will need to use equipment they have become familiar with to take measurements and demonstrate they know how to record clearly and accurately observations and measurements for two body systems as well as being able to explain how they carried them out. It is recommended learners are directed to use the respiratory and

cardiovascular systems as these lend themselves more readily to measurements that can easily be taken in most education settings.

In their evidence of assessment learners need to demonstrate knowledge of a malfunction for each of the two systems they select, this includes information on the malfunction and explanations of how observations and measurements change as a result of the malfunction. Routine care for each malfunction needs to be identified and justified along with an explanation of how this care affects the system for the learner to achieve at the distinction level.

To accomplish this the learners will need to have access to normal values for the measurements and observation, which could be from secondary sources that should be identified and referenced appropriately.

Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Introduction

Introduce this unit by checking learners' prior knowledge with a quiz or asking them to list all they know of cells, tissues and organisation in the human body. Learners are likely to encounter words and terms that are unfamiliar to them and should be encouraged to build a dictionary alongside a list of the texts they use in their research.

Learning aim A: Know the organisation of the human body

- Learning aim A sets the foundation for the unit upon which the other learning aims build on.
- For A1, Organisation, tutors are required to present information about cells, tissues, organs and systems which can be enhanced with visual aids. Learners will benefit if they have the opportunity to use microscopes and develop investigatory practical skills and when seeing cell and tissue images in books and on websites.
- For A2 and A3, Structure and location of the main body organs, a life size human body cross section model, showing internal organs, would be most useful for delivery and learners will be able to see, in 3D, which will enhance their understanding not just of the physical organisation but later the importance of the interrelationships.
    - There is an opportunity to begin independent study, directing each learner to research different organs and present the information to their peers. This will support those who will later work in the care system, gain a key skill and to confidently share information with colleagues.
    - Note taking is another key skill for care workers and learners can be encouraged to do this when information is presented.
    - Quizzes are a good way to ensure learners have absorbed all the required essential information and an opportunity to clarify any misconceptions.

Learning aim B: Understand the structure, function and interrelationship of major body systems.

- Learning aim B builds on the organisation and looks more in more depth linking structure to function before exploring how the body systems work together. A fun game could be used to ensure learners knowledge from Learning aim A is secure before beginning.
- For B1 and B2, Systems and functions, these could be delivered in a sequence that will help learners to see how the systems interrelate for particular functions. The delivery of the structure and functions should be delivered at the same time so learners can see how they relate to each other.
    - If facilities allow, the learning opportunities can be enhanced by dissection of tissues, but this is not essential.
    - Cardiovascular system - include muscle structure, chambers, blood vessels and the valves. Students can be asked to hold one arm above their heads and the other by their side for 2 minutes and asked to record the observations and possible explanations for this.

- Respiratory system - models are a useful tool to show the branching of air passages in the lungs. Different tissue types should be highlighted and diffusion can be demonstrated. Learners could place hands on a peer's ribcage and after several deep breaths, describe what they feel to their peer. Learners could complete exercise such as running or jumping on the spot and make note to the changes they observe in their heart rate, breathing rate skin colour temperature etc. They could be asked to explain why they have occurred.
- Nervous system - lasers and firework displays can be used as models to highlight the importance of coordination, as well transmitting and preserving signals. Learners could be asked to consider how their reactions change with practice, alcohol, caffeine and age. They could research if their theories are correct, practical activities can be used to show links between the senses and computer programmes can be a useful tool to test reflexes.
- Musculoskeletal system - this can include looking at bones, different types of joint and how they move including how this is supported by ligaments and muscular action.
- Digestive system - More or less detail can be covered here to link with *Unit 9: The Impact of Diet on Health*. Learners could be asked to make a virtual animation of the passage of food through the digestive system.
- Excretory system - dissection of an animal kidney in the laboratory can add an interesting dimension for learners. Learners can be challenged with individual research to find out what urine is made of, how blood is filtered through the nephrons, what is ADH and how does it work or what do they test for when your Doctor asks for a urine sample and why? If practical facilities are available with dipsticks, then samples for testing could be made and learners asked to identify the sample of the service user who is diabetic.
- Endocrine system - learners could research to produce two tables one comparing and contrasting hormone and nervous responses, another showing the hormone, where it is produced and what it controls. You can challenge learners to find a given number or the table could be prepopulated with limited information and learners complete the missing sections.
- Reproductive system - the structure and function of both male and female systems should be taught.
- Crosswords, quizzes and 'true or false' games are useful plenary tools to check learner understanding.

- For B3, Interrelationships requires an understanding of homeostatic mechanisms.
  - The model of how a thermostat works on a house's central heating system can be useful to serve as an analogy and related to similarities as to how homeostatic mechanisms work in the human body.
  - Negative feedback should be covered and how this relates to temperature, blood pressure, blood glucose and oxygen control.
  - Leaners could research which systems work together and how they do this, to maintain the following:
    - **a)** Maintain oxygen supply and remove carbon dioxide
    - **b)** Blood glucose levels
    - **c)** Physical movement
    - **d)** Menstrual cycle.

Learning aim C: Be able to carry out routine measurements and observations of body systems

- Learning aim C requires learners to gain some of the practical skills required by Health Care professionals and be able to explain these. The measurement of heart and lung function are the obvious areas to focus on as they are easiest for learners to complete in an education setting but it is also easy to set up mock urine or blood investigation if a well-equipped laboratory is available.
- For C1, observations need to be taken by learners and it is suggested that they first make observations of skin colour and texture, evidence of sweat, temperature on touch, breathing rates, etc. of a peer when they are relaxed. This can then be extended to how these change after exercise or if someone is unwell.
- For C2, Routine physiological measurements
  - Learners need to be shown how to take and record routine observations and measurements and this could be an opportunity to invite a guest speaker or for learners to visit a health and social care setting.
  - Pulse rate, blood pressure, breathing rate, peak flow, oxygen saturation, body temperature, blood glucose levels (simulated), BMI and eyesight tests are all examples that learners could practice skills in.
  - Learners will need time to practice taking measurements and will benefit from guidance and instruction during this period. For health and safety reasons, they should not take measurements of service users but practice and demonstrate their skills on peers/friends.
- For C3, Health, safety and accuracy considerations need to be taught alongside the routine measurements. Wellbeing of individuals needs to be considered while taking routine measurements. Accuracy, precision and reliability of results need to be taught as well as infection control.

Learning aim D: Know body system malfunctions and appropriate routine care

- Learning aim D requires learners to have knowledge of a range of malfunctions, their associated risk factors and the routine care given in response.
- For D1, D2 and D3, Malfunctions for each of the body systems should be taught and some of these could be delivered by guest speakers such as doctors or nurses. Health care professionals who have particular specialisms, such as a diabetes, can give lots of information about care management, but it is possible for learners to research this independently, if it isn't possible to arrange speakers.
- Learners should have plenty of opportunity to research disorders and the diagnostic techniques professional's use. They need to be familiar with the routine measurements that can change as a result of a malfunction and explain what these changes might be.

Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

This unit links to:

- Unit 2: Ensuring Healthy Living
- Unit 4: Ensuring Safe Environments
- Unit 5: Vocational Experience in a Health or Social Care Setting
- Unit 9: The Impact of Diet on Health.

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC International L2 Qualifications in Health and Social Care. Check the Pearson website at: (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

Haworth, E. and Ashton, A., *Health and Social Care GCSE,* Edexcel, 2009 ISBN: 9781846903472

Haworth, E., Higgins, H., Hoyle, H., Lavers, S. and Lewis, C., *BTEC Level 2 First Health and Social Care Teacher Resource Pack*, Pearson, 2010 ISBN: 9781846906718

Higgins, H., Lavers, S., Garnham P. and Haworth E., BTEC *First Health and Social Care, Student Book,* Pearson, 2012 ISBN 978-1446901359

Rasheed, E., Hetherington, A. and Wyatt, L., *BTEC First Health and Social Care*, Hodder Education, 2008 ISBN: 978-1444111903

Walsh, M., *BTEC First Health and Social Care Level 2 – Student Textbook*, Collins Educational, 2010 ISBN 978-0007342655

Walsh, M., *GCSE Health and Social Care*, Collins Educational, 2009

Waugh, A., and Grant, A., Ross and Wilson *Anatomy and Physiology in Health and Illness*, Churchill Livingstone, 2010 ISBN 978-0702032271

Winston, R., Body – *An Amazing Tour of Human Anatomy*, Dorling Kindersley, 2005

Websites

bbc.co.uk/schools/gcsebitesize/pe/appliedanatomy

GCSE revision activities for anatomy and physiology.

getbodysmart.com

An online textbook with interactive quizzes and tutorials.

innerbody.com/htm/body.html

Shows the anatomy of different body systems.

Pearson is not responsible for the content of any external internet sites. It is essential for tutors to preview each website before using it in class so as to ensure that the URL is still accurate, relevant and appropriate. We suggest that tutors bookmark useful websites and consider enabling students to access them through the school/college intranet.