

Functions and Anatomy of Human Body - GK Notes in PDF

A number of complex processes and systems together form the human body. Zillions of cells and many organs work in coordination in the body to enable us to perform everyday functions. The human anatomy can be a complicated subject to revise and remember. Therefore, we have come up with this list containing all the facts related to the human body. This list will help you memorize all the important body parts and their functions, for your exam. Make sure you download this list as a PDF to keep it within reach during your preparation.

Organs and Organ Systems of the Human Body

Musculoskeletal system

Human skeleton

- 270 bones at birth, 206 in adults.
- Longest bone – Femur (thighbone).
- Smallest bone – Stapes (in the ear).
- Other bones – Humerus (upper arm), Fibula (lower leg), Tibia (shinbone).

Joints

- Connection between bones in the body.

Ligaments

- Connective tissue between bones.
- Made of collagen.

Muscular system

- Skeletal, smooth and cardiac muscles.
- Largest muscle – Gluteus Maximus (buttock).

- Smallest muscle – Stapedius (in the ear).

Tendons

- Connective tissue between muscle and bone.
- Made of collagen.

Digestive system

Mouth

- Lower Jawbone is called mandible, upper is called maxilla.
- First portion of the alimentary canal.

Teeth

- 20 baby (or milk) teeth, 32 adult (permanent) teeth.
- Incisors (8), Canines (4), Premolars or Bicuspid (8), Molars (12).
- Made of enamel.

Salivary glands

- Exocrine glands (glands with ducts).
- Produce saliva from amylase etc.
- Parotid glands, Submandibular glands, Sublingual glands, Von Ebner glands etc.

Pharynx

- Nasopharynx, Oropharynx, Laryngopharynx.
- Important part of Digestive system, Respiratory System, Vocalization

Esophagus

- Aka Food pipe or gullet.
- During swallowing, epiglottis tilts backwards to prevent food from going into lungs.

Stomach

- Secretes digestive enzymes.
- Pyloric Sphincter controls passage of partially digested food into duodenum.

Small intestine

- Three parts – Duodenum, Jejunum, Ileum
- Duodenum receives bile and pancreatic juice.
- Average length in adult human male is 6.9 m.

Large intestine

- Also known as bowels.
- Average length is about 1.5 m.
- Parts – Cecum, Ascending Colon, Transverse Colon, Descending Colon, Sigmoid Colon, Rectum, Anal Canal.

Liver

- Largest internal organ in human body.
- Largest gland in human body.
- Secretes the enzyme – bile.
- Located in upper right quadrant of abdominal cavity.
- Has four lobes.
- Can be fractured. Can be regenerated from part.

Gallbladder

- Stores bile before being released into small intestine.
- Can survive without gall bladder.
- Three parts – fundus, body, neck.

Pancreas

- An endocrine gland that produces several important hormones.
- Chief among these hormones are insulin, glucagon, somatostatin, pancreatic polypeptide.

- It also secretes digestive enzymes called pancreatic juices.
- Insulin is produced from near the area called Islets of Langerhans).

Respiratory system

Nasal cavity

- Aka nasal fossa.
- Divided into two by vertical fin called nasal septum.

Larynx

- Commonly called Voice box.
- Involved in protecting trachea, manipulating pitch and volume of sound.
- Thyroid Cartilage is called Adam's apple.

Trachea

- Aka Windpipe.
- Cartilaginous tube that connects larynx and pharynx to the lungs.

Bronchi

- Airway in respiratory tract that allows air into lungs.
- Primary bronchus – right and left.
- These branch into smaller secondary and tertiary bronchi.
- No gas exchange takes place in bronchi.

Lungs

- Primary respiratory organs.
- Two lungs (left and right) – each divided into two lobes.
- They extract oxygen from atmosphere and transfer to the bloodstream. They release carbon dioxide from bloodstream into atmosphere.
- Right lung is bigger than left lung.
- Protected by the ribcage.

Diaphragm

- Primary muscle that drives breathing.
- Separates thoracic cavity (containing heart and lungs) from abdominal cavity.

Urinary system

Kidneys

- Regulates balance of electrolytes in blood.
- Also maintains pH homeostasis.
- Also removes excessive organic molecules from blood. Thus it removes waste products of metabolism.
- Also produce hormones – renin, calcitriol and erythropoietin.
- Two bean shaped organs made up of cells called nephrons.

Ureters

- Tubes that take urine from kidneys to bladder.

Bladder

- Hollow muscle that collects urine from kidneys before urination.
- Typical capacity of bladder is between 300 and 500 ml.

Urethra

- Tube that connects urinary bladder to urinary meatus.
- It helps in removal of fluids from the body.

Reproductive organs - Female reproductive system

Ovaries

- Produces and periodically releases eggs in the female body.
- They are both gonads and endocrine glands.
- They secrete estrogen, testosterone, progesterone.

Fallopian tubes

- Aka Uterine tubes.

- They allow passage of eggs from the ovaries to the uterus.

Uterus

- Aka womb.
- It is a hormone-responsive reproductive sex organ in females.
- One end connects to the fallopian tubes. The other end, the cervix, opens into the vagina.
- It is within the uterus that the egg is fertilized, and the fetus is developed.

Vagina

- It is the opening of the female genital tract.
- It allows for sexual intercourse, childbirth and channels menstrual flow.

Vulva

- This is the external genital organ of the woman.

Clitoris

- It is a female sex organ.

Placenta

- Aka afterbirth.
- Organ that connects developing foetus to the uterine wall.
- It allows for nutrient uptake, thermoregulation to the foetus, waste elimination and gas exchange via mother's blood supply.

Reproductive organs - Male reproductive system

Testes

- They are the male gonads producing sperms.
- They are also endocrine glands producing androgens, primarily testosterone.
- Typically there are two.

Prostate

- It is an exocrine gland in males.
- It produces a white fluid that constitutes 30% of the seminal fluid.

Penis

- It is the external male sexual organ.
- It also serves as the urinal duct.

Scrotum

- It is the male reproductive organ.
- It consists of a pair of suspended sacs.

Endocrine glands

Pituitary gland

- Aka hypophysis.
- It is an endocrine gland, the size of a pea.
- It is found at the base of the brain.
- It secretes hormones that regulate growth, blood pressure, certain functions of sex organs, thyroid glands, temperature regulation, pain relief, metabolism, and some aspects of pregnancy, childbirth nursing etc.

Pineal gland

- Aka conarium or epiphysis cerebri.
- Small endocrine gland found near the center of the brain, between the two hemispheres.
- It resembles a tiny pine cone.

Thyroid gland

- One of the largest endocrine glands in the body.
- It consists of two connected lobes.
- It is found in the neck.

- Controls rate of use of energy sources, protein synthesis, and controls body's sensitivity to other hormones.
- They help regulate growth and rate of function of many other systems in the body.
- T₃ and T₄ are synthesized from iodine and tyrosine.
- It also produces calcitonin which plays a role in calcium homeostasis.
- Hormonal output is regulated by thyroid stimulating hormone (TSH).

Parathyroid glands

- Small endocrine glands in the neck.
- It produces parathyroid hormone.

Adrenal glands

- Aka suprarenal glands.
- Endocrine glands that produce many hormones.
- These include adrenaline and the steroids cortisol and aldosterone.
- They are found above the kidneys.

Circulatory system - Cardiovascular system

Heart

- Muscular organ that pumps blood through blood vessels to entire body.
- Divided into 4 chambers – Left atrium (top), right atrium (top), left ventricle (bottom), right ventricle (bottom).
- In healthy heart, blood flows one way through heart due to heart valves, which prevent backflow.
- Enclosed by a protective sac called pericardium.
- Wall of heart made up of – epicardium, myocardium, endocardium.
- Blood low in oxygen enters right atrium from superior and inferior venae cavae.
- From here it passes to right ventricle.
- From here it is sent to the lungs, where it receives oxygen and gives off CO₂.

- Oxygenated blood returns to left atrium and passes to left ventricle.
- From here it leaves heart through aorta.
- Heart is a fist-sized organ that is placed in the middle of the chest cavity.
- It is slightly offset to the left. The left heart is stronger so heartbeats felt more strongly on the left.

Arteries

- Blood vessels that carry blood away from heart.
- Most carry oxygenated blood.
- Exceptions are pulmonary and umbilical arteries.

Veins

- Blood vessels that carry blood towards the heart.
- Most carry deoxygenated blood from tissues.
- Exceptions are pulmonary and umbilical veins.
- Less muscular than arteries and closer to skin.
- Valves in veins prevent backflow.

Capillaries

- Smallest of body's blood vessels.
- Make up microcirculation.
- They connect arterioles and venules.
- Help enable exchange of O₂, CO₂, other nutrients and waste substances between blood and tissues.
- Lymph capillaries drain lymph from lymph vessels.

Circulatory system - Lymphatic system

Lymphatic vessel

- Thin walled, valved structures that carry lymph.
- Lymph is a fluid that lies between body tissues.

Lymph node

- Oval or kidney shaped organ.
- Present at multiple locations throughout body including armpits, neck and groin.
- Important for proper functioning of immune system.
- Act as filters for foreign particles and cancer cells.

Bone marrow

- Flexible tissue in the interior of bones.
- Red blood cells produced by bone marrow in heads of long bones.
- Bone marrow is a key component of the lymphatic system.
- It produces lymphocytes that supports the body's immune system.

Thymus

- Specialized primary lymphoid organ of immune system.
- Within thymus, T cells or T lymphocytes mature.
- These are key to adaptive immune system.
- Consists of two identical lobes located in front of the heart.

Spleen

- Similar in structure to large lymph node.
- Acts as a blood filter.
- Removes old red blood cells and holds a reserve of blood.
- It recycles iron.
- It also synthesizes antibodies in its white pulp.

Nervous system

Brain

- Main organ of human central nervous system.
- Located in head, protected by skull.

- Composed neurons, glial cells and blood vessels.
- Divided into three parts – forebrain, midbrain and hindbrain.
- Dominant feature of human brain is the wrinkling of the cerebral cortex. The cerebral cortex is so large that it overshadows all other parts of the human brain.
- Three parts of cerebral cortex – cerebrum (forebrain), cerebellum (hindbrain), and brainstem.
- There are two hemispheres in the brain – left and right.
- The mind is an emergent property of the brain.

The brainstem

- Posterior part of the brain.
- Consists of – Midbrain, Pons, and Medulla Oblongata.
- Medulla Oblongata is responsible for involuntary functions like sneezing, breathing, heart rate, blood pressure etc.
- Pons has a role in sleep and dreams. Also deals with swallowing, bladder control, equilibrium, hearing, taste, eye movement, facial expressions and posture.
- Midbrain is associated with vision, hearing, motor control, sleep/wake, alertness, temperature regulation.

Cerebellum

- Important in motor control, cognitive functions like language and attention.
- Also regulates fear and pleasure responses.

Spinal cord

- Long, thin, tubular bundle of nervous tissue and support cells.
- Extends from brainstem to pelvis.
- Brain and spinal cord together make up central nervous system.

Nerves

- Enclosed, cable-like bundles of axons (nerve fibres).
- Part of the peripheral nervous system.
- Provides pathway for electrochemical nerve impulses to and from peripheral organs.
- Categorized in three groups based on direction of signals – afferent nerves (from sensory neurons to central nervous system), efferent nerves (from CNS to muscle and glands) and mixed nerves (contains both signals).
- Categorized in two groups based on where they connect to CNS – spinal nerves (connect to spinal cord), and cranial nerves (connect directly to brain).

Sensory organs

Eye

- Eye is a sense organ.
- Contains rod cells (for light perception) and cone cells (for colour perception).
- Made of three coats enclosing three transparent structures.
- Outermost layer composed of cornea and sclera.
- Middle layer consists of choroid, ciliary body and iris.
- Innermost layer is the retina, a light sensitive layer of tissue.
- Within these coats are the aqueous humour (clear fluid), the vitreous body (clear jelly), and the flexible lens.
- The lens is suspended to the ciliary body by the suspensory ligament (Zonule of Zinn).
- The cornea is the transparent front part of the eye that covers the iris and pupil. It refracts light.
- The iris controls the size and diameter of the pupil, which is a hole that lets light in.

Ear

- Ear is an organ for hearing and balance.
- Consists of three parts – outer ear, middle ear and inner ear.

- Outer ear consists of auricle (visible part of the ear) and ear canal. It gathers and focusses sound energy on to the eardrum.
- Ear drum is a membrane that separates external ear from middle ear.
- Middle ear contains three ossicles which transfer vibrations from ear drum to inner ear.
- Inner ear is a bony labyrinth. It has two main functional parts – cochlea and vestibular system.

Olfactory epithelium

- Specialized epithelial tissue in the nasal cavity.
- Involved in smell and detecting odors.

Tongue

- Taste receptors or taste buds on different parts of the tongue.
- Taste buds are also found in the soft palate, upper esophagus, cheek and epiglottis.
- They are involved in detecting five elements of taste perception – salty, sour, bitter, sweet and umami.

Integumentary system

Mammary glands

- It is an exocrine gland that produces milk.

Skin

- Largest organ of the integumentary system.
- Contains pigment melanin that gives skin its colour.
- Composed of three primary layers – epidermis, dermis and hypodermis.

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