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Paper physiology

Q1 ANS: **Pituitary Gland:**  
The **pituitary gland** is a small pea-sized **gland** that plays a major role in regulating vital body functions and general wellbeing. It is referred to as the body's 'master **gland**' because it controls the activity of most other hormone-secreting **glands**. **Pituitary gland.**

**Explain Different Lobes**

Anatomy of the Pituitary Gland

The pituitary has two lobes, the anterior and the posterior lobe. Each of the two lobes of the pituitary gland contains different types of cells and produces different types of hormones. The posterior lobe produces two hormones, Vasco reason and oxytocin. These hormones are released when the hypothalamus.

Vasopressin is also known as antidiuretic hormone (ADH). It acts on the kidney to conserve water and is important in fluid and electrolyte balance. Oxytocin stimulates the contraction of the smooth muscles of the uterus, which is important during childbirth. Oxytocin also contracts the smooth muscle of the breast for The anterior lobe makes up about 80% of the pituitary gland. It regulates growth, metabolism, and reproduction through the hormones that it produces. The production of these hormones is either stimulated or inhibited by chemical messages sent from the hypothalamus to the pituitary. human growth hormone (HGH or GH) l.Human growth hormone (HGH or GH). Thyroid-stimulating hormone. (TSH) adrenocorticotrophin hormone (ATCH). follicle-stimulating hormone (FSH). luteinizing hormone (LH). Prolactin.

Q3:

ANS: **Muscle tissue**

Muscle tissue is a soft tissue that composes muscles in animal bodies, and gives rise to muscles' ability to contract. This is opposed to other components or tissues in muscle such as tendons or perimysium. It is formed during embryonic development through a process known as my genesis.

**Function of Muscle Tissue**

Muscles are the only tissue in the body that has the ability to contract and therefore move the other parts of the body. Related to the function of movement is the muscular system's second function: the maintenance of posture and body.

**Muscle Types**

In the body, there are three types of muscle: skeletal (striated), smooth, and cardiac.

**Skeletal Muscle**

Skeletal muscle, attached to bones, is responsible for skeletal movements. The peripheral portion of the central nervous system (CNS) controls the skeletal muscles. Thus, these muscles are under conscious, or voluntary, control. The basic unit is the muscle

fiber with many nuclei. These muscle fibers are striated (having transverse streaks) and each acts independently of neighboring muscle fibers.

**Smooth Muscle**

Smooth muscle, found in the walls of the hollow internal organs such as blood vessels, the gastrointestinal tract, bladder, and uterus, is under.

Control of the autonomic nervous system. Smooth muscle cannot be controlled consciously and thus acts involuntarily. The non-striated (smooth) muscle cell is spindle shaped and has one central nucleus. Smooth muscle contracts slowly and rhythmically.

**Cardiac Muscle**

Cardiac muscle, found in the walls of the heart, is also under control of the autonomic nervous system. The cardiac muscle cell has one central nucleus, like smooth muscle, but it also is striated, like skeletal muscle. The cardiac muscle cell is rectangular in shape. The contraction of cardiac muscle is involuntary, strong, and rhythmical. Smooth and cardiac muscle will be discussed in detail with represent their appropriate systems. This Back mainly covers the skeletal to Top system.

Q4:

# ANS: **Breathing Cycle**

* The Breathing Cycle is a description of the changes in pressure, lung volume, and airflow that occur during a single cycle of breathing. The major pressure gradient which controls expansion and contraction of the lung during the breathing cycle is that between the alveolar air and the interoperable space; consequently, we will be focusing on this gradient. The breathing cycle can be divided into three basic stages including rest, inspiration, and expiration which are discussed separately below.
* During rest there is no net movement of air into our out of the lungs and the lung volume is equivalent to the Functional Residual Capacity. Given that there is no net movement of air it is clear that the air pressure in the alveoli is equivalent to that of atmospheric pressure. However, the intrapleural pressure in a resting lung is roughly -5 cm H2O, that is five centimeters of water, below that of atmospheric pressure at rest. The negative intrapleural pressure is a result of the opposing forces of the lung and chest wall
* As explained in [Integrated Pulmonary Compliance](http://www.pathwaymedicine.org/Integrated-Pulmonary-Compliance" \o "Integrated Pulmonary Compliance), the lungs displays strong recoiling forces at FRC whereas the chest wall displays a tendency to spring outward. These opposing forces generate a negative pressure within the intrapleural space which is responsible for maintaining the lungs in an inflated state while at rest. If the negative intrapleural pressure were eliminated, say by raising it to that of atmospheric pressure as might occur in a pneumothorax, the lungs would collapse under their own recoiling force.
* During inspiration there is a net movement of air into the lungs and the volume of the lungs expands by the tidal volume above that of the Functional Residual Capacity (FRC). Given the inward movement of air, it is clear that the alveolar pressure must be slightly negative, thus dipping below that of atmospheric pressure and in consequence actuating inward airflow. During inspiration, the intrapleural pressure decreases also, dipping to -7 or -8 cm H2O below atmospheric pressure. This more negative intrapleural pressure is the result of the increasing recoiling force exerted by the lung as it expands.
* During expiration there is a net movement of air out of the expanded lungs and the volume of the lungs declines by the tidal volume back to the FRC. Given the outward movement of air, it is clear that the alveolar pressure must be slightly positive, thus increasing above that of atmospheric pressure and in consequence actuating outward airflow. During expiration, the elastic recoil of the lung declines as it contracts; consequently, the intrapleural pressure returns to its previous value of -5 cm H2O, thus reestablishing the original FRC lung volume.

Q5:

**Ans: Functions of the Integumentary System**

Each layer of the skin contributes to the overall function within the body. The most obvious role of the skin is to protect the body from external aggression.

**Barrier Function**

While the skin may seem like a delicate organ, its stupendous role becomes apparent after an injury removes the skin from a region. In fact, preventing infections and regulating body temperature are major challenges in burn victims. Layers of tightly bound, heavily keratinized, anucleated cells provide the first line of defense by forming a physical barrier. The mildly acidic nature of skin secretions also contributes towards preventing pathogenic colonization. Lipids secreted by the skin are another chemical barrier, preventing the loss of water, especially in dry or hot environments. Alternatively, the skin also prevents the body from bloating in an hypotonic environment. Finally, the integumentary system contains resident immune cells that are adept at clearing minor infections.

**Thermoregulation**

Sweat glands are necessary for thermoregulation, whether it is while working up a sweat during exercise or breaking a fever. Sweat allows the body to cool down. On the other hand, goosebumps arising from the contraction of arrector pili muscles can keep the body warm, especially in hairy mammals.

**Excretion**

Sweat and sebum also have an excretory role for water and fat soluble metabolites respectively. For instance, excess vitamin B from supplements is removed through urine and sweat.

**Sensation and Chemical Synthesis**

Nerve endings on the skin help in sensing touch, pressure, heat, cold as well as the nature and intensity of damaging stimuli. The skin is also necessary for the production of melanin that prevents damage from UV rays – whether it is a sunburn or skin cancer. Upon exposure to the sun, in addition to melanin production, the skin also synthesizes vitamin D that contributes to bone health and enhances bone density.

**Diseases of the Integumentary System**

Diseases of the integumentary system can arise from pathogenic infections, injury due to radiation, chemicals or from genetic disorders.

The most common bacterial infection of the skin is probably acne. Technically known as Acne vulgaris, it is usually a side effect of hyperactive sebaceous glands. This is particularly true during puberty, when the pores and glands of the skin can get clogged, leading to bacterial growth and infection. Some of these can be a part of the normal flora of healthy skin, while others, like Staphylococci can piggyback on an existing infection. While acne only causes mild discomfort, at the other end of the spectrum are diseases like necrotizing fasciitis, which can be deadly even with appropriate treatment.

Fungal infections of the skin are common especially in those regions where sweat and sebum collect for long periods of time, providing a rich environment for the growth of fungi. These could be along the waistband of trousers, the elastic regions in tight dresses or underclothes, and regions between the toes, when covered by unwashed socks or damp shoes. Fungal infections include athletes foot, yeast infections and ringworm infections. They are usually seen with ring-shaped or scaly rashes, redness, itching, blisters or with the thickening of skin. Dandruff is considered as both a bacterial and fungal infection of the scalp.

One of the most common viral infections is herpes. Herpes can spread through direct contact with body fluids. There are usually periods of remission, though even asymptomatic patients can transmit the virus. ‘Cold sores’ arise from oral herpes, forming blisters around the mouth.

The skin can also be subjected to genetic disorders like psoriasis or albinism. Psoriasis is an autoimmune disorder and albinism arises from a complete lack of pigments on the skin.

Finally, prolonged exposure to UV rays can result in sunburns or even skin cancer, especially in people with low melanin content in their skin.

**Interesting Facts**

Rhinoceros horns are made entirely of keratin, while most animal horns have a bony core. Calcium deposits in the core make the horn strong. Surprisingly, the term ‘keratin’ itself arises from the Greek word for ‘horn’.

Skin that has no hair is called glabrous skin. This is the skin that becomes crinkled when you spend too much time in the swimming pool.

Goosebumps are caused by the contraction of small muscles called arrestor pili. Heavy metals like mercury, arsenic and cadmium can accumulate in the hair and nails. Having a large amount of Vitamin A supplements can turn your skin yellow or even orange.

Q2

**Ans: skeleton have two parts**

**Axial skeleton**  it consist of skull vertebral column rib cage and sternum

**Appendicular skeleton** it consist of pelvic girdle

**Difference between appendicular skeleton and axial skeleton**

**AXIAL SKELETON**

Part of the skeleton that

consists of the bones of the head and trunk of a

vertebrate

Central axis of the human skeleton

Composed of skull, ossicles of the middle ear, vertebral column consisting of a total of 80 bones, hyoid, rib cage, and sternum

Made up of 80 bones

Supports the upright position and protects the internal organs

**APPENDICULAR SKELETON**

Portion of the skeleton of vertebrates consisting of the bones that support the appendages

Consists of appendages connected to the axial

skeleton

Composed of pectoral girdles, arms, forearms, hands, pelvis, legs, feet, and ankles

Made up of 126 bones

Aid in the movement of the body