# PHYSIOLOGY PRINCIPLE IN HEALTH AND SOCIAL CARE

The human body is regarded as one of the fascinating structure that has taken scientists a lot of time and effort to study. From the illustrious past, people have been known to try and explore the human body which was majorly done in an unethical method. The study of the human body is quite important since it provides permanent solutions to problems that may affect it e.g. diseases. The human body is seen as being very complex, and its functions are controlled at both macroscopic and microscopic levels. Physiology and anatomy are the important studies that have been made about understanding its functionality. Anatomy deals with the study of the body’s macroscopic parts while physiology deals with the study of the functions of the parts. Since the body may at times face various problems, social care is vital during this periods and it is majorly provided by nurses. Social care specialists must have a fundamental understanding of the anatomy and physiology of the body to perform their function.

This paper has the aim of discussing the anatomical features as well as their physiology and how social care can be provided by observation and evaluation of these parts.

## A general outline of main anatomical features, body systems and how they Correlate.

The human body is mainly divided into several broad features which include the head, the trunk, the abdomen, pelvis, and limbs. These anatomical parts can further be broken down into other smaller anatomical parts. All the anatomical parts contain organs which link up to form body systems. By discussing the organ systems, it is easier to state the other anatomical parts. The functioning of this parts. There are 11 body systems:

### i. Cardiovascular system

The central organ here is the heart, which is a muscular organ located in the thoracic region. It beats in rhythmic patterns and helps in circulation of blood in the whole body, and this is assisted by its division into aorta and ventricles each having the left and right portion. . There are two circulatory loops, systemic and pulmonary. The systemic circulatory loop carries oxygenated blood from the heart to the body parts (except the heart and lungs) whereas the pulmonary loop transports oxygenated blood from body parts to the heart. Blood vessels allow the movement of blood from one region to the other and are lined by endothelium that has simple squamous epithelial cells that prevent clotting. Arteries, veins, and capillaries are the main categories of blood vessels. The capillaries are the thinnest and arteries the thickest. Blood is the liquid connective tissue that carries substances through the body and helps in maintaining homeostasis. It contains erythrocytes, leukocytes, platelets, and plasma.

The function of the cardiovascular system includes transportation of material like nutrients, oxygen, carbon IV oxide, and hormones, offers protection by the help of leukocytes, maintains body homeostasis (ph, temperature osmotic concentration, and pressure) and also aids in hemostasis from the presence of platelets and clotting factors.

### ii. Digestive system

In this system, food passed through the alimentary canal undergoing transformations until a readily absorbable product is formed and the undigested matter is excreted. Main anatomical features include:The mouth, which has the various structure that assists in food breakdown and ingestion like teeth, salivary glands and tongue. Pharynx and esophagus, which act as channels for the passage of food to the stomach. The Stomach is a muscular organ that stores food and allows the action of action of digestive juices and Hydrochloric acid. The small intestine is a coiled tunnel like structure of small diameter and heavily folded. It is where digestion followed by absorption occurs. Liver, gall bladder, and pan crease produce chemicals as well as digestive juices essential for digestion like bile salts and pancreatic lipases. The Large intestine is coiled with a large diameter and takes part in absorption of water.

The primary function of the digestive system includes breakdown of food material into useful products that can be utilized by the body. Six primary functions take place in the digestive system: Ingestion and mastication done by the teeth and mouth and the tongue too; Secretion done by digestive glands e.g. parotid gland; mixing and movement which is aided by muscular organs like the esophagus, stomach and intestines ; Digestion conducted by digestive enzymes like amylase, lipase and peptidase ; Absorption which is done in the intestines where nutrients and water are absorbed ; Excretion of undigested matter from the anus.

### iii. Endocrine system

It includes all glands as well as hormones they produce. Its main anatomical features include: Hypothalamus which is a part of the brain producing hormones like Thyroid releasing hormone and gonadotrophin releasing hormone. Other organs and glands include Pituitary gland (anterior and posterior), pineal body, Thyroid gland and parathyroid glands, Pancrease, the ovary and testes, adrenal glands, and thymus. All these produce various hormones whose functions are specific.Its main function includes regulation of function of various organs. Its effects are usually slower but long lasting. Some of the function include homeostasis, cellular metabolism, reproduction, sexual development, regulation of heart rate and digestion.

### iv. Reproductive system.

This system is classified into male and female reproductive systems. The male reproductive system main anatomical features include; Scrotum, testes and epididymis, penis, seminal vesicles, cowper’s glands, prostrate urethra and semen. The male reproductive system main anatomical features include; the ovaries (produce and contain the eggs as well as produce regulatory hormones), the uterus (site of embryo development), oviduct (route of ovum fertilization), vagina (site of sperm deposition), vulva(route of penetration of the penis) and mammary glands (produce milk).The man function of the reproductive system is the production and storage of sperms in males and production of ovum as well as development of fetus in females.

### v. Integumentary system.

This is an organ system consisting of the skin, hair, nails and exocrine glands. It is considered the largest organ. Its anatomical features include the epidermis, dermis, hypodermis, hair, nails, and sudoriferous, ceruminous and sebaceous glands. Its main functions include keratinization, temperature homeostasis, and vitamin D synthesis, protection of underlying tiisues, provision of skin color, cutaneous sensation and excretion.

### vi. Skeletal system.

It is the strongest system. It acts to provide support as well as enhance locomotion. It also takes part in synthesis of cells e.g. red blood cells. Some of its anatomical components include the cranium, vertebral column, tibia and fibula, patella, ulna and radius, ribs and pelvic girdle, femur and other small bones. Bones are connected by joints which may either be a ball and socket joint or a hinge joint. The joint are responsible for enhancing motion.

### vii. Respiratory system

The body requires constant supply of oxygen that is usually used p during energy production processes. However, the utilization of oxygen leads to the production of a waste gas carbon iv oxide. The respiratory system performs the function of oxygen intake and carbon iv oxide release from the body. It is also involved in homeostatic control of respiration in response to chemoreceptors signaling actions by adjustment of the respiratory rate.

Some major anatomical regions include:The nose, nasal cavities and the mouth.- this are the vessels that are used to channel gasses from the environment into the body or vice versa. They are well structured to perform these functions e.g. the nose is moist with hair to warm and trap dust particles respectively.Pharynx and larynx-The two connect the external opening to the trachea and also channel gasses.The trachea which provides a clear air way for air to enter and exit the lungs. It links the pharynx to the bronchi.Bronchi and bronchioles- The latter is heavily branched and both serve the purpose of channeling gasses between the trachea and lungs. The two have a c shaped cartilage layer that keeps them open. The two are also dilated to prevent air resistance and allow passage of more air.

The lungs is the main organ and it is spongy and contains millions of alveoli that are heavily vascularized and the primary spot of air exchange. There are two lungs per individual and each is lobed. (the left has 2 lobes and the right has 3).Muscles of respiration which include intercostal muscles located within the ribs, the diaphragm that forms the floor of the thorax. These muscles serve the purpose of allowing inhalation and exhalation during the contraction and relaxation processes.

### viii. Muscular system

It provides is responsible for the movement of the human body. There are about 700 muscles attached to the bones and each contains blood vessels, tendons, nerves and skeletal muscle tissues. There are 3 muscle types: skeletal muscle (voluntary muscles attached to bones), cardiac muscles (involuntary muscles found in the heart and assists in its palpation) and visceral muscles (found inside organs like stomach, intestine and blood vessels).Muscles are attached to bones by tendons. Movement is made possible by continuous shortening and relaxing of muscles. The bsic functional unit of muscles is the sarcomere which contains huge number of mitochondria and its activity is regulated by the concentration of calcium ions. Each sarcomere contains thin and thick filaments. Thin filaments contains actin, tropomyosin, and troponin proteins while thin filaments have myosin proteins. These are the functional proteins involved in contraction.

Apart from enhancing movement, is the second function of maintenance of posture and body position. It also assists in the movement of substances in body organs e.g. heart and stomach.

### ix. Nervous system

It has three main functions; sensory, integration and motor. Sensory functions involve collection of information from sensory receptors and channeling it to the CNS. Integration involves the process of evaluation, comparison, and usage of acquired information for decision making as well as discard of unwanted information. Motor function involves the transfer of processed information from the CNS to the efferent neurons.The nervous system major anatomical structure include the brain, spinal code, sensory organs and other sensory nerves.

Nervous tissues are made up of neurons that communicate by transmitting of electrochemical signals. There are three classes of neurons; afferent neurons, efferent neurons, and interneurons. The nervous tissue is also made of neuroglia which protects, insulate and feed neurons. The brain, located in the cranium, contains millions of neurons and it controls all the neural activities. It pairs with the spinal cord to form the Central Nervous system, where information is processed, and response originate. The spinal cord carries information through the vertebral cavity from the medulla oblongata to the lumbar region of the spine. Nerves are responsible for channeling signals from the peripheral nervous system to the central nervous system. They are divided into afferent nerves (Carry signals from the sensory receptor to the CNS), efferent nerves (carry information from the CNS to the affectors) and mixed nerves. Other specialized nerves include cranial nerves and spinal nerves. The meninges usually give protection to the brain as well as provide nourishment. The cerebral spinal fluid surrounds the CNS and performs the functions of maintaining homeostasis, providing protection and nourishment, enhancing buoyancy, acting as a shock absorber and waste removal.

### x. Urinary system

It consists of kidney, ureters, urinary bladder and urethra. Two kidneys are protected by a layer of adipose tissue and are involved in the filtration of metabolic wastes excess ions and chemicals from the blood to form urine. The uretus carry urine from the kidney to the bladder which stores urine before it is transported but the urethra for elimination.The functions of the urinary system include filtration, storage and subsequent elimination of wastes, maintenance of homeostasis including osmotic concentration blood pressure and Ph. It is also involved in the production of hormones like erythropoietin, calcitriol, and renin.

### xi. Immune and Reproductive system

The immune system has a major function of protecting the body against infectious pathogens while the lymphatic system contains capillaries, vessels nodes, and other organs that transport lymph fluid from tissues to the blood. The red bone marrow is highly vascularized and is involved in the production of leukocytes. On the other hand, lymphoid cells produce T-lymphocytes and B-lymphocytes( Differentiate to produce antibodies).Lymph fluid usually travels in lymphatic capillaries.One of the main function of the lymphatic system is drainage of fluid from tissue and back to the circulation. It also transports fatty acids and stores lymphocytes.

## How the body systems interact to carry out their functions.

All body systems require each other to function properly, however, the nervous system and the endocrine system are two regulatory systems that enhance these activities. Some of the functions are usually involuntary other voluntary. The nervous system is usually more rapid, lasts for a short period and involves the transfer of electrochemical signals from one system to another. On the other hand, the endocrine system is usually slower and lasts for an extended period and involves the transfer of hormones. Also, the functioning of these two systems depends on each other to regulate the functioning of other systems too.

Diagram to display anatomical features

## Importance of understanding human anatomy as well as its relation to health and social caregivers

Understanding human anatomy and physiology give’s one the competency to deal with health problem issues. This first assists them in carrying out all physical examinations, coming up with diagnosis, prescribing medicine if necessary, making follow up and providing tender care and love to their patients. An understanding of the subject proves the fact that one is in a better position of saving lives since he can easily predict what a patient is undergoing and quickly pinpoint out the possible solution. It is also essential for enhancing communication among the healthcare workers. To add on that, understanding of this subject helps health caregivers to educate their patients, advocate for their health and ensure that the medication provided is the most appropriate.

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