Original Article

# Anthropotomy: The Study Of Human Body (Human Anatomy)

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## Abstract

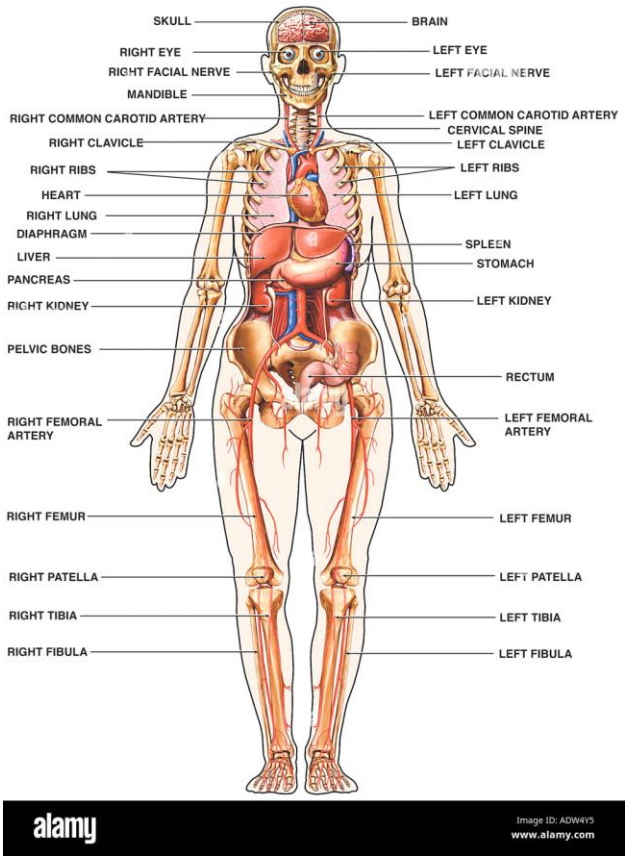
The science of anatomy examines the composition, form, and dimensions of the human body. With the aid of the urinary organs such as. The urinary system cleanses waste from the body utilizing the kidneys, ureters, urinary bladder, and urethra.The science of anatomy examines the composition, form, and dimensions of the human body. With the aid of the urinary organs such as The urinary system, which includes the kidneys, ureters, urinary bladder, and urethra, eliminates waste from the body.The kidney is the main organ of the urinary system and is responsible for separating waste from blood. The nephron, a component of the kidneys that produces urine by clearing waste from the blood, is the organ's functional unit. The ureter is the tube that transports urine through the kidneys to the bladder. The temporary urine storage compartment is the urinary bladder. Urine is transported from the body by the urethra. Surgical anatomy is the study of the shape and organisation of the cells that make up in relation to surgery. Surgeons are able to keep current on the most modern procedures and uphold a high level of practise because to the use of anatomy in surgical diagnosis, treatment, and dissection.An area of biology known as anatomy examines the skeletal, muscular and skin biology of people. To identify human remains, forensic anatomy combines this knowledge with forensic science methods. The study of the composition and arrangement of the neural system is known as neuro-anatomy.In contrast to animals with radial symmetry, animals with bilateral symmetry have distinct, separated brain systems, whose nervous system is made up of a diffused matrix of cells. Hence, their neuro-anatomy is better known. The kidney is referred to as a "renal." Renal failure, for instance, refers to kidney disease. Similar issues include kidney failure, kidney disease and food, kidney failure diagnostics, renal scans, and kidney transplants.

**KEYWORDS** Human Anatomy, the elements of the urinary system, kidney anatomy, the structure of nephron, cortex and renal pyramids, positioning and design of ureter, bladder and urethra, surgical anatomy, forensic anatomy, clinical anatomy, renal anatomy, anatomy education and renal vascular anatomy.

## INTRODUCTION

Billions of cells make up the human body, which is a vital component of life. By adding up the cell counts of all the body's organs and cell kinds, it was estimated that there are about 30-37 trillion cells in an adult. The same number of non-human cells and multicellular creatures, which are found in the digestive system and on the skin, are also housed within the body. Not every component of the body is created from cells. The adult human body weighs 70 kg, and the extracellular matrix that surrounds cells is made up of proteins like collagen. Approximately 50 kg of non-human cells, such as bone and connective tissue, make up the extracellular matrix. Human anatomy identifies and describes the structure of the body. It is an important branch of medical science [1]. The study of anatomy has become essential to the visual arts. In order to accurately depict someone's figure in a drawing, painting, or other

medium, it is vital to understand how bones and muscles function and change with movement. To adequately depict the physical body anatomically, several publications are written. Old master architect sought to improve his craft by a deeper comprehension of human anatomy. He advanced each human anatomical feature and its artistic depiction inside the method. The study of the human body's structure is known as anatomy. The phrase was once used without qualification and is occasionally used in reference to human anatomy. The phrase anatomy, which is derived from the Greek words and which means "up" and tome, which means "a cutting" is where the word indirectly originates. Videos from the Human Anatomy Education Channel, which focus on applicable elements of anatomy such asTeaching in the classroom is supported by cross-sectional, imaging, surgical, clinical, developmental, and surface anatomy.The variety of instructional tools and methods utilized in anatomy education with the goal of making recommendations for the most effective teaching methods in this field. The best ways to impart anatomical information are hotly contested. For safe clinical treatments, competent clinicians, especially surgeons, need a thorough knowledge of anatomy. There is a concern that medical students will not be adequately prepared for clerk ships and teaching hospitals because of the students' very little contact to anatomy throughout medical experience.




Human anatomy and physiology.

## BACKGROUND

The earliest and most significant of all medical sciences is anatomy. In ancient India, the primary sources of anatomical knowledge came from ritual slaughter, haphazard discoveries of incorrectly buried dead, and physician inspections of patients. [1] Cave paintings with vital places identified that, if hit, might have murdered the animals are visible in archaeological discoveries from the Indus Valley civilization period. This is unequivocal proof of the earliest surface anatomy lectures. The Vedas called the heart a "Lotus with nine gates," which is a fairly accurate description of the contemporary heart. The heart, which resembles a lotus bud when held with the apex facing upward, has nine apertures in total—three in the night atrium, four in the left atrium, and one in each of the right and left ventricles. The Vedas,

which predates the invention of the microscope, contains an accurate description of the embryo. It is very astonishing because it accords practically exactly with our current understanding of embryology. For instance, the Upanishads state that the embryo develops into a vesicle called "Budbuda" seven nights after sexual activity. The term "blastocyst" today refers to a vesicular embryo that is seven days old. Anatomy has so bravely ascended the stages of time in India, being taught and practiced from the pre-Vedic period to the present of online education on computers, and it is certain to continue to make even larger advances in the future. [2]

## Urinary System

The urinary system is made up of the kidneys, ureters, bladder, and urethra. The kidneys filter the blood to eliminate waste before producing urine.The urinary tract, which is made up of the ureters, urinary bladder, and urethra, functions as an excretory system to extract urine from the kidneys, collect it, and then release it during urination. The urinary system monitors the homeostasis of water, ions, pH, blood pressure, calcium, and red blood cell levels in the bloodstream in addition to purifying and eliminating wastes from the body. As a result, there are numerous kidney disorders, such as chronic and acute kidney diseases, glomerulonephritis and pyelonephritis, kidney and bladder tumors, kidney stones, and renal disease. [3]

The group of organs in the body that filters excess substances and separates substances from the blood is known as the renal structure, or urine system. This kidney design's objectives include removing wastes from the body, limiting blood volume and force, boosting levels of electrolytes and metabolites, and controlling blood ph. Although the human excretory or urinary structure shares certain similarities with those of other mammalian species, it has its own unique composition and functional characteristics. The words excretory and urinary emphasize the structure's removal function. However, the kidneys actively store certain compounds that are just as vital to survival as others that are eliminated within the body. [4]

## KIDNEY ANATOMY

The abdominal cavity's rear wall is home to the kidneys, a pair of bean-shaped organs. They are also in charge of eliminating toxins that can harm the kidneys and filtering out unwanted products from the body. The glomerulus, a group of filters found inside your bladder, is another way that the kidneys remove blood from your body. The kidneys also function as a glomerulus, filtering your body's blood using your own urine. By filtering them through a process known as filtration, this filter helps you get rid of all the toxic elements from your body. It is crucial to pass via the kidneys when you have bowel movement issues. The function of these kidney pairs is to filter waste products from the body. [5]

The location of the kidneys is referred to as retroperitoneal because the right side of the liver is substantially larger than the left side.As a result, the right kidney is kind of lower than the left.The location of the kidneys differs from that of other organs. They rub against the back muscles and are posterior to the peritoneum. Both kidneys are maintained in place by adipose tissues, which also shield them from harm or injury. [6] Our kidneys filter out uremic poisons, extra ions, and compounds from the blood in addition to metabolic wastes to create urine.

## IMPORTANT PARTS OF THE KIDNEY

NEPHRON:

The structural and operational units of the kidneys, or nephrons, number roughly 1.3 million per kidney per individual. They are in charge of removing extra water from the blood and releasing it into the body through filtration. Filtration is part of this process, which removes pollutants from moisture to guard against sickness and other issues. By eliminating them through body fluids, dangerous compounds are removed from the blood. Utilizing the kidneys, eliminating also purges harmful substances from the body. Rejuvenation is the process by which the kidneys operate and heal damaged cells.[7]

The two essential parts of a nephron in the kidneys are corpuscles and tubules. Each component carries a sizable amount of fluid, albeit the quantity and type of fluid vary. A nephron's size and shape will depend on how much fluid it is used for.[8,9]

The proximal convoluted tubule, the loop of Henle, and the distal convoluted tubule are the three components of these nephrons, which consist of two strongly coiled sections that are divided by a U-shaped curve that resembles a hairpin.

BOWMANS CAPSULES:

The glomerular capillary loops are encircled by Bowman's capsule, which also filters the blood leaving the capillaries. Bowman's capsule, which also serves a specific support by allowing filtrate to enter the nephron and travel to the proximal convoluted tubule, creates a urinary gap.Blood's liquids and solutes must travel through several layers before reaching Bowman's gap in the glomerular capillaries, where they are transformed into filtrate for passage into the nephron lumen.

The endothelial layer of the capillaries, which is made up of perforated endothelial cells, is where the initial stage of filtration takes place.

[8] These 60–80 nm wide fenestrations, or slits between endothelial cells, prevent the passage of anything larger than this through them. [5] [8] [7]. The semi permeable endothelium also filters according to shape. The fenestrated endothelium filters by size and also contains negative charges that preferentially prevent negatively charged molecules from entering Bowman's space. [8][9][10]

The glomerular basement membrane is the next stop for the filtrate (GBM). The GBM is made up of three layers: the lamina rare external, the lamina dense, and the lamina rare internal, which are arranged from the path of the capillaries approaching Bowman's capsule. The glomerulus's mesangial cells contribute to the formation and up keep of the GBM as well as the fusion of capillary loops. [11][8]

CORTEX:

The outermost renal tissue inside the renal capsule is called the cortex. Additionally, it has a little paler color than the kidney's other regions. It houses the proximal convoluted tubules (P.C.T.) and distal convoluted tubules in addition to the renal corpuscles (D.C.T.). It penetrates the renal medulla, the inner tissue that divides the kidney into renal pyramids, which are triangular sections.

THE RENAL PYRAMIDS:

The collecting ducts and Henle loops of each kidney tubule make up the renal pyramids. They open at the crest and renal papilla of each renal pyramid.[15] The structure known as the minor calyx is where the urine produced inside the pyramid is collected. A major calyx was formed by the union of a few lesser calyces. [6]To get to the renal pelvis, urine must pass through the important calyces. By the intersection of all main calyces, the pelvis resembles a funnel-shaped collecting structure. From the kidneys, it transports urine to the ureter.

## URETERS

The ureters are a pair of tubes that carry urine from the kidneys to the bladder. The ureters are parallel to the spinal column and range in length from 25 to 30 cm on each side of the body. Urine is carried toward the urinary bladder by gravity and the peristalsis of the smooth muscle tissue in the ureter walls. The ureter vesicle valves shut up the aperture of the bladder where the tips of the ureters slightly extend into the bladder. This valves prevent urine from returning to the kidneys. They are situated in the upper back, lower abdomen, and belly. The kidneys, which are found at the base of each kidney, are in charge of removing waste from the ureter. It is composed of two layers or portions, like the bladder of an inner tube. On both sides and an outside tube are the ureters. [13]The inner tube is made up of a tiny tube that connects to a small duct to transport urine from the bladder into an arc.[9]

## URINARY BLADDER

The pouch hollow structure known as the urinary bladder is responsible with temporarily storing urine. In order to store pee, the walls of the urinary bladder relax and contract. When the urinary bladder flattens to discharge urine through the urethra, it contracts, and when it expands to store urine, it relaxes. There are three levels to it: the serosa, adventitia, and intracellular fat. [14]

The bladder's outer layer is known as serosa, a very thin membrane. A portion of the bladder where there is no serosa is covered by a loose connective tissue called adventitia. The layer of fat called periuresical fat covers the bladder. The kidneys are part of the urinary system, which aids in the elimination of urea, creatinine, uremic wastes, nitrogenous wastes, and toxins in addition to other unwanted materials. To maintain the balance of molecules like potassium, sodium, and electrolytes.[12-25]

## URETHRA

The urethra is the channel that the ureter uses to transfer urine from the bladder to the outside of the body.It has two openings: one for the ureter and one for the urinary system, and it is situated in the lower stomach. A tiny, flexible tube known as the ureter connects the bladder to the exterior of the urethra. The ureter is the name given to this three-part tube. The female urethra is around 5 cm long and terminates both after the vaginal entrance and prior to the clitoris. The urethra in males measures about 20 to 25 cm in length and terminates at the tip of the penis. The muscles of the urethral sphincter govern urine flow. Two urethral sphincter muscles are present. One is internal, and the other is outside. When the bladder reaches a certain level of distention, the smooth muscle internal urethral sphincter, which is formed of, automatically opens. The internal sphincter has opened when you feel the urge to urinate. Skeletal muscle makes up the external urethral sphincter, which can be held up tightly to postpone urination or opened wide to let pee flow.

## RENAL VASCULAR ANATOMY

The renal artery most prominently releases one or more inferior suprarenal arteries during its extra renal travel. The renal artery also emits a number of unidentified branches that go to the ureter, peril-nephric tissue, renal capsule, and renal pelvis. It divides into an anterior and posterior branch at its termination, which is close to the kidney's hilum: Together with the superior suprarenal artery (which emerges from the inferior phrenic artery) and middle suprarenal artery, the inferior suprarenal artery serves the adrenal gland (arising from the abdominal aorta). The posterior branch supplies the kidney's posterior portion after passing behind the renal pelvis.[26-30]

Branches of the anterior branch that supply the renal vascular segments are further divided into segmental arteries. It releases segment arteries known as apical, anterior superior, anterior lower, and inferior modular arteries, each of which supplies a different section. The lobar branches are then produced by the segmental arteries, typically one for each renal pyramid. These further divide into inter lobar arteries as they approach the minor calyces, and at the root of the pyramids, they develop into acute arteries. The acute arteries then pass into the nephrons as interlobular arteries before coming to an end as afferent and efferent arterioles in the glomerulus. [31-43]

## CONCLUSION

Concluding with the statement that the urinary system is one the major functioning systems of human body. The parts of the urinary systems helps to excrete the toxic wastes and unable a living being to spend a healthy and toxic free life.

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