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ANATOMICAL STRUCTURE OF THE LIVER

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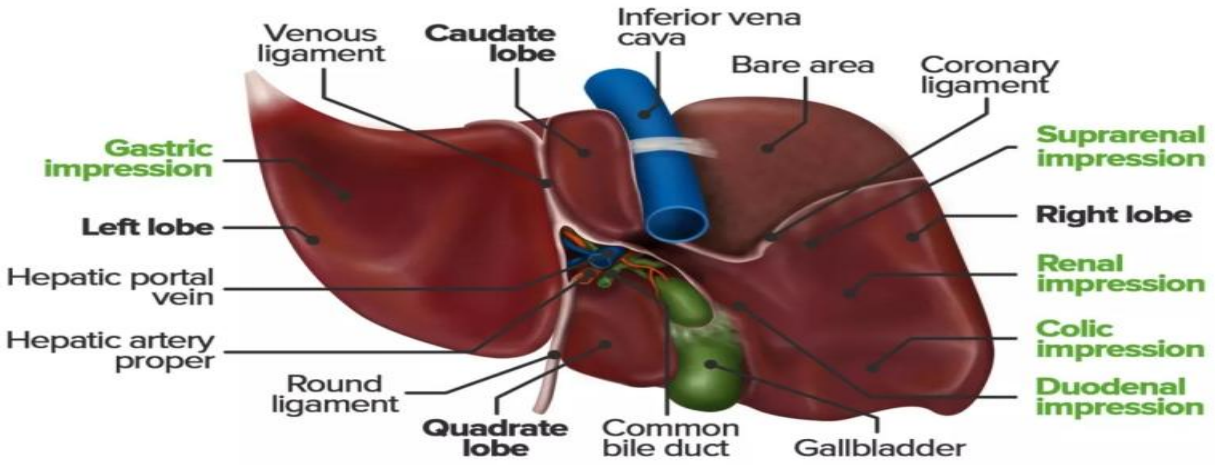
Annotation: Liver, the largest gland in the body, a spongy mass of wedge-shaped lobes that has many metabolic and secretory functions. The liver secretes bile, a digestive fluid; metabolizes proteins, carbohydrates, and fats; stores glycogen, vitamins, and other substances; synthesizes blood-clotting factors; removes wastes and toxic matter from the blood; regulates blood volume; and destroys old red blood cells.

Key words: Liver, blood, vascular system.

Liver tissue consists of a mass of cells tunneled through with bile ducts and blood vessels. Hepatic cells make up about 60 percent of the tissue and perform more metabolic functions than any other group of cells in the body. A second group of cells, called Kupffer cells, line the smallest channels of the liver's vascular system and play a role in blood formation, antibody production, and ingestion of foreign particles and cellular debris.

Each day the liver secretes about 800 to 1,000 ml (about 1 quart) of bile, which contains bile salts needed for the digestion of fats in the diet. Bile is also the medium for excretion of certain metabolic waste products, drugs, and toxic substances. From the liver a duct system carries bile to the common bile duct, which empties into the duodenum of the small intestine and which connects with the gallbladder, where it is concentrated and stored. The presence of fat in the duodenum stimulates the flow of bile out of the gallbladder and into the small intestine. Senescent (worn-out) red blood cells are destroyed in the liver, spleen, and bone marrow. A pigment, bilirubin, formed in the process of hemoglobin breakdown, is released into the bile, creating its characteristic greenish orange colour, and is excreted from the body through the intestine.



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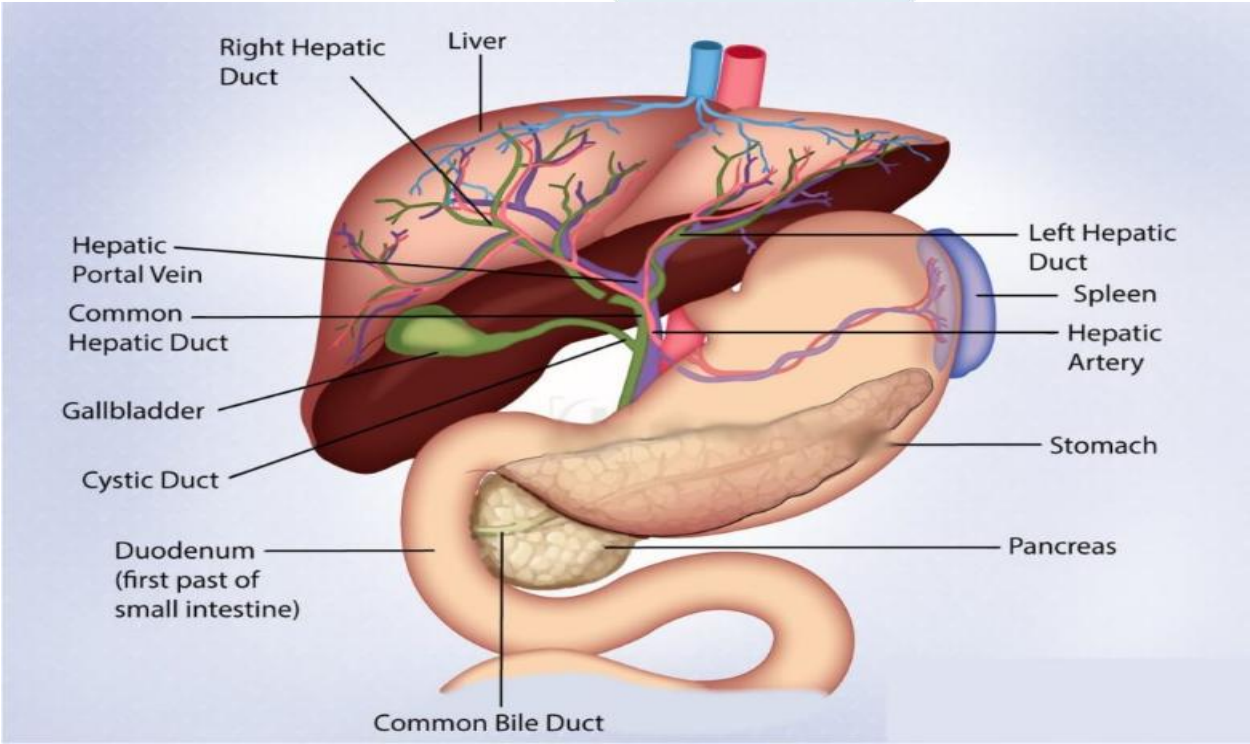

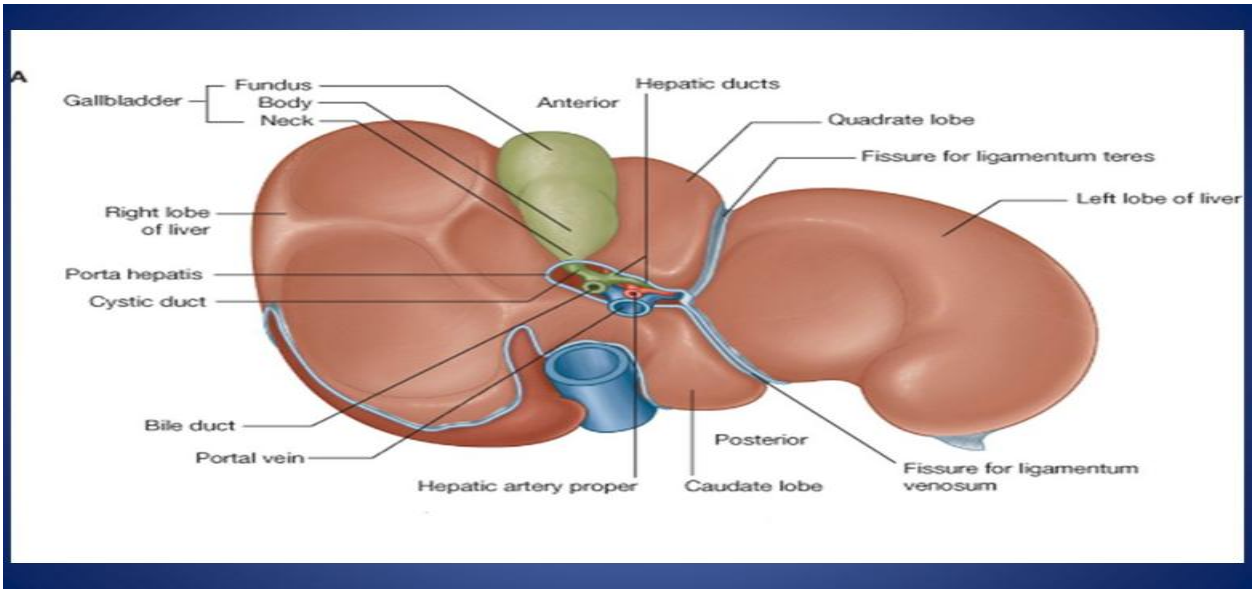

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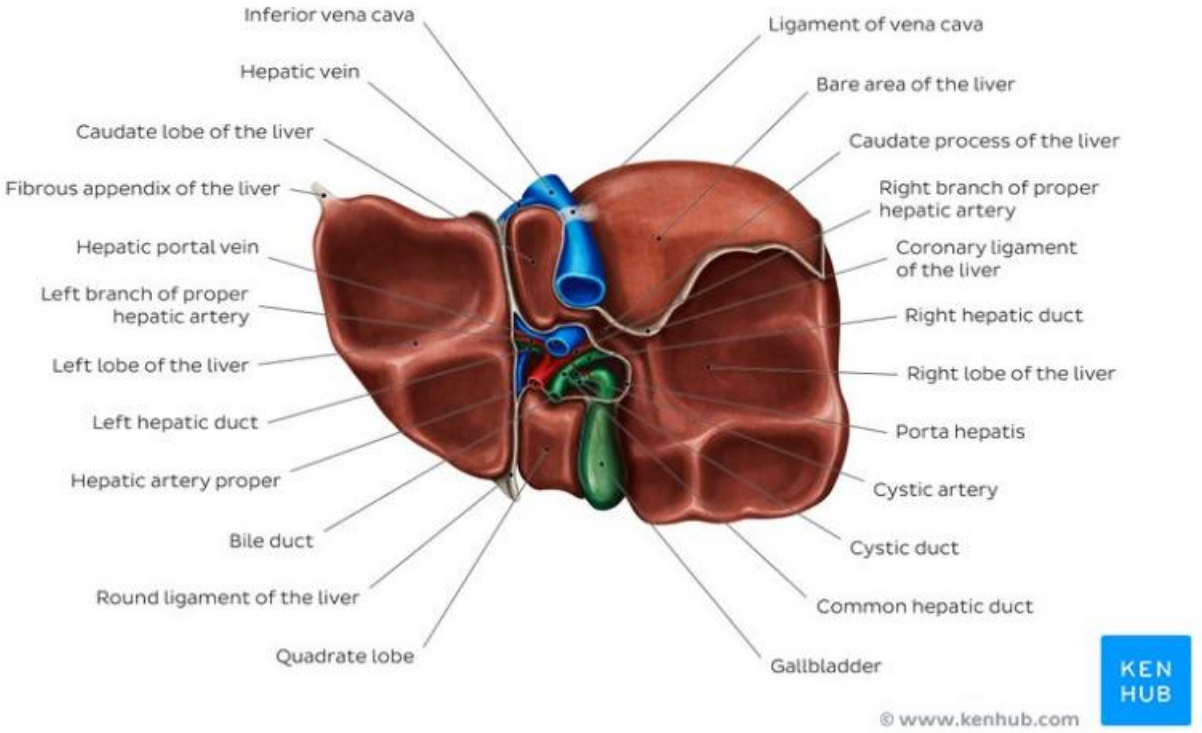

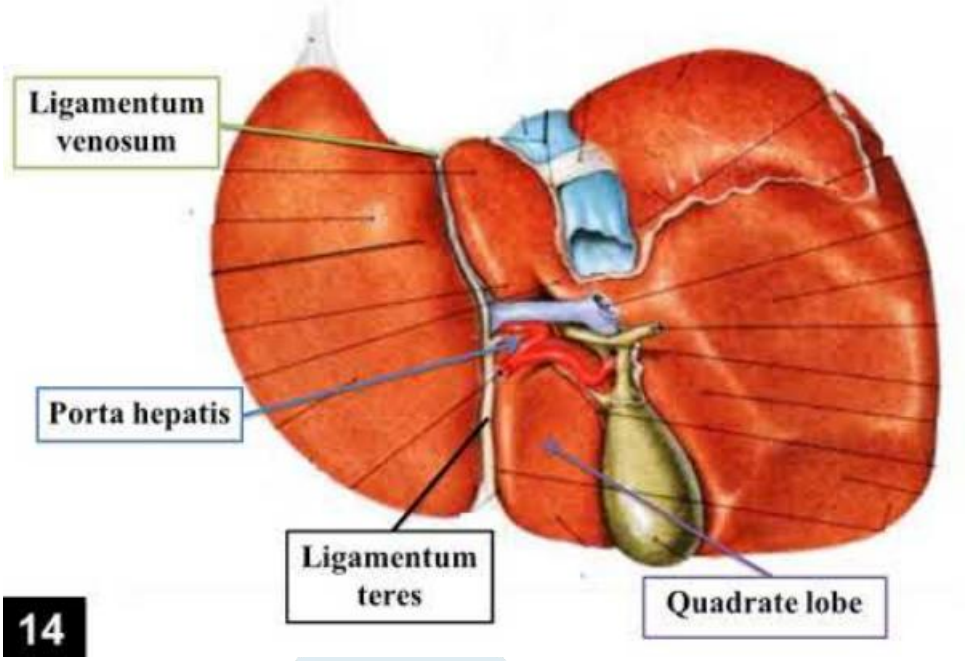

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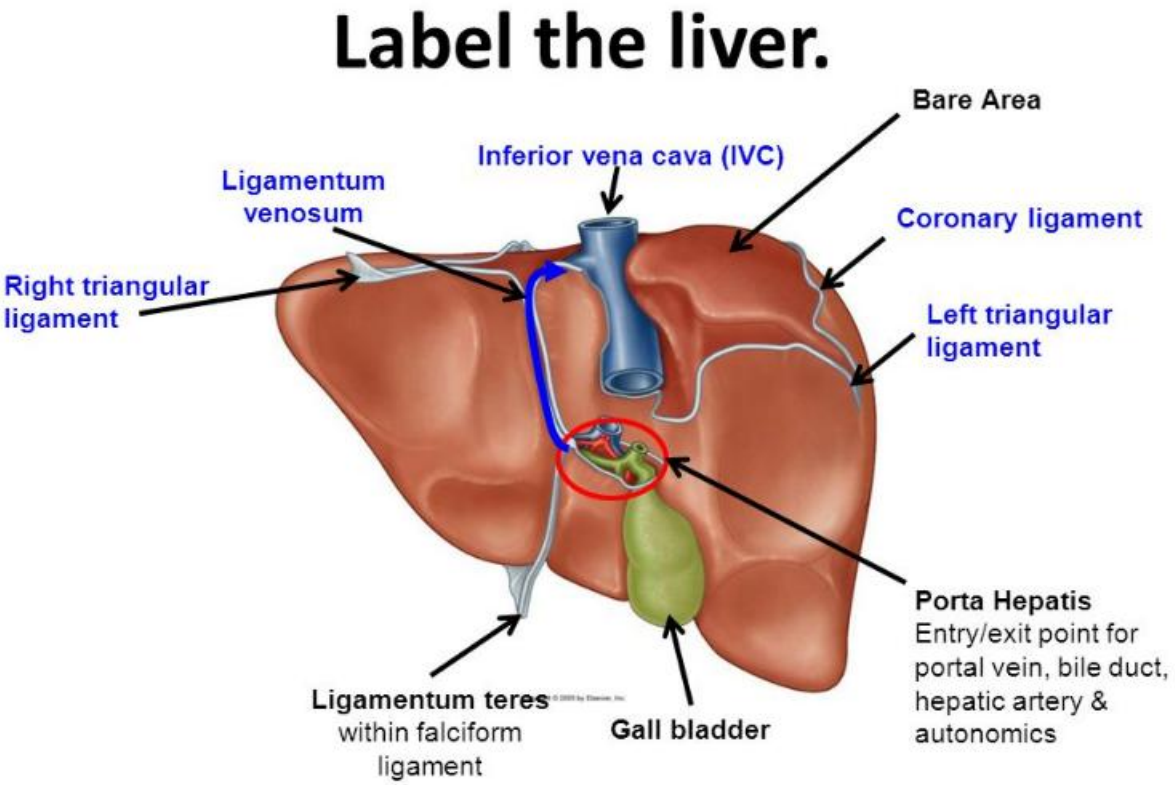

The liver cells synthesize a number of enzymes. As blood flows through the liver, both from the portal vein and from the hepatic artery, the cells and enzymes are filtered. Nutrients entering the liver from the intestine are modified into forms that are usable by the body cells or are stored for future use. Fats are converted into fatty acids and then into carbohydrates or ketone bodies and transported by the blood to the tissues, where they are further metabolized. Sugars are converted into glycogen, which remains stored in the liver until it is needed for energy production; it is then reconverted into glucose and released into the bloodstream. The liver manufactures blood serum proteins, including albumin and several clotting factors, and supplies them to the blood. The liver also metabolizes nitrogenous waste products and detoxifies poisonous substances, preparing them for elimination in the urine or feces.

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