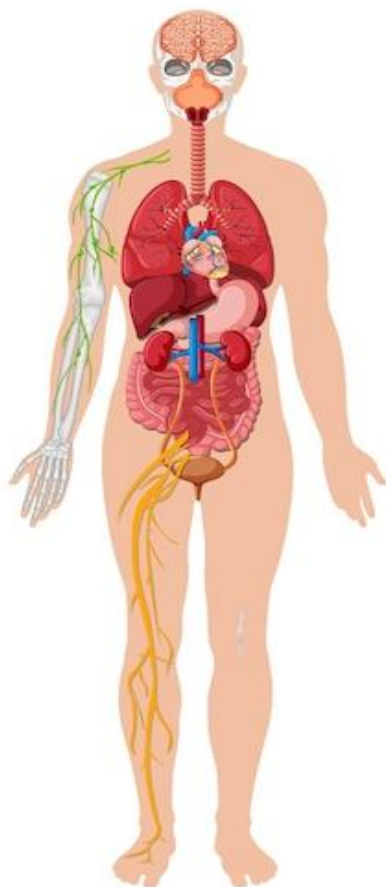


Anatomy

FOR 3RD YEAR MEDICAL PHYSICS
STUDENTS

LEC. NEEAN F. MAJEED

ANATOMY OF THE HUMAN BODY



• Brain



• Lymph
• Lymph nodes



• Skull



• Blood vessels



• Oesophagus



• Small intestine



• Lung



• Large intestine



• Stomach



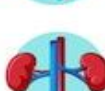
• Muscle



• Liver



• Bone
• Joint



• Kidneys



• Nerve



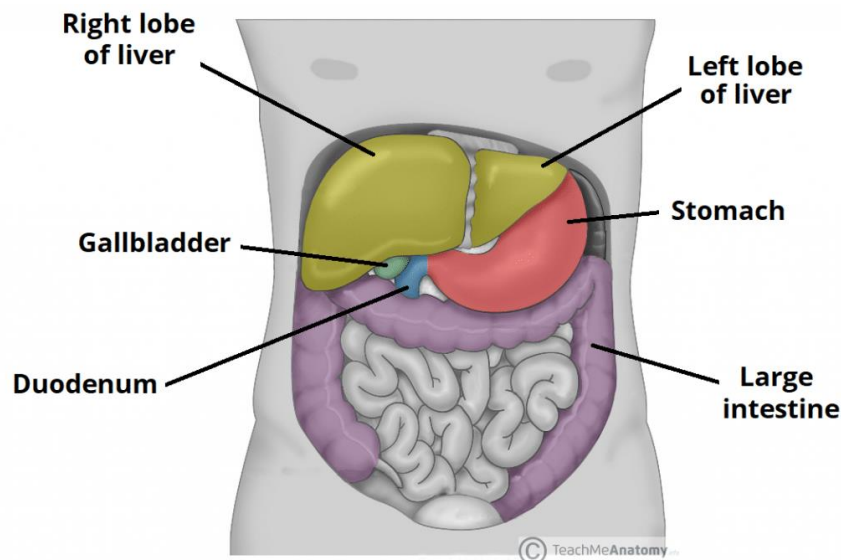
• Heart



• Bladder

The Accessory Organs of the Abdomen

An accessory organ is a structure that assists the functionality of other organs in a system. The accessory organs of the abdomen include the liver, gallbladder, pancreas, spleen, adrenal glands, kidneys and the mesentery. The liver, gallbladder and pancreas are all accessory organs of digestion.

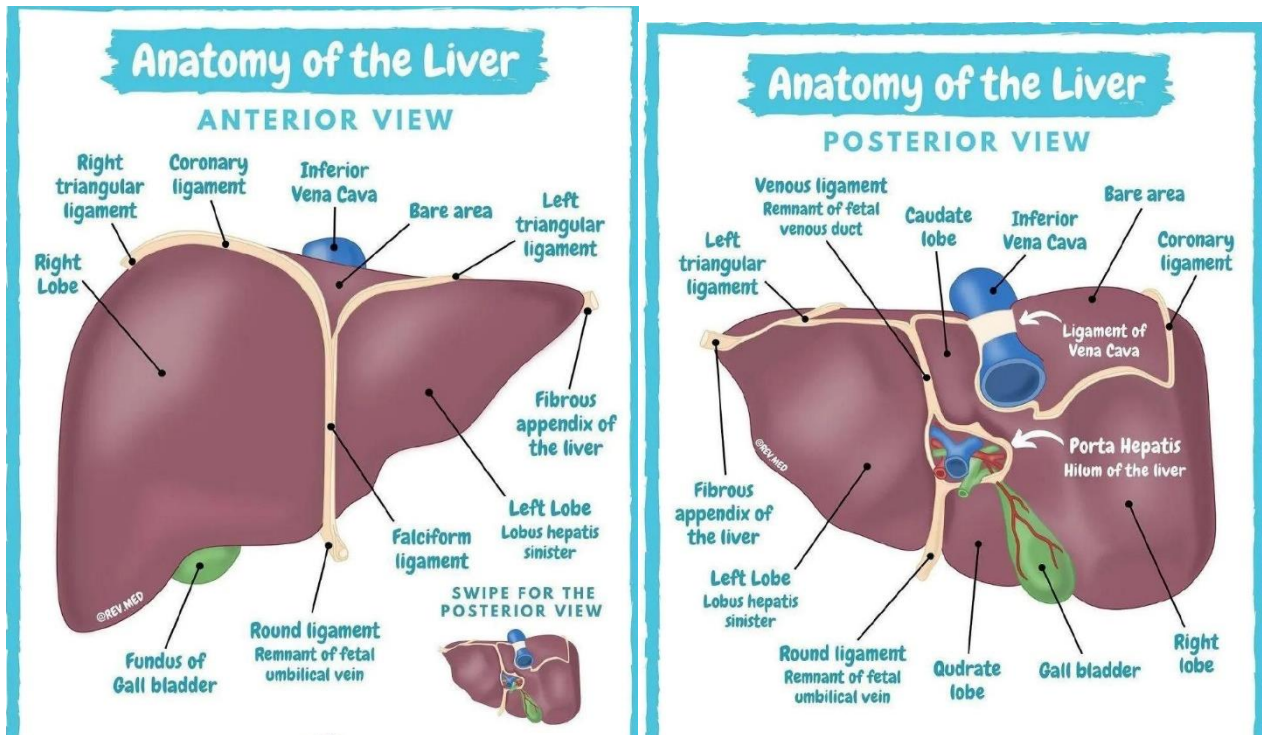


The liver is the largest organ in the abdominal cavity, and the largest gland in the human body. The liver is located in the upper right-hand portion of the abdominal cavity, beneath the diaphragm, and on top of the stomach, right kidney, and intestines. Shaped like a cone, the liver is a dark reddish-brown organ that weighs about 3 pounds. Its functions include; bile synthesis, glycogen storage, clotting factor production and filtering the blood that it receives from the digestive tract before passing it to the rest of the body.

There are 2 distinct sources that supply blood to the liver, including the following:

- Oxygenated blood flows in from the hepatic artery
- Nutrient-rich blood flows in from the hepatic portal vein

The liver holds about one pint (13%) of the body's blood supply at any given moment. The liver consists of 2 main lobes. Both are made up of 8 segments that consist of 1,000 lobules (small lobes). These lobules are connected to small ducts (tubes) that connect with larger ducts to form the common hepatic duct. The common hepatic duct transports the bile made by the liver cells to the gallbladder and duodenum (the first part of the small intestine) via the common bile duct.



Functions of the liver

The liver regulates most chemical levels in the blood and excretes a product called bile. This helps carry away waste products from the liver. All the blood leaving the stomach and intestines passes through the liver. The liver processes this blood and breaks down, balances, and creates the nutrients and also metabolizes drugs into forms that are easier to use for the rest of the body or that are nontoxic.

- Production of bile, which helps carry away waste and break down fats in the small intestine during digestion
- Production of certain proteins for blood plasma
- Production of cholesterol and special proteins to help carry fats through the body
- Conversion of excess glucose into glycogen for storage (glycogen can later be converted back to glucose for energy) and to balance and make glucose as needed
- Regulation of blood levels of amino acids, which form the building blocks of proteins
- Processing of hemoglobin for use of its iron content (the liver stores iron)
- Conversion of poisonous ammonia to urea (urea is an end product of protein metabolism and is excreted in the urine)
- Clearing the blood of drugs and other poisonous substances
- Regulating blood clotting

- Resisting infections by making immune factors and removing bacteria from the bloodstream
- Clearance of bilirubin, also from red blood cells. If there is an accumulation of bilirubin, the skin and eyes turn yellow.
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Gallbladder is located in the upper right part of your abdomen (belly). It sits just under your liver. It functions to concentrate and store bile that is produced by the liver, and release it during digestion. The parts of the gallbladder and proximal biliary tree.

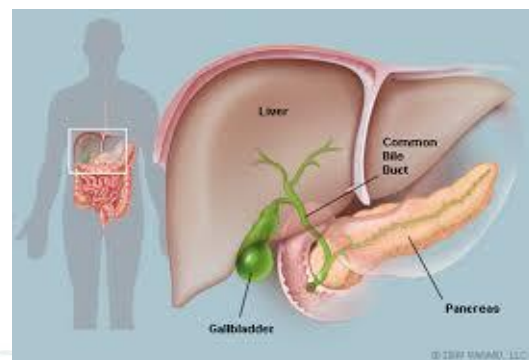
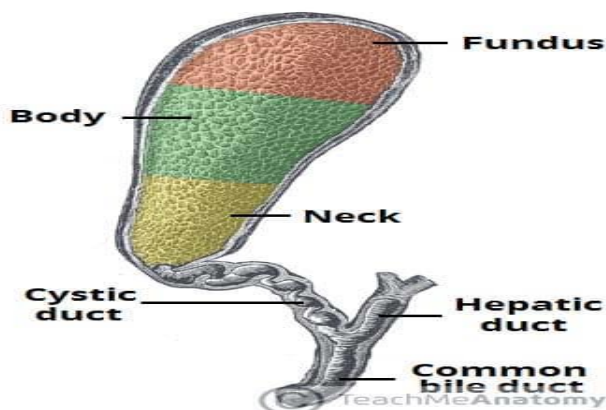
Gallbladder Function

The function of the gallbladder is to store bile, a fluid that helps with digestion. This muscular organ also concentrates and releases bile into the digestive system. When bile is needed, the gallbladder contracts, forcing the fluid through a tube called the cystic duct.

The gallbladder is located just below the liver on the right side of the body. Bile, which is also known as "gall," is produced in the liver and passed into the gallbladder for storage. This is where the gallbladder gets its name.

There are several important functions of the gallbladder, which include:

- Storing and concentrating bile
- Responding to intestinal hormones to empty and refill its bile stores
- Contributing to regulating the composition of bile (the percentage of water, bile salts, and more)
- Controlling the flow of bile into the small intestine
- Secreting bile into the biliary tract and duodenum (the first section of the small intestine)



The pancreas is an elongated, tapered organ in the upper part of the abdomen, behind the stomach and in front of the spine. The right side of the organ called the head is the widest part of the organ and lies in the curve of the duodenum, the first division of the small intestine. The tapered left side extends slightly upward called the body of the pancreas and ends near the spleen called the tail.

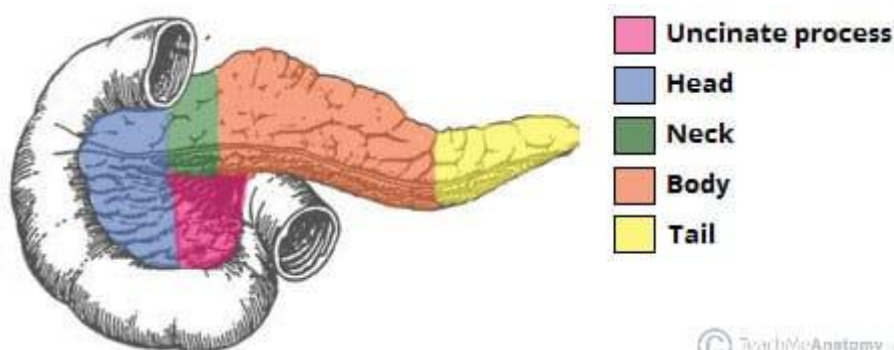
The pancreas is made up of 2 types of glands:

- **Exocrine.** The exocrine gland secretes digestive enzymes. These enzymes are secreted into a network of ducts that join the main pancreatic duct. This runs the length of the pancreas.
- **Endocrine.** The endocrine gland, which consists of the islets of Langerhans, secretes hormones into the bloodstream.

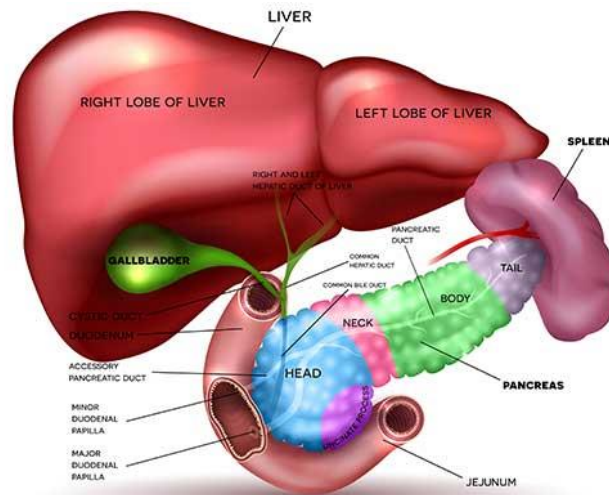
Functions of the pancreas

The pancreas has digestive and hormonal functions:

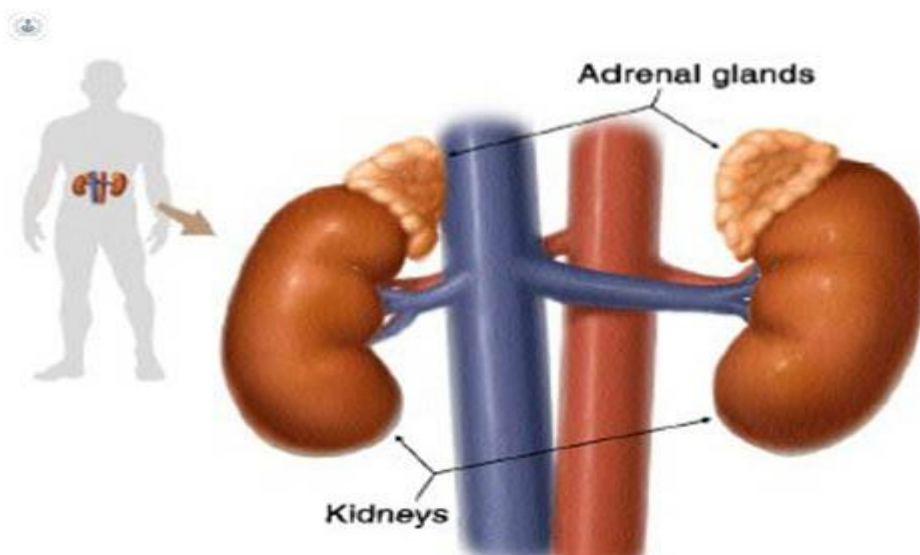
- The enzymes secreted by the exocrine gland in the pancreas help break down carbohydrates, fats, proteins, and acids in the duodenum. These enzymes travel down the pancreatic duct into the bile duct in an inactive form. When they enter the duodenum, they are activated. The exocrine tissue also secretes a bicarbonate to neutralize stomach acid in the duodenum. This is the first section of the small intestine.
- The main hormones secreted by the endocrine gland in the pancreas are insulin and glucagon, which regulate the level of glucose in the blood, and somatostatin, which prevents the release of insulin and glucagon.



The spleen is a soft, dark-purple, organ located in the upper left side of the abdomen, just behind the bottom of the rib cage. It is about the size of a small fist. The spleen is part of the immune system. It filters foreign substances from the blood, removes worn-out blood cells from the blood, regulates blood flow to the liver, and sometimes stores blood cells. At any given time, almost one-third of the blood in the body is located in the spleen.

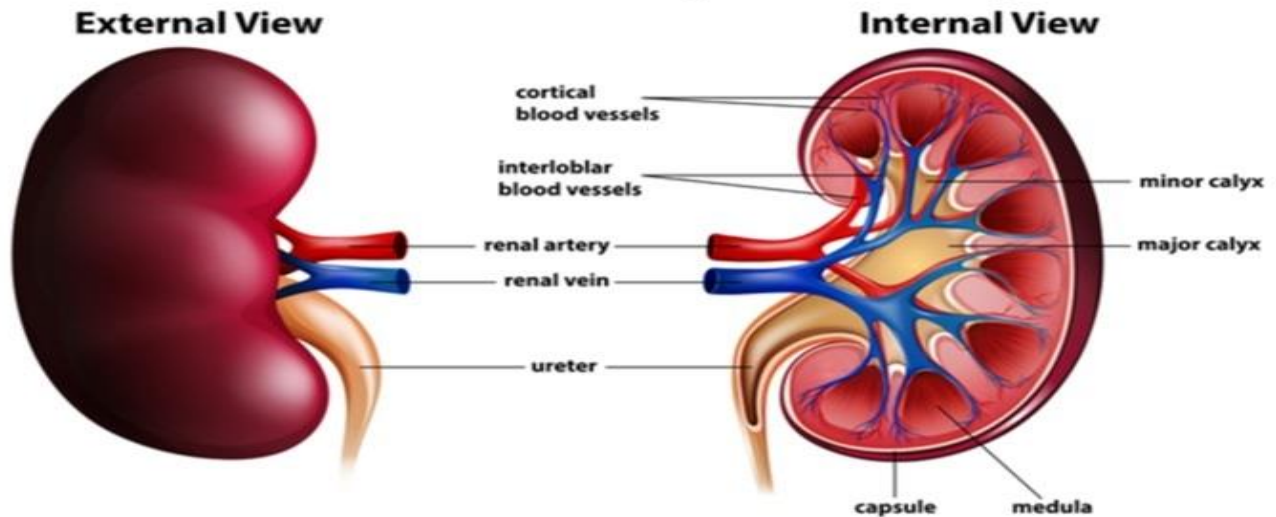


- **Adrenal glands**, also known as suprarenal glands, are small, triangular-shaped glands located on top of both kidneys.
- Adrenal glands produce hormones that help regulate your metabolism, immune system, blood pressure, response to stress and other essential functions.
- Adrenal glands are composed of two parts — the cortex and the medulla — which are each responsible for producing different hormones.
- When adrenal glands don't produce enough hormones, this can lead to adrenal insufficiency (Addison's disease).
- Adrenal glands may develop nodules that can be benign or malignant, which can potentially produce excessive amounts of certain hormones leading to various health issues

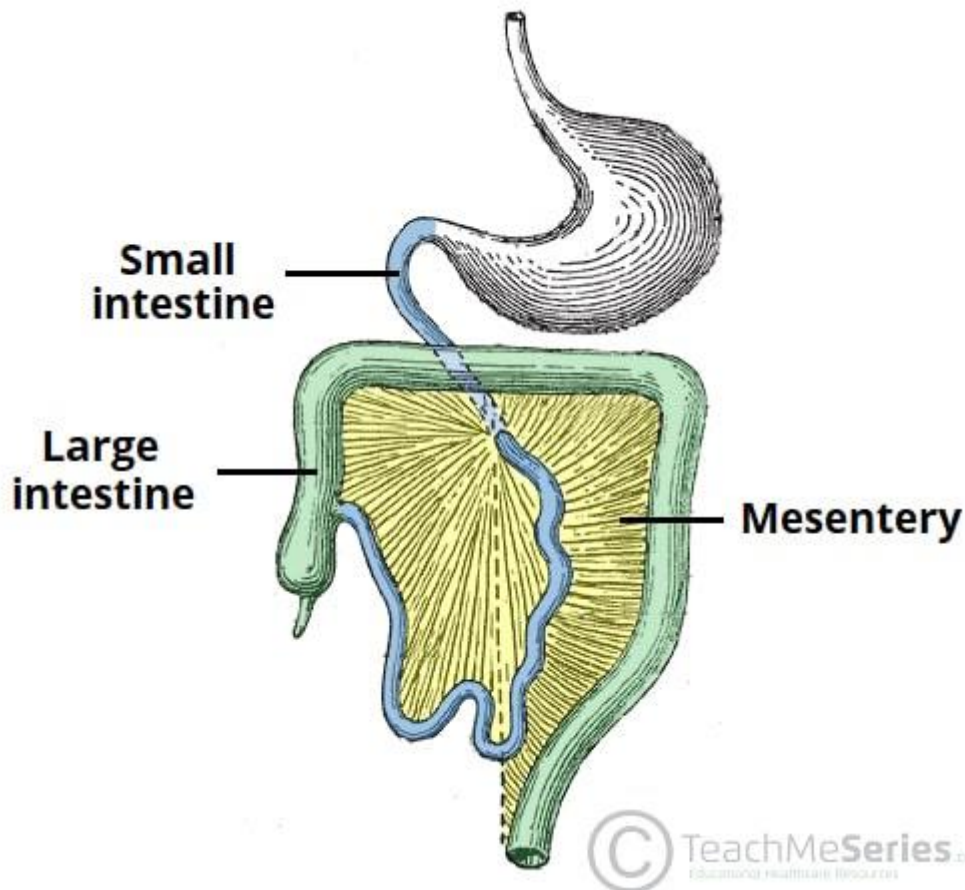


The kidneys are bilateral organs located in the posterior abdomen. They function to filter and excrete waste products from the blood and to regulate the water and electrolyte balance in the body. The kidneys excrete the waste products as urine.

Human Kidney Anatomy



The abdominal mesentery is a double fold of peritoneal tissue that attaches organs, such as the small and large intestine, to the posterior abdominal wall. Blood vessels, nerves and lymphatics all run within the mesentery to supply the intestine



The lungs are the organs of respiration. They are located in the thorax, either side of the mediastinum.

The function of the lungs is to oxygenate blood. They achieve this by bringing inspired air into close contact with oxygen-poor blood in the pulmonary capillaries.

Anatomical Position and Relations

The lungs lie either side of the mediastinum, within the thoracic cavity. Each lung is surrounded by a pleural cavity, which is formed by the visceral and parietal pleura.

They are suspended from the mediastinum by the lung root – a collection of structures entering and leaving the lungs. The medial surfaces of both lungs lie in close proximity to several mediastinal structures:

Left Lung	Right Lung
<ul style="list-style-type: none"> • Heart • Arch of aorta • Thoracic aorta • Esophagus 	<ul style="list-style-type: none"> • Esophagus • Heart • Inferior vena cava • Superior vena cava • Azygous vein

