



Getting Ahead – Pre-course Work

Medical Science Level 3 Applied Diploma

Welcome to **Medical Science**. In preparation for the start of the course, please complete these tasks and have them with you to hand in during your first week of college in September.

These tasks should take you approximately four and a half hours to complete and are designed to give you an introduction to the subject, and the expectations we have for you to complete at least four and a half hours of independent study, per subject, per week.

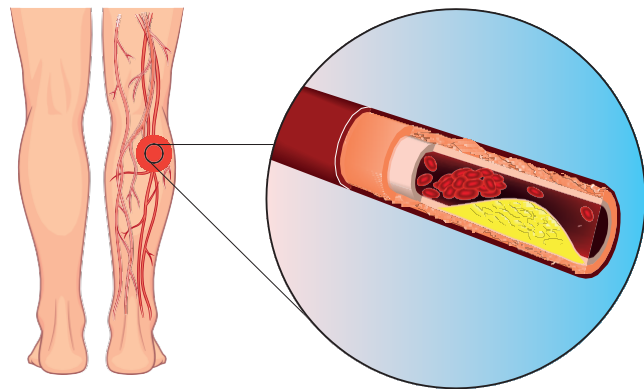
Use this information sheet to help you find the answers to the questions on the following pages. You will be directed to relevant websites for some tasks and will need to use your knowledge of the cardiovascular system from GCSE Science or Biology for others.

Task 1: Deep Vein Thrombosis (DVT)

Deep vein thrombosis is a blood clot in a vein, usually in the leg. It can be life-threatening and medical help is essential.

Symptoms of DVT

- Pain
- Swelling
- Warm skin around the painful area
- Red or darkened skin around the painful area
- Swollen veins that are hard or sore when touched



DVT can lead to a pulmonary embolism if the blood clots travel through the blood stream and reach the lungs.

Diagnosing DVT

Emergency admissions to hospital will undergo a series of tests, including:

- An ECG to test heart activity
- Haematology tests
- Imaging methods to show whether blood is flowing normally through a vein and to determine the position of a blood clot

Treating DVT

Following diagnosis, the main treatment is a course of anti-coagulant tablets. Alternatively, a filter may be placed in a large vein to trap and stop a blood clot travelling to the heart and lungs.



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Preventing DVT

Lifestyle choices can reduce the risk of developing DVT, such as:

- Maintaining a healthy weight
- Taking regular exercise
- Avoiding dehydration
- Avoiding excessive alcohol consumption
- Not smoking
- Avoiding long plane journeys

Use the information sheet on Deep Vein Thrombosis to help you answer these questions. You will also be asked to research some of the answers using the websites provided. You should also be able to use some of your knowledge from GCSE science/Biology to help you too.

- 1) In the boxes below, draw and label the cross section of an artery and a vein. Compare the structure of arteries and veins to give 3 differences.

Artery	Vein
1	1
2	2



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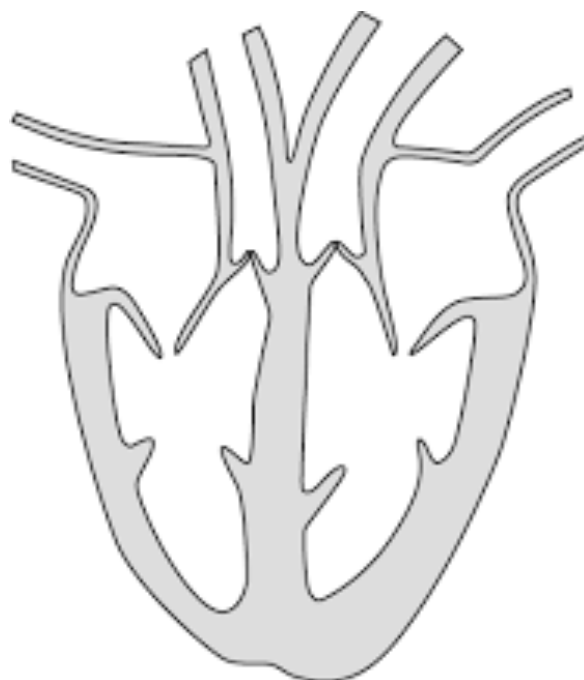
3

3

- 2) Use your knowledge of blood flow through arteries and veins to explain why blood clots are more likely to form in the veins rather than the arteries of the lower leg.
- 3) Which type of blood cell is responsible for producing blood clots?
- 4) Label the diagram of the heart below:

Include the following: Bicuspid valves, tricuspid valves, aortic semilunar valves, pulmonary semilunar valves, vena cava, pulmonary artery, pulmonary vein, aorta, right atrium, left atrium, right ventricle, left ventricle, cardiac muscle.

- 5) Place an X on the diagram to show the location of the hearts natural pace maker. (You may wish to look this up if you did not study Higher tier Biology at GCSE).
- 6) If the coronary arteries which supply the heart muscle with oxygen become blocked, suggest one form of treatment to cure this problem.





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- 7) Place an X on the diagram to show the location of the hearts natural pace maker.
(You may wish to look this up if you did not study Higher tier Biology at GCSE).
- 8) If the coronary arteries which supply the heart muscle with oxygen become blocked, suggest one form of treatment to cure this problem.
- 9) Draw arrows on the diagram above to show the direction that blood flows through the heart. Use Blue to show the passage of deoxygenated blood and red to show the passage of oxygenated blood.
- 10) Use this weblink to the NHS to find out what is meant by the term pulmonary embolism: <https://www.nhs.uk/conditions/pulmonary-embolism/>
- 11) Describe the symptoms of a pulmonary embolism.
- 12) Diagnosing DVT may involve something called an Electro Cardiogram or ECG. Visit this BHF website to find out what an ECG is, why might one be necessary, how it is performed and what is measured.
<https://www.bhf.org.uk/information-support/heart-matters-magazine/medical/tests/electrocardiogram-ecg>

What is an ECG?

Why might an ECG be necessary?

How is it performed?

What is measured?



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13) The resource sheet on DVT states that DVT can be also diagnosed through haematology tests and imaging methods to determine the position of a blood clot such as a venogram.

Use the websites below to carry out some research into these 2 diagnostic techniques and write a brief account of each one. Include any useful diagrams that you can find, but make sure that you refer to these diagrams in order to help make your explanation clearer.

<https://www.nlm.nih.gov/health/blood-tests>

<https://www.wsh.nhs.uk/CMS-Documents/Patient-leaflets/PathologyServices/Haematology/5220-1HaematologyTests.pdf>

Haematology: You should include:

- What are the different tests carried out?
- What measurements are made in these tests?
- What health conditions can be detected using haematology

14) The resource sheet on DVT states that DVT can be also diagnosed through haematology tests and imaging methods to determine the position of a blood clot such as a venogram. Use the websites below to carry out some research into these 2 diagnostic techniques and write a brief account of each one. Include any useful diagrams that you can find, but make sure that you refer to these diagrams in order to help make your explanation clearer.

<https://www.nhs.uk/conditions/deep-vein-thrombosis-dvt/>

<https://www.nhsinform.scot/illnesses-and-conditions/blood-and-lymph/deep-vein-thrombosis/>

Venogram: You should include:

- How is the test carried out?
- What conditions can be diagnosed?



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15) What is the role of a Phlebotomist?

<https://www.healthcareers.nhs.uk/explore-roles/wider-healthcare-team/roles-wider-healthcare-team/clinical-support-staff/phlebotomist>

16) Describe what a phlebotomist needs to do when taking a patient's blood and explain how they should conduct themselves towards the patient?

17) What skills should a phlebotomist have?

18) According to the information sheet on DVT what is the main method of treatment and how does this help treat DVT?

19) Use the weblink below to give 2 examples of anti-coagulants that can be used to treat DVT. <https://www.nhs.uk/conditions/deep-vein-thrombosis-dvt/>

Explain briefly how they work and give details of side effects, who can and can't take it as well as advice about foods, if any, that should be avoided and information on taking these drugs with other medications.

20) What are the lifestyle choices that can reduce the risk of DVT?

21) Briefly explain how each of these can reduce the risk of DVT. <https://www.nhs.uk/conditions/deep-vein-thrombosis-dvt/>

Getting Equipped

You will need the following:

- A ring binder
- Pens, pencils, ruler



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