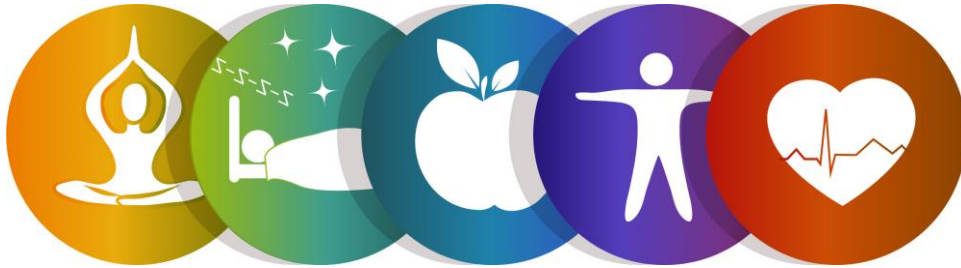


Lifestyle Related Disease: Atherosclerosis



Module:	Introduction to Physiology
Assignment:	Assessment 2 Written Report
Module Code:	BMHP5003_LON
Lecturer:	Laila Surani
Student:	Fatimah Choudhry
Student ID:	2012893
Submission Date:	26th April 2022
Wordcount:	2,156

Contents Page

Assessment 2 Written Report.....	1
Contents Page.....	2
Introduction.....	3
Anatomy and Physiology	3
Health and Lifestyle Routine Measures.....	5
Health and Social Care Practice	6
Recommendations	8
Conclusion.....	9
References	9

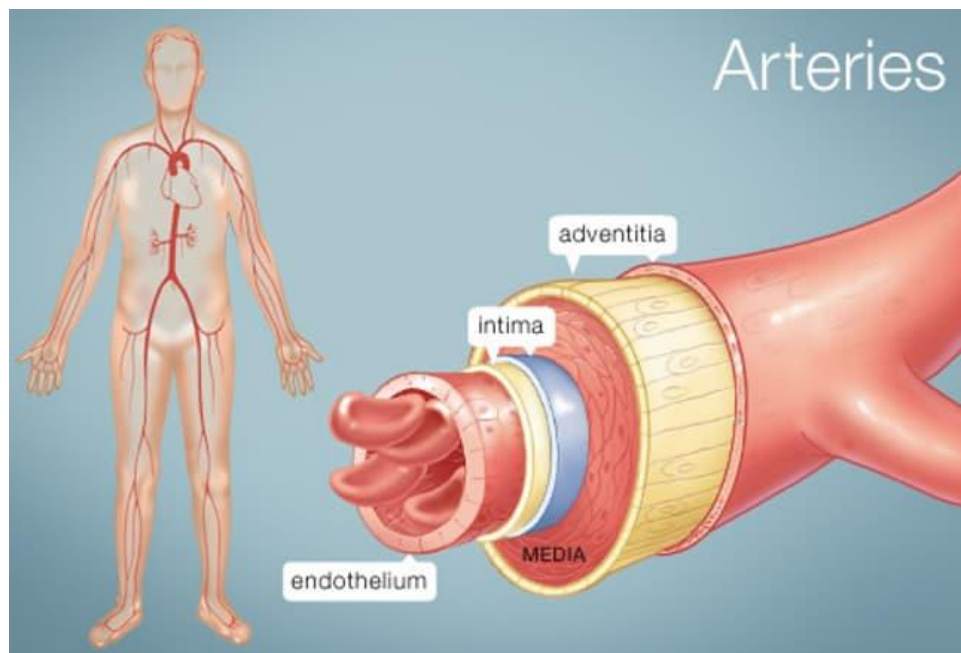
Introduction

The aim of this report is to examine the structure and functioning of the arteries in the circulatory system's body and heart by analysing the relationship between body functioning and relevant detailed anatomy and physiology. The purpose of this analysis of understanding the anatomy and physiology of the arteries in the heart and body is to understand lifestyle-related factors which cause the lifestyle-related issue of Atherosclerosis.

Lifestyle-related diseases are non-communicable diseases, therefore the influencing factor for the disease is due to the person's lifestyle choices. WHO have declared 60% of poor health conditions are due to a person's quality of living, which lead to life threatening illnesses (Farhud, 2015).

Atherosclerosis is when the arteries harden over time mostly due to age, and other lifestyle related choices such as smoking, lack of exercise (Mayo Clinic, 2021). Other major determinants of the lifestyle-related illness atherosclerotic cardiovascular disease (ASCVD) are due to environmental factors such as a low-quality diet, exposure to pollution, poor sleep patterns and psychosocial stress (Lechner, *et al.*, 2019).

Anatomy and Physiology



(DerSarkissian, 2021)

The system involved in the disease atherosclerosis is the circulatory system, which is made up of a muscular organ: the heart, blood vessels: which consist of arteries, veins and capillaries and blood: comprising of red, white blood cells, plasma and platelets. Its main role is to give the body and organs oxygen, nutrients and hormones. The circulatory system also takes away the waste from the body's cells and its organs for disposal (Cleveland Clinic, 2021).

The heart is made up of four chambers, these are called the left and right atrium, and left and right ventricles. From the right side of the heart de-oxygenated blood is transported to the right ventricle, then to the lungs, where the oxygen is absorbed in the blood stream and carbon dioxide is released. The oxygen-rich blood is transported into the left atrium, then into the left ventricle, and circulate into the aortic valve (School of Health Sciences, 2019).

Arteries are blood vessels which transport oxygen-rich blood from the heart to the rest of the body (Brazier, 2020). Each muscular artery has three layers; 1. The 'intima' has a thin layer of tissue cells called the 'endothelium', lining the arteries to help the blood flow more smoothly. 2. The 'media' is made up of muscles which help the arteries manage the pressure from the heart. 3. The 'adventitia' is a tissue which links the arteries to surrounding tissues (DerSarkissian, 2021).



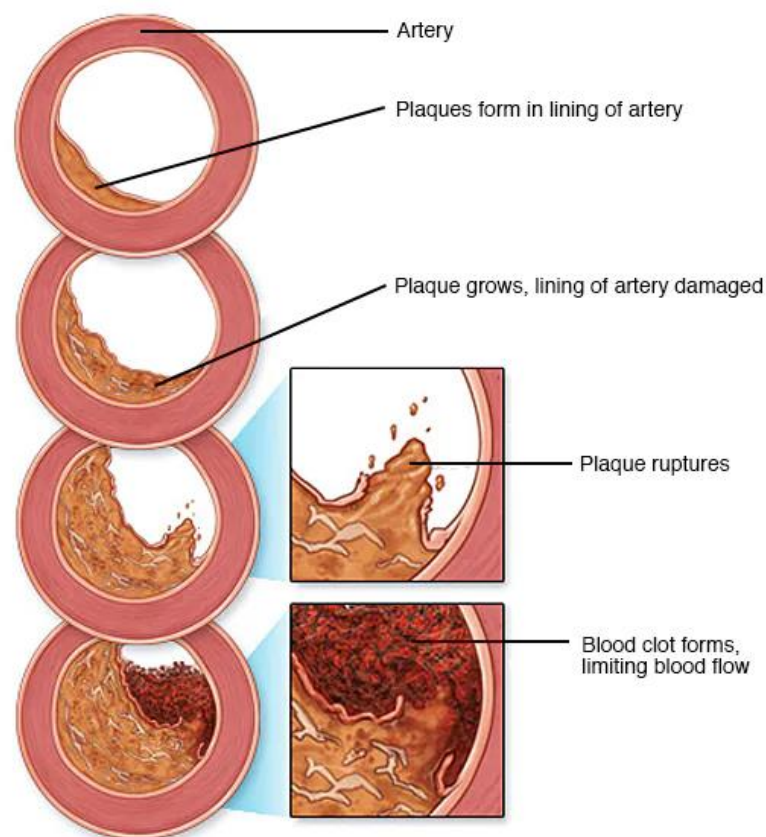
(School of Health Sciences, 2019)

The aorta is the largest artery and major high-pressure vessel that links to the left ventricle of the heart, branching out to smaller arteries called arterioles and capillaries which spread out through the rest of the body. The pulmonary arteries are different in comparison to the aorta as they transport oxygen-poor blood under a low pressure, from the heart to the lungs (DerSarkissian, 2021).

Atherosclerosis affects the circulatory system over a long-term build-up of fats, plaque and cholesterol inside and surrounding the arteries, starting from as early as childhood.

Symptoms may start to appear when the arteries become so narrow, causing a blockage to the blood supply around the body, which occurs when the endothelium tissue lining becomes

damaged through blood flow blockages. The build-up of the plaque can also break open, from which platelets start to stick together and form blood clots. These blood clots of the artery walls can lead to a life-threatening heart attack, cardiovascular heart disease or even a stroke as it can affect arteries anywhere throughout the body. Influencing factors can be smoking, stress and busy lifestyle, causing high blood pressure, intake of high levels of glucose, an unhealthy diet contributing to fats, and high cholesterol levels in the blood (Brazier, 2020).



© MAYO FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH. ALL RIGHTS RESERVED.

(Mayo Clinic, 2021)

Health and Lifestyle Routine Measures

Contributing factors to atherosclerotic cardiovascular disease include the growing global issues of obesity, type 2 diabetes and metabolic syndrome (Lechner, *et al.*, 2019). To help describe routine health and lifestyle measures for gathering information of body functioning of individuals with the health condition atherosclerosis the following healthy lifestyle changes could be put into practice to help prevent the health condition from developing severe

complications, slow it down or even stop the condition from developing in later life if changed from a young age:

1. Following a healthy and balanced diet by avoiding foods that have high levels of salt, sugar and saturated fats can raise cholesterol levels which contribute to narrowing the arteries. Follow the government guidelines of eating five portions of fruits and vegetables per day in a healthy manner and for further advice the local GP should be consulted if the BMI levels are high (NHS, 2019).
2. Maintaining regular exercise according to recommendations of NHS a minimum of 150 minutes of moderate physical activities, such as brisk walking, cycling or swimming should be carried out at least two days a week as this helps to reduce fats in the blood by reducing the risks of developing atherosclerosis (Rochester.edu, 2019).
3. Staying at a healthy weight by aiming for a body mass index (BMI) between 18.5-24.9 by calculating it using the healthy weight BMI calculator (NHS, 2019).
4. Cutting back or stopping smoking by contacting the NHS Smokefree helpline on 0300 123 1044 and getting further ideas and advice about how to quit and discuss treatments available through the GP surgery. Research shows smoking is damaging to the walls of the arteries. Inhaling smoke passively, and vaping is just as dangerous at developing atherosclerosis (Rochester.edu, 2019).
5. Reducing alcohol intake to no more than 14 units of alcohol per week and get advice from the GP about how to no longer consuming any alcohol at all or cut down moderately through interventions and alcohol anonymous groups (NHS, 2019).
6. Regularly monitoring a healthy blood pressure, healthy cholesterol and blood sugar levels through seeking advice from the GP about how to maintain the balance. Suffering from high blood pressure causes the artery walls to get thicker and harden. Having high levels of blood sugars also develop a higher risk of getting atherosclerosis (Brazier, 2020).

Health and Social Care Practice

There are approximately 2.6 million people suffering in the UK with surrounding blocked arteries of the heart, leading to serious health conditions such as angina or lead to a heart attack (British Heart Foundation, n.d.). Atherosclerosis is the main, most common cause of heart-related diseases and strokes, and the cause of approximately 50% of deaths in western society. People who are in good health over the age of 40 have a 50% chance of forming severe atherosclerosis, and it progresses as they age. People who have some signs of atherosclerosis over the age of 60, may not display strong signs of the condition.

However, as it can develop into cardiovascular disease and is the underlying cause of it in the UK statistics show it is, unfortunately, the world's number one cause of death or have terrible consequences which could affect a person long-term (The Heart Research Institute UK, 2022).

According to Public Health England (PHE), over the past few decades, they have put forward many measures to try to reduce the number of deaths caused by cardiovascular diseases in England. However, within the health and social care practice, the increase in the ageing population has been a challenge as the population lifespan is increasing among those who are living with long-term health problems (PHE, 2022).

The measures PHE have taken are by setting up a national programme called The NHS Health Check, which is a health check-up in England for 40-74-year-olds and can be taken every 5 years. It helps prevent early signs of heart disease and even detect them. From April 2013-March 2018 over 6.86 million people have been able to have the check-up (PHE, 2022).

Another medical product PHE have introduced was The Heart Age Test, this is for the public to use online to be able to measure the age of their heart and think of which measures they can follow to make lifestyle changes to help them. It has been completed by over 2 million people and been advertised widely within local authorities. The local authorities have also provided service users with free blood pressure check locations to be able to fill out the test accurately (PHE, 2022).

PHE also launched an app called 'Active 10' in June 2018. The aim to launch this app was to help inactive adults between the ages of 40-60-year-olds from lower socio-economic groups to go for a 10-minute brisk walk every day. The app helped to set further goals into their daily routine and give motivational pointers. It is an app which is aimed to reduce risks of early deaths. Figures show the app had been downloaded 732,000 times from June-September 2018 (PHE, 2022).

In March 2018, PHE introduced reduced salt and sugar levels in foods and put policies forward to reduce the intake of extra calories, as these factors led to people becoming overweight or obese and contributing factors to cardiovascular disease as too much salt leads to high blood pressure. PHE realised the key actions would be to reduce 20% calories intake over 5 years, reducing 35,370 deaths within this time and save £4.5bn of social care and the NHS over 25 years (PHE, 2022).

Another way PHE is working to support the health services is by helping smokers stop smoking with support from CQUIN (Commissioning for Quality and Innovation). From 2018-

2019 4.5 million patients were supported and since have the aim to deliver a Smokefree NHS agenda (PHE, 2022). The Public Health Outcomes Framework (PHOF) findings were that the number of smokers in England reduce each year. In 2012, 19.3% of adults smoked but it reduced in 2016 to 15.5% of adults smoked. During PSHE lessons in school children were also taught the health risks of smoking with the aim of preventing children and young people below the age of 19 from smoking (NICE, 2022).

Recommendations

Public Health England has recognised that early prevention interventions will help reduce lifestyle-related conditions related to the heart and slow down the progress of atherosclerosis if the changes start by improving children's lifestyles. Therefore, PHE is reducing salt and sugar intake in school lunches and teaching children the health risks of smoking at schools (PHE, 2022). However, there are still fast-food chains growing rapidly and targeting to attract children and young people through advertisements and opening close to schools. PHE need to address this matter by reducing the advertisements during children's programmes and not let fast food restaurants open within a certain proximity to schools.

Schools also ensure children and young adults up to the age of 16 have physical education twice a week. However, this stops and becomes the individual's choice after this age to exercise. This could continue in other educational settings after the age of 16 and in the work-places adults should be given the opportunity to exercise by being offered affordable gym memberships and access to swimming pools.

PHE have a lot of measures around the country in place, however, there appears to be a lack of knowledge of people being aware of lifestyle related illnesses until they either start to feel unwell or suffer from a lifestyle-related threatening experience. It is important that NHS and Public Health England start to advertise what they offer to improve health on TV and radio shows in an attractive manner and they ban promoting unhealthy lifestyle adverts, like about chocolates, crisps, sweets and fast-food restaurant children's meals. If healthcare professionals and all communities worked together, everyone can promote a better lifestyle. Such as children can walk to school together as a walking bus instead of travel by car or bus.

There is a large strain on the NHS due to a global pandemic of lifestyle related illnesses growing rapidly, however if the NHS invested more money into the infrastructure of preventing the lifestyle diseases, England could be one of the healthiest countries in the world. England have some of the best strategies in the world, however, putting them into action is challenging (NICE, 2022).

Conclusion

It is apparent that atherosclerosis is a potentially serious lifestyle-related condition where artery walls become blocked and could lead to detrimental effects. However, once this occurs, there is no cure, other than to turn to leading a healthier lifestyle, as this can slow down the progressive effects of it developing negatively. With the strategies Public Health England has in place of The NHS Health Check and The Heart Age Test if these were open to any age and everyone was aware of these, they could pick up any health problems earlier and adapt a healthier lifestyle earlier, by maintaining a healthy diet and leading a more active lifestyle. This would prevent the conditions progression through these awareness interventions and investing this lifestyle in our children, who are our future generation and will have the opportunity to live better, longer and healthier lives.

References

Al-Mamari, A. (2009). Atherosclerosis and Physical Activity. *Oman Medical Journal*.

Brazier, Y. (2020). *Atherosclerosis (arteriosclerosis): Causes, symptoms, and more*. [online] www.medicalnewstoday.com. Available at: <https://www.medicalnewstoday.com/articles/247837#what-is-atherosclerosis> [Accessed 25 Apr. 2022].

British Heart Foundation (n.d.). *Research into atherosclerosis: 4 scientists talk about their work*. [online] www.bhf.org.uk. Available at: <https://www.bhf.org.uk/information-support/heart-matters-magazine/research/atherosclerosis> [Accessed 24 Apr. 2022].

Cleveland Clinic (2021). *Circulatory System: Anatomy and Function*. [online] Cleveland Clinic. Available at: <https://my.clevelandclinic.org/health/body/21775-circulatory-system#:~:text=Your%20heart%20and%20blood%20vessels> [Accessed 24 Apr. 2022].

DerSarkissian, C. (2021). *The Arteries (Human Anatomy): Picture, Definition, Conditions, & More*. [online] WebMD. Available at: <https://www.webmd.com/heart/picture-of-the-arteries#:~:text=Each%20artery%20is%20a%20muscular> [Accessed 24 Apr. 2022].

Farhud, D.D. (2015). Impact of Lifestyle on Health. *Iranian journal of public health*, [online] 44(11), pp.1442–4. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4703222/> [Accessed 24 Apr. 2022].

Lechner, K., von Schacky, C., McKenzie, A.L., Worm, N., Nixdorff, U., Lechner, B., Kränkel, N., Halle, M., Krauss, R.M. and Scherr, J. (2019). Lifestyle factors and high-risk atherosclerosis: Pathways and mechanisms beyond traditional risk factors. *European Journal of Preventive Cardiology*, [online] 27(4), pp.394–406. Available at: <https://pubmed.ncbi.nlm.nih.gov/31408370/> [Accessed 24 Apr. 2022].

Mayo Clinic (2021). *Arteriosclerosis / atherosclerosis - symptoms and causes*. [online] Mayo Clinic. Available at: <https://www.mayoclinic.org/diseases-conditions/arteriosclerosis-atherosclerosis/symptoms-causes/syc-20350569> [Accessed 24 Apr. 2022].

NHS (2019). *Atherosclerosis (arteriosclerosis)*. [online] NHS. Available at: <https://www.nhs.uk/conditions/atherosclerosis/> [Accessed 25 Apr. 2022].

NICE (2018). *cardiovascular disease prevention*. [online] Available at: <https://www.nice.org.uk/Media/Default/About/what-we-do/Into-practice/measuring-uptake/nice-impact-cardiovascular-disease-prevention.pdf> [Accessed 25 Apr. 2022].

PHE (2022). *NHS Health Check - Home*. [online] www.healthcheck.nhs.uk. Available at: <https://www.healthcheck.nhs.uk/> [Accessed 25 Apr. 2022]. Public Health England.

Rehman, I. and Rehman, A. (2022). *Anatomy, Thorax, Heart*. [online] PubMed. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK470256/#:~:text=The%20heart%20consists%20of%20four> [Accessed 4 Feb. 2022].

Rochester.edu. (2019). *What You Can Do to Prevent Atherosclerosis - Health Encyclopedia - University of Rochester Medical Center*. [online] Available at: <https://www.urmc.rochester.edu/encyclopedia/content.aspx?contenttypeid=1&contentid=1583> [Accessed 25 Apr. 2022].

School of Health Sciences (2019). *Anatomy and Physiology of the Heart - Normal Function of the Heart - Cardiology Teaching Package - Practice Learning - Division of Nursing - The University of Nottingham*. [online] Nottingham.ac.uk. Available at: <https://www.nottingham.ac.uk/nursing/practice/resources/cardiology/function/anatomy.php> [Accessed 24 Apr. 2022].

Siljeholm, M. (2022). *Atherosclerosis: The Anatomy and Physiology of a (Silent) Killer*. [online] www.visiblebody.com. Available at: <https://www.visiblebody.com/blog/atherosclerosis-the-anatomy-and-physiology-of-a-silent-killer> [Accessed 25 Apr. 2022].

The Heart Research Institute UK (2022). *Atherosclerosis*. [online] Heart Research Institute UK. Available at: <https://www.hriuk.org/health/learn/cardiovascular-disease/atherosclerosis> [Accessed 25 Apr. 2022].