Human Body Systems and Homeostasis Case Study

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The human digestive system comprises the intestinal tract and the digestive organs. It involves the digestion and assimilation of the food we eat. A healthy digestive system is crucial to the body's immune system and helps to overcome almost 70% of health conditions. Acne, an inflammatory and chronic skin condition characterized by pimples on the skin, is common in adolescence. It is caused by inflammation of sebaceous glands.

The glands produce the oily substance, which is stimulated by the adrenal glands. Her GP recommends that she eat plenty of vegetables and fruits. This is because vegetables supply vitamins A and E and zinc, which help reduce more severe acne and regulate hormonal levels. Coca-Cola is acidic, and excess acid in the body causes acidosis. Acidosis causes fatigue, loss of enthusiasm, and other symptoms. Fruits and vegetables help reduce this effect. Tiredness and fatigue experienced by Mrs. Brown could be caused by iron deficiency anemia caused by low red blood cell count. This fatigue can also result from heavy menstrual flow or pregnancy. Eating dark green vegetables and drinking less acidic drinks can help increase the blood count.

A BMI below 18.5 is considered underweight. Ms. Brown has a low BMI of 18.5, which is close to being underweight. Her GP advises her to take a balanced diet. High-calorie foods such as fats and regular exercise will help to improve and maintain the BMI in the healthy range. Bloating is excess gas being trapped in the digestive system. High Coca-Cola intakes may have caused bloating, especially when drinking through a straw, since air enters with the drink. This causes unnecessary stomach discomfort. Women are instructed to have a healthy diet (Gardener 2004).

Endocrine System

The system involves chemical hormones, glands, the circulation of chemical messengers to targeted organs, and homeostatic feedback. The system helps in regulating body functions such as metabolism, growth, sexual functions, sleep, moods, and other health functions.
An increase in androgen hormone, which rises during adolescence, causes the growth of the oil gland under the skin. The enlarged glands produce more sebum, which causes facial acne. A healthy diet is recommended by the GP, and an active lifestyle helps to regulate androgen levels. Hypothyroidism is a condition caused by an underactive thyroid gland. This leads to having a low amount of thyroxine hormone, which can make one feel fatigued and depressed, have aching muscles, and have dry skin.

Medication from the GP helps control the medical condition.

Cardiovascular System

The system involves blood circulation and transportation of metabolic products in and out of the body cells. The proper cardiovascular system is essential for general nourishment, an improved immune system, and homeostatic function. Experts say headaches hit when the blood vessels in the skull swell, stretching the nerves around them, hence causing pain. Inflammation of the blood vessels, blood clots, or bleeding in the brain can cause a headache. Disorders in muscles and nerves in the head or neck can lead to a change in chemical activity, hence also leading to headaches. The inflammations are caused by dehydration or stress. Caffeinated drinks also cause a headache. Ms. Brown's GP advises her to take 2 liters of water per day. Taking water helps improve the blood volume level, hence proper oxygen circulation in the brain. Regular physical activity improves mental and physical well-being, which reduces stress. Research shows that Coca-Cola contains 32 mg of caffeine per 200 grams of the drink. Refraining from caffeine helps to reduce a headache.

The Lymphatic And Immune System

The system is composed of the lymph vessels and the immune system, which help fight against foreign antigens. A weak immune system causes one to be susceptible to diseases. Vegetables and fruits help in boosting the immune system. The system has major immunological importance (Holt 2008).

Respiratory System

The system is composed of the upper respiratory tract, nose, pharynx, sinuses, and larynx. The lower respiratory tract consists of the trachea, lungs, diaphragm, and segments of bronchioles and alveoli. The respiratory system involves the passage of air through the vessels, lungs, and the breathing muscles. It aids in the circulation of respiratory gases between air and blood. Oxygen to the cell is essential for the metabolism and nourishment of general health. The system filters breathing air, such as dust, which may cause allergic conditions. It also defends against disease-causing microbes. The system is also responsible for the regulation of homeostatic function by regulating blood pH. This involves monitoring carbon (IV) oxide levels. It also helps regulate water by exhaling excess water. Tuberculosis, influenza, chronic pulmonary disease, and asthma, among other diseases, are conditions caused by dysfunction in the urinary system.

Urinary System

The system consists of the renal system (kidney, ureter, bladder, urethra), which helps in the elimination of waste products in the body and regulation of blood volume, water, and other body metabolites. It is the drainage system for the excess products in the form of urine. The kidney contains numerous blood vessels and nephrons for the purification of blood. Urine production is involved with health conditions such as diabetes and gout. The NMDA receptor has a major role in memory (Kampa 2008).

Type of Disease	Name of disease	Why Mr. Ali is at risk	Effects

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Deficiency – there is a lack of certain nutrients and minerals in the body. Degeneration – certain minerals start to diminish, and organs or tissue lose vitality Infectious diseases are diseases that are transmitted from one person to another, especially through breath.	Osteoporosis Tuberculosis	• He spends most of his time in the office, hence less exposure to sunlight. This causes a deficiency of vitamin D, which leads to the disease. • Poor diet: Mr. Ali consumes fast food, which mainly includes fried foods that are rich in fat content. The food is unbalanced and lacks essential nutrients and minerals such as vitamin D and calcium. Deficiency causes osteoporosis. • He has a sedentary lifestyle since he is involved in less physical activity. He uses public transport to work instead of walking and also spends most of the time sitting in the banking hall, attending to clients with minimum movement. • Mr. Ali drinks and smokes a lot. Drinking and smoking contribute to the disease. • Osteoporosis is also caused by advanced age. As age progresses, there is calcium degeneration in the bones, which leads to weak bones. Mr. Ali is 65 years of age. • The disease is caused by a bacterium called *Mycobacterium tuberculosis* • It can be spread from an infected person to a healthy person through coughing, sneezing, or inhaling expelled bacterial droplets. • Long contact with an infected person can spread the disease. Mr. Ali encounters prolonged connections with people in the banking hall and in using public transport. • It can also be spread by being in crowded places where air circulation is poor. Mr. Ali spends his days indoors in a packed bank hall. He also uses public transportation, which is also crowded. • TB is also associated with old age. Mr. Ali is 65 years old and, hence, susceptible to contracting the disease. • The diseases are also caused by poor diet	• Chronic pain. • Reduced life expectancy • Disability • The bacterial infection causes severe damage to the lungs; this causes severe sneezing and coughing, which may be bloody. • One also develops breathing problems. • If the infection spreads to the brain, it can cause meningitis.

Type of Disease	Name of the disease	Why Mr. Ali is at risk	Effects.

Non-infectious- The disease cannot be transmitted from one person to another. It can be a result of an unhealthy lifestyle.	Tuberculosis Chronic inflammation High blood pressure	• Mr. Ali's diet is composed of fast foods, which are usually unbalanced and unhealthy. A poor diet causes a poor immune system, which makes one vulnerable to infectious diseases. His smoking and drinking lifestyle also contribute to poor health. We should stick to low-fat foods (Gross man 1987). • It is the body's natural way of responding to germs, toxins, stress, and other harmful agents. • Mr. Ali's various lifestyle factors can lead to inflammation. These include: • Fast foods are naturally inflammatory and sugary. These include snacks, fried food, luxurious food. • Stress causes inflammation. Mr. Ali is likely to develop stress due to the long and intense work at the bank dealing with different types of clients. • Drinking and smoking habits • Caused by high blood pressure during the pumping of blood in the arteries. This may be due to thin arteries as a result of the accumulation of fat layers on the vessels. • Mr. Ali's unhealthy habits of eating fast and fatty foods can be a major risk for the infection. He also engages in little physical activity, which is dangerous to his health. • Mr. Ali's drinking and smoking habits can also put him at risk of infection. • He lives a sedentary lifestyle, which makes him vulnerable to being overweight.	• The infection can also cause arthritis, which is characterized by pain in the joints. • Drinking too much alcohol can lead to the degeneration of the kidneys and liver. • Long-term effects of high blood pressure can cause coronary diseases, heart failure, stroke, kidney diseases, and dementia. • Obesity has roughly the same association with chronic health conditions (Sturm 2002).

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