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REVIEW ARTICLE

A COMPARATIVE ANALYSIS ON HUMAN BEING PHYSIOLOGY AND ANATOMY

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A Comparative Analysis on Human Being Physiology and Anatomy

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INTRODUCTION

Anatomy: the expression anatomy is determined from a Greek word "Anatome" intending to cut up. It is the investigation of structures that make up the body and how those structures relate with each other. The investigation of anatomy incorporates numerous sub distinguishing offerings. These are Gross anatomy and Microscopic anatomy.

Gross anatomy studies body structure without microscope. Systemic anatomy studies utilitarian relationships of organs inside a system although Regional anatomy studies body part regionally. Both systemic and regional methodologies may be used to study gross anatomy Microscopic anatomy (Histology) obliges the utilization of microscope to study tissues that structure the different organs of the body.

The human body has distinctive structural levels of association, beginning with atoms molecules and mixes also expanding in size and intricacy to cells, tissues, organs also the systems that make up the complete organic entity. Atoms molecules and mixes: - At its easiest level, the body is made out of atoms. The most well-known components in living life form are carbon, hydrogen, oxygen, nitrogen phosphorus and sulfur.

Atoms → Molecule → Compounds.

Cell: The most modest autonomous units of life. All life depends on the numerous chemical exercises of cells. A portion of the fundamental capacities of unit are: development, metabolism, touchiness and proliferation.

Tissue: tissue is made up of numerous comparative cells that perform a particular capacity. The different tissues of the body are isolated into four aggregations.

Organ: - Is a joined gathering of two or more sorts of tissue that cooperates to perform particular capacity. For sample: Stomach is made of all sort of tissues.

The dialect of anatomy will most likely be unfamiliar to you at initially. Be that as it may once you have comprehended the fundamental word roots, joining word structures, prefixes and addition you will find that anatomical terminologies are not as troublesome as you first envisioned.

Anatomical positions are all around acknowledged as the beginning indicates for positional references the body. In anatomical position the subject is standing erect and confronting the onlooker, the feet are as one, and the arms are hanging at the sides with the palms confronting forward.

THE INTEGUMENTARY PROCESS

The Integumentary system comprise the skin and its subsidiaries. These incorporate hair, nails, and a few sorts of organs. The system works in assurance, in the regulation of body temperature, in the discharge of waste materials, in the union of vitamin D3 with the assistance of sunrays, and in the gathering of different jolts recognized as pain, pressure and temperature.

Skin : Skin is the biggest organ in the body possessing just about 2m2 of surface area thickens of 2mm. Skin has 3 fundamental parts. These

are the epidermis, dermis and hypodermis. Epidermis is the external layer of the skin that is made of stratified squamous epithelium. It has no blood supply. Epidermis holds 4-5 strata. These are stratum cornium, lucidium, granulosum, spinosum and basale, Stratum cornium is the external, dead, level, Keratinized and thicker layer.

Stratum lucidium is by stratum cornium. It comprises of level, translucent layers of cells. This stratum found in tough skin just. Stratum granulosum lies simply beneath stratum lucidium. The cells in this layer are currently keratinization.

Stratum spinosum: next down to stratum granulosum. The cells in this stratum have a poly-hydral shape and they are in the methodology of protein amalgamation. Stratum basale rests on the storage room membrane, and it is the last layer of epidermis beside stratum spinosum. Stratum basale together

with stratum spinosum constitute stratum germinativum.

Hair : Hair is made out of Keratinized strings of cells, which creates from the epidermis. Since it emerges from the skin, it is viewed as an extremity of the skin. It blankets the whole body with the exception of the palms, soles, lips, tip of penis, inward lips of vulva and areolas.

Structure of Hair - Hair has two parts, the shaft the part above skin and the root inserted in the skin. Hair comprise epithelial unit masterminded in The more level parcel of the root, found in the hypodermis expands to structure the bulbs. The bulb is made out of the grid of epithelial cells. The bulb pushes in ward along its lowest part to structure a papilla of blood rich connective tissue. Part of the hair follicle is connected with the heap of smooth muscle about part of the way down the follicle. These are arrecter pili muscles. When it contracts in pulls the follicles and its hair to an erect position processing goose knock. Hair develops and when it completes its development sheds. The development rate of hair hinges on upon its position. The quickest development rate happens over the scalp of ladies matured 16 to 24 years. Scalp hair develops 0.4 m.m for every day (a normal scalp hold 125.000 hairs). Hair sheds when it development is finished. Simply before a hair is to be shed, the network unit continuously get dormant and finally bites the dust.

Nail : Nails, for instance hair are changes of the epidermis. They are made of hard keratin. Nails are made out of even, cornified plates on the dorsal surface of the distal portion of the fingers and toe. The proximal part of nail is lunula, which is white in its shade on account of the vessels underneath are secured by thick epithelium. Nail has body and root. The body is the uncovered part and the root is stowed away under the skin. The nail closes with a free edge that shades the tip of the fingers. Epithelial layer coating underneath of the fore-hang nail is hyponychyem. The nail rests on an epithelial layer of skin called nail cot. The thicker layer of skin underneath the nail root is the framework, where new cells are created. Nail develops 0.5 m.m a week. Meager layers of epidermis called eponychium initially blanket the developing nail. Our nail ensures our fingers furthermore toes. It additionally permits grabbing and getting a handle on articles as well we utilize them to scratch.

THE MUSCULAR PROCESS

The term muscle tissue alludes to all the contractile tissues of the body: skeletal, cardiovascular, and smooth muscle. The muscular system, on the other hand, alludes to the skeletal muscle system: the skeletal muscle tissue and connective tissues that cosmetics singular muscle organs, for example, the biceps brachii muscle.

Cardiovascular muscle tissue is placed in the heart and is accordingly recognized part of the cardiovascular system. Smooth muscle tissue of the digestion systems is part of the digestive system, although smooth muscle tissue of the urinary bladder is part of the urinary system et cetera. In this section, we examine just the muscular system. We will perceive how skeletal system produce development and we will portray the foremost skeletal muscles of the human body; their activity and innervation.

Connective Tissue Component : A skeletal muscle is an organ made essentially out of striated muscle cells and connective tissue. Every skeletal muscle has two parts; the connective tissue sheath that stretch out to structure specific structures that support in joining the muscle to bone also the beefy part the tummy or gaster. The augmented specific structure may take the manifestation of a rope, called a tendon; then again, an expansive sheet called an aponeurosis may connect muscles to bones or to different muscles, as in the midriff or over the highest point of the skull. A connective tissue sheath called facia encompasses and divides muscles. Connective tissue additionally reaches out into the muscle and partitions it into various muscle groups (fascicles). There are three connective tissue parts that blanket a skeletal muscle tissue. These are:

1. Epimysium—a connective tissue sheath that encompasses and divides muscle.

2. Perimysium—a connective tissue that encompasses and holds fascicles together.

3. Endomysium—a connective tissue that encompasses each muscle fibre.

Microscopic structures : The muscle bunches are made out of numerous lengthened muscle cells called muscle fibres. Each one muscle fibre is a round and hollow unit holding a few cores found instantly underneath the unit membrane (sarcolemma). The cytoplasm of each muscle fibre (sarcoplasm) is loaded with myofibrils. Each myofibril is a string like structure that reaches out from one closure of the muscle fibre to the next. Myofibrils comprise of two real sorts of protein fibres: actins or slight my filaments, also myosin or thick my filaments.

The actins and myosin my filaments structure quite requested units called sarcomers, which are joined finish to-end to structure the myofibrils. Sarcomere is a structural and utilitarian unit of muscle tissue. The finishes of a sarcomere are a system of protein fibres, which structure the Z-lines when the sarcomere is seen from side. The Z-lines structure an connection site for actins my filaments. The plan of the actin and myosin my filaments in a sarcomere gives the myofibril a joined manifestation since the myofibril shows up darker where the action and myosin my filaments cover. The substituting light (I-band) and dull (A-band) areas of the sarcomers are answerable

for striation (banding example) seen in skeletal muscle cells watched through the microscope.

Sorts of muscle compression: Muscle contractions are considered either isotonic or isometric. In isotonic contractions, the measure of pressure generated by the muscle is consistent throughout constriction, yet the length of the muscle changes; for instance, development of the fingers to make clench hand. In isometric contractions, the length of the muscle does not change, yet the measure of pressure expansions throughout the compression process. Holding the clench hand increasingly hard is an illustration. Most developments are a blend of isometric and isotonic contractions. For case, when shaking hands, the muscles abbreviate some separation (isotonic contractions) and the level of pressure increments (isometric contractions).

Isometric contractions are likewise answerable for muscle tone, the steady pressure handled by muscles of the body for long periods. Muscle tone is answerable for carriage; for instance, holding the back and legs straight, the head held in upright position and the midriff from protruding.

THE NERVOUS PROCESS

None of the body system is equipped for working alone. All are related and cooperate as one unit so that typical conditions inside the body may predominate. Control of the body's billions of cells is proficient for the most part by two correspondence systems: the nervous system and the endocrine system. Both systems transmit information starting with one part of the body then onto the next, yet they destroy it diverse ways. The nervous system transmits information quite quickly by nerve driving forces directed starting with one body area then onto the next.

The endocrine system transmits information all the more gradually by chemicals discharged by ductless organs into blood steam and coursed from organs to different parts of the body. The nervous system serves as the boss arranging org. Conditions both inside and outside the body are continually changing; the motivation behind the nervous system is to react to these inside what's more outer progressions (reputed to be boosts) thus cause the body to adjust to new conditions. It is through the nerve drive sent to the different organs by the nervous system that an individual's interior amicability and the harmony between the individual and nature are upheld. The nervous system has been contrasted with a phone trade, in that the mind and the spinal line go about as exchanging centers and the nerve trunks go about as links for convey messages to and from these centres.

The two sorts of cells found in the nervous system are called neurons or nerve cells and neuroglia, which are particular connective tissue cells. Neurons behavior motivations, whereas neuroglia helps neuron.

Every neuron comprises of three parts: a fundamental part called the neuron unit body, one or additionally expanding projections called dendrites, and one prolonged projection reputed to be an axon. Dendrites are the techniques or projections that transmit motivations to the neuron cell forms, and axons are the forms that transmit motivations far from the neuron cell figures.

Neurons could be ordered structurally and practically. The three sorts of useful order of neurons are consistent with the course in which they transmit motivations. These are: tangible neurons, engine neurons, and interneurons. Tangible neurons transmit driving forces to the spinal rope and mind from all parts of the body. Engine neurons transmit motivations in the inverse course far from the cerebrum and spinal line. They don't direct driving forces to all parts of the body however just to two sorts of tissue-muscle and glandular epithelial tissue. Interneurons behavior motivations from tangible neurons to engine neurons. Tactile neurons are likewise called afferent neurons; engine neurons are called efferent neurons, and interneurons are called central or interfacing neurons.

The unit membrane of an unstimulated (resting) neuron conveys an electric charge. Due to positive and negative particles focused on either side of the membrane, within of the membrane at rest is negative as contrasted and the outside. A nerve drive is a nearby inversion in the charge on the nerve cell membrane that then spreads along the membrane like an electric current. This sudden electrical change in the membrane is called an activity potential. A boost, then, is any compel that can begin an activity potential.

This electric change results from quick movements in sodium and potassium particles over the cell membrane. The inversion happens quite quickly (in under one thousandth of a second) also is accompanied by a quick return of the membrane to its unique state so it might be fortified once more.

A my elinated nerve strand behaviors driving forces more quickly than an unmyelinated strand of the same size in light of the fact that the electrical drive "hops" from hub (space) to hub in the myelin sheath as opposed to voyaging ceaselessly along the strand.

Every neuron is a divide unit, and there is no anatomic association between neurons. How then is it conceivable for neurons to convey? As it were, the way does the axon of one neuron reach the membrane of an alternate neuron? This is refined by the synapse, from a Greek word significance "to

catch." Synapses are purposes of intersection for the transmission of nerve driving forces.

Inside the fanning endings of the axon are little air pockets (vesicles) holding a sort of chemical reputed to be a neurotransmitter. The point when invigorated, the axon discharges its neurotransmitter into the slender crevice, the synaptic separated, between the cells. The neurotransmitter then goes about as a chemical sign to animate the following unit, depicted as the postsynaptic unit. On the appropriating membrane, generally that of a dendrite, now and then an alternate part of the unit, there are extraordinary locales, or receptors, prepared to get and react to particular neurotransmitters. Receptors in the unit membrane impact how or if that unit will react to a given neurotransmitter.

The nervous system overall comprises of two main divisions called the central nervous system and peripheral nervous system. Since the mind and spmailine involve a midline or central area in the body, they are together called the central nervous system or CNS. Additionally, the normal designation for the nerves of the body is the peripheral nervous system or PNS. Utilization of the term peripheral is fitting in light of the fact that nerves reach out to remote or peripheral parts of the body. A subdivision of the peripheral nervous system called the autonomic nervous system (ANS) comprises of structures that direct the body's autonomic or automatic capacities (for instance, the heart rate, the contractions of the stomach, and digestion tracts, and the emission of chemical mixes via organs).

Central Nervous System : The CNS as its name infers, is centrally placed. Its two significant structures, the cerebrum and spinal rope, are found along the midsagittal plane of the body. The mind is ensured in the cranial hole of the skull, and the spinal rope is encompassed in the spinal section. Likewise, defensive membranes called meninges blanket the mind and spinal rope.

Peripheral Nervous System : The nerves associating the mind and the spinal line to other parts pf the body constitutes the peripheral nervous system (PNS). This system incorporates cranial and spinal nerves that join the mind and spinal line, separately, to peripheral structures, for example, the skin surface and the skeletal muscles.

Moreover, different structures in the autonomic nervous system (ANS) are recognized part of the PNS. These unite the cerebrum and spinal string to different organs in the body and to the cardiovascular and smooth muscle in the thorax and belly.

The Autonomic Nervous System : Although the inward organs, for example, the heart, lungs, and stomach hold nerve endings and nerve filaments for directing tactile messages to the mind and rope, a large portion of these motivations don't achieve awareness. These afferent driving forces from the viscera are made as reflex reactions without arriving at the higher focus of the cerebrum; the tangible neurons from the organs are amassed with those that come from the skin and voluntary muscles. Conversely, the efferent neurons, which supply the organs and the automatic muscles, are organized quite uniquely in contrast to those that supply the voluntary muscles. This variety in the area and plan of the instinctive efferent neurons has prompted their arrangement as part of a differentiate division called the autonomic nervous system (ANS). The ANS itself is comprised of sympathetic and parasympathetic divisions.

The autonomic nervous system has many ganglia that serve as relay stations. In these each message is transferred at a synapse from the first neuron to a second one and from there to the muscle or gland cell. This differs from the voluntary (somatic nervous system, in which each motor nerve fiber extends all the way from the spinal cord to the skeletal muscle with no intervening synapse.

CARDIOVASCULAR PROCESS

The cardiovascular system is the transport system of the body by which sustenance, oxygen, water and all different essentials are conveyed to the tissue cells and their waste items are conveyed away. It comprises of three parts:

1. The blood, Which is the liquid in which materials are conveyed to and from the tissue

2. The heart, which is the main thrust which drives the blood

3. The blood vessels, the ways by which the blood voyages to and through the tissues and again to the heart.

The Blood : Blood is considered a connective tissue, since almost 50% of it is made up of cells. Be that as it may, it contrast from other connective tissues in that its cells are not altered in position, rather they move openly in the fluid bit of the blood, the plasma.

Blood is a (thick) liquid that changes in colour from splendid to dull red, contingent upon what amount of oxygen it is convey. Its amount varies with the span of the individual; the normal grown-up male, weighing 70 kg has in the vicinity of 5-6 litres of blood. This volume represents something like 8% of the aggregate body weight. It is conveyed through a shut system of vessels pumped by the heart. The flowing blood is of crucial essentialness in upholding the inner environment in a consistent state (homeaostasis).

The Heart : The heart is a muscular pump that drives the blood through the blood vessels. Somewhat greater than a clench hand, this organ is found between the lungs in the core and a spot to the left on the midline of the body. The significance of the heart

has been distinguished for a long time. The way that its rate of demolishing is influenced by the feelings may be answerable for the exact regular references to the heart in melody and verse. In any case, the essential capacities of the heart and its issue are of additional functional significance to us.

M.d.s frequently allude to the right heart and the left heart. This is since the human heart is truly a twofold pump. The two sides are totally differentiated from one another by a partition called the septum. The upper part of this partition is called Interarrival septum; while the bigger the more level part is called interventricular septum. The septum, for instance the heart divider, comprises generally of myocardium.

Despite the fact that the right and left half of the heart are divided from one another, they cooperate. The blood is crushed through the chambers by a withdrawal of heart muscle starting in the flimsy walled upper chambers, the atria, emulated by a withdrawal of the thick muscle of the more level chambers, the ventricles. This dynamic stage is called systole, and in each one case it is emulated by a resting period regarded as diastole. The withdrawal of the dividers of the atria is finished around then the withdrawal of the ventricles starts. Therefore, the resting stage (diastole) starts in the atria in the meantime as the withdrawal (systole) starts in the ventricles. After the ventricles have exhausted, both chambers are loose for a brief time of time as they load with blood. At that point an alternate beat starts with withdrawal of the ventricles. This succession of heart unwinding and constriction is known as the cardiovascular cycle. Each one cycle takes a normal of 0.8 seconds.

Blood Vessels : The blood vessels, together with the four councils of the heart, from a shut system for the stream of blood; just if there is a damage to some part of the divider of this system does any blood escape. On the premise of capacity, blood vessels may be grouped into three gatherings:

1. Corridors convey blood from the ventricles (pumping chambers) of the heart out to the vessels in organs and tissue. The most modest courses are called arterioles.

2. Veins channel vessels in the tissues and organs and furnish a proportional payback to the heart. The most diminutive veins are the venules.

3. Vessels take into account trades between the blood and body cells, or between the blood and air in the lung tissues. The vessels associate the arterioles and venules.

Corridors, veins and vessels vary in structure. Three layers alternately layers are found in both veins and veins. The external most layer is known as the tunica externa. Note smooth muscle is found in the center layer or tunica media of courses also veins. Notwithstanding, the muscle layer is much thicker in courses than in veins. Why is this paramount? Since the thicker muscle layer in the course divider has the capacity to oppose incredible pressures created by ventricular systole. In veins, the tunica average assumes a discriminating part in supporting blood pressure and regulating blood appropriation in the body. This is a smooth muscle, so it is regulated by the autonomic nervous system.

A slim layer of flexible and white stringy tissue blankets an inward layer of endothelial cells called the tunica interna in courses also veins. The tunica interna is really a solitary layer of squamous epithelial cells called endothelium that lines the internal surface of the whole circulatory system.

As should be obvious, veins have an one of a kind structural offer not show in conduits. They are provided with oneway valves that forestall the reverse of blood. The point when a surgeon cuts into the body, just veins, arterioles, veins, and venules could be seen. Vessels can't be seen since they are microscopic. The most vital structural characteristic of vessels is their great thinness−only one layer of level, endothelial cells forms the narrow membrane. Rather than three layers or layers, the narrow divider is made out of just one−the tunica interna. Substances, for example, glucose, oxygen, also squanders can rapidly pass through it on their approach to or from the cells. Smooth muscle cells that are called precapillary sphincters watch the passageway to the fine and figure out into which slender blood will stream.

FLUID AND ELECTROLYTE STABILITY

The composition of body fluids is an important factor in homeostasis. The volume or chemical makeup of these fluids whenever deviates even slightly from normal, disease results. The constancy of body fluids is maintained in ways that include the following:

1. The thirst mechanism, which maintains the volume of water at a constant level.

2. Kidney activity, which regulates the volume and composition of body fluids.

3. Hormones, which serve to regulate fluid volume and electrolytes.

4. Regulators of PH, including buffers, respiration and kidney function.

The largest single constituent of the body is water, which is 60 % of the total body weight. The correct proportion of water and electrolytes in the water and

proper acid base balance are necessary for life to exist. Loss of 10% of total body water usually produce lethargy, fever and dryness on mucous membrane and a 20% loss is fatal.

Electrolytes are compounds that dissociate in to ions when in solutions. Acids, bases & salts are electrolytes. Most electrolytes are dissolved in the body fluids. However, some are found attached to proteins and other places. The most physiologically important electrolytes are the cations (Na^{+}, k^{+}, ca^{2+} mg^{2+} and H^{+}) and anions bicarbonates ($HCO3^{-}$), chloride (cl^{-}) phosphate ($HPO4^{2}$) & sulfate ($SO4^{2-}$).

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