

Abdomen

Part one

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Goals

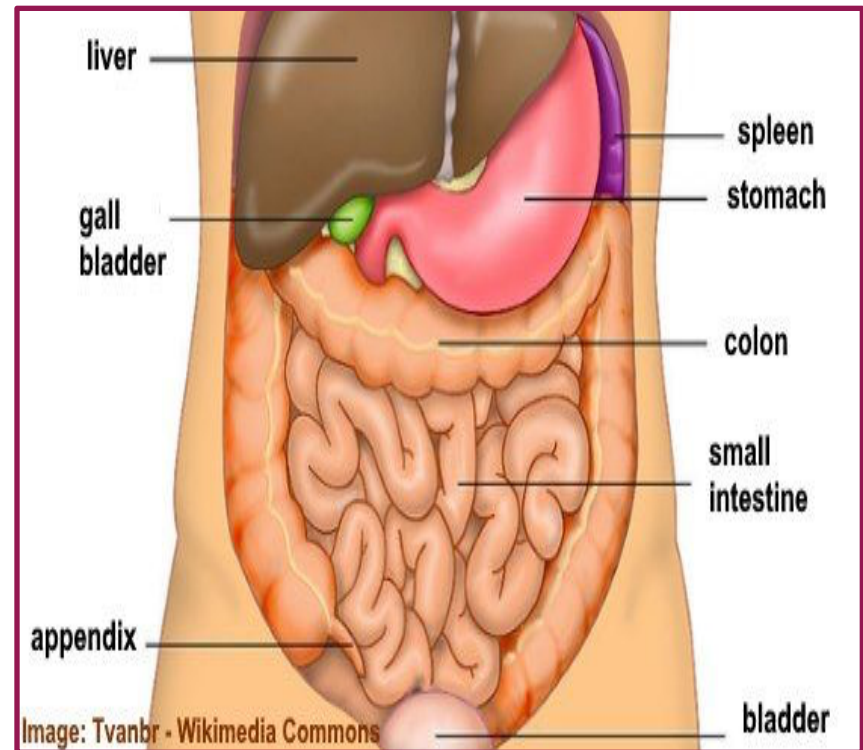
- **Knowing** the different parts of the abdomen.
- **Knowing** various structures of intra abdominal organs, their **functions** and clinical applications.

Objectives

- Introduction
- Definition
- Abdominal Quadrants
- Contents of abdominal regions
- Clinical significance
- Layers of the abdominal wall
- Function of the abdominal wall
- Abdominal organs
- Stomach
- Duodenum
- General description
- Function
- Pancreas
- General description
- Function of the pancreas

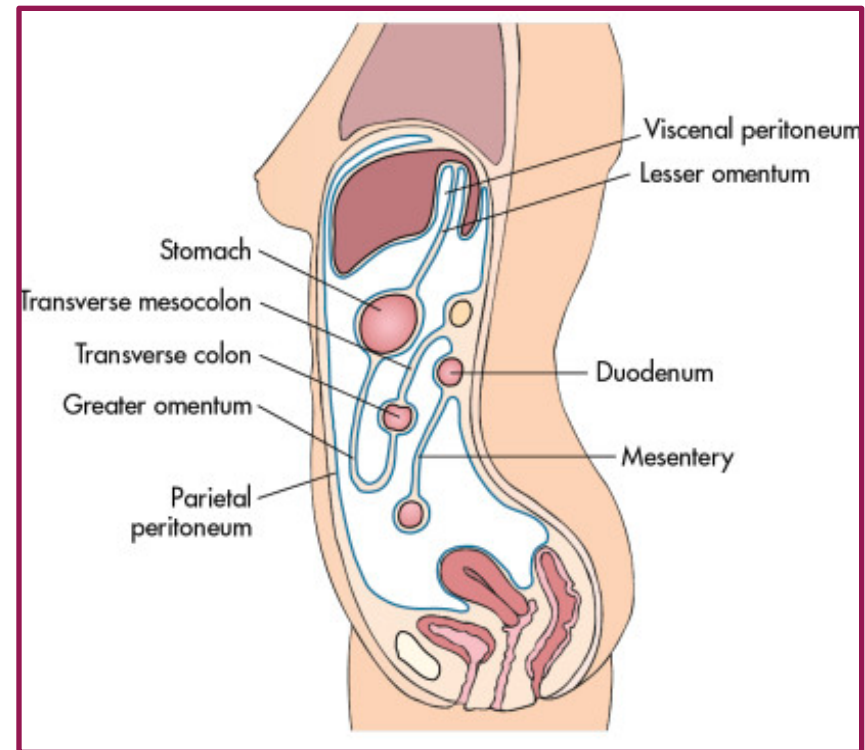
Introduction

The **abdomen** is the part of the body that contains all of the structures between the thorax (chest) and the pelvis, and is separated from the thorax via the diaphragm. The **abdomen** contains many accessory organs, including the liver, gallbladder, pancreas, spleen, adrenal glands, kidneys and the mesentery.



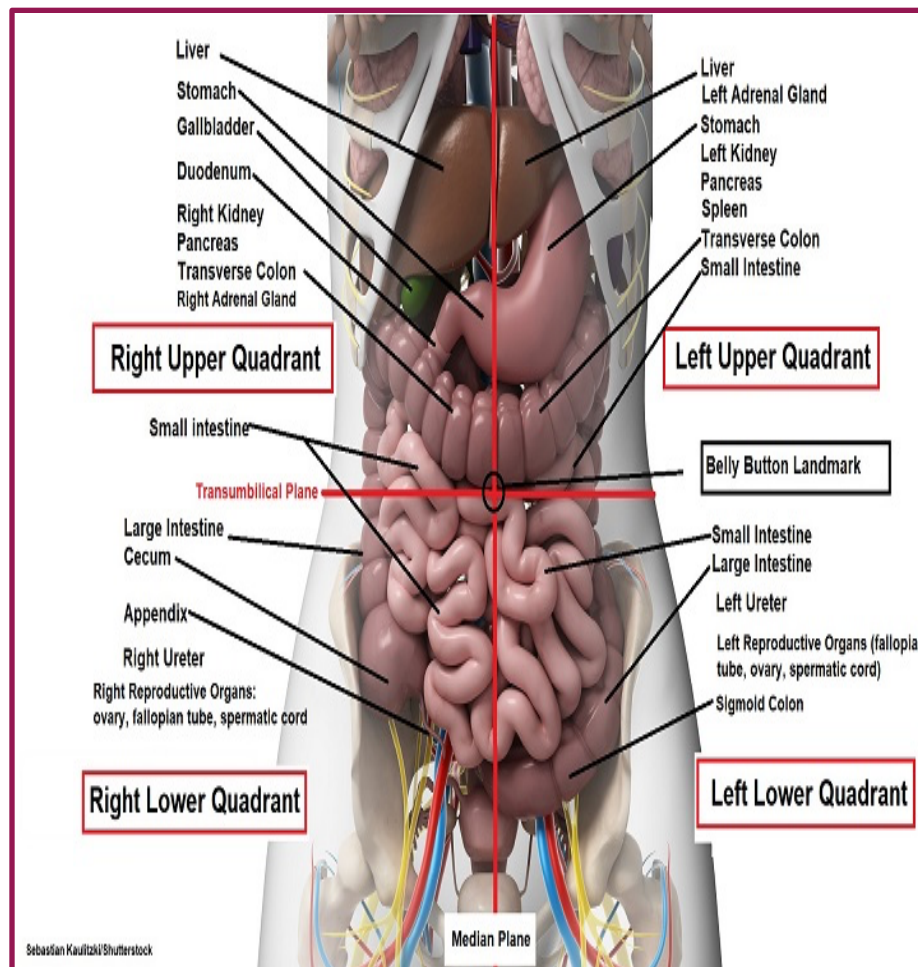
Definition

The cavity of the abdomen that is lined by **peritoneum**, is bounded above by the **diaphragm**, anteriorly by a wall of muscle and tissue, and posteriorly by the spinal column, is continuous below with the **pelvic cavity**, and contains many of the visceral organs and especially those involved in digestion (such as the stomach, liver, pancreas, kidneys, and intestines).



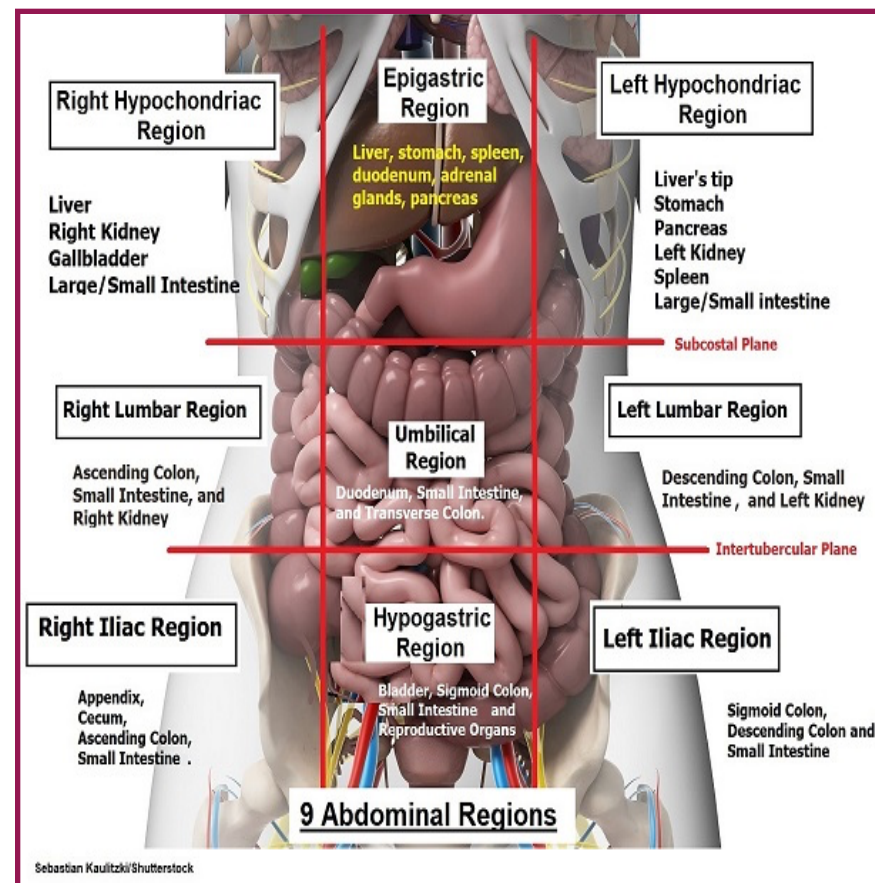
Abdominal Quadrants

- **Right Upper Quadrant:** Liver, stomach, gallbladder, duodenum, right kidney, pancreas, and the right adrenal gland.
- **Left Upper Quadrant:** Liver, stomach, pancreas, left kidney, spleen, and the left adrenal gland.
- **Right Lower Quadrant:** appendix, reproductive organs, right ureter.
- **Left Lower Quadrant:** left ureter, reproductive organs
- **NOTE: All four quadrants** contain portions of the small and large intestines.



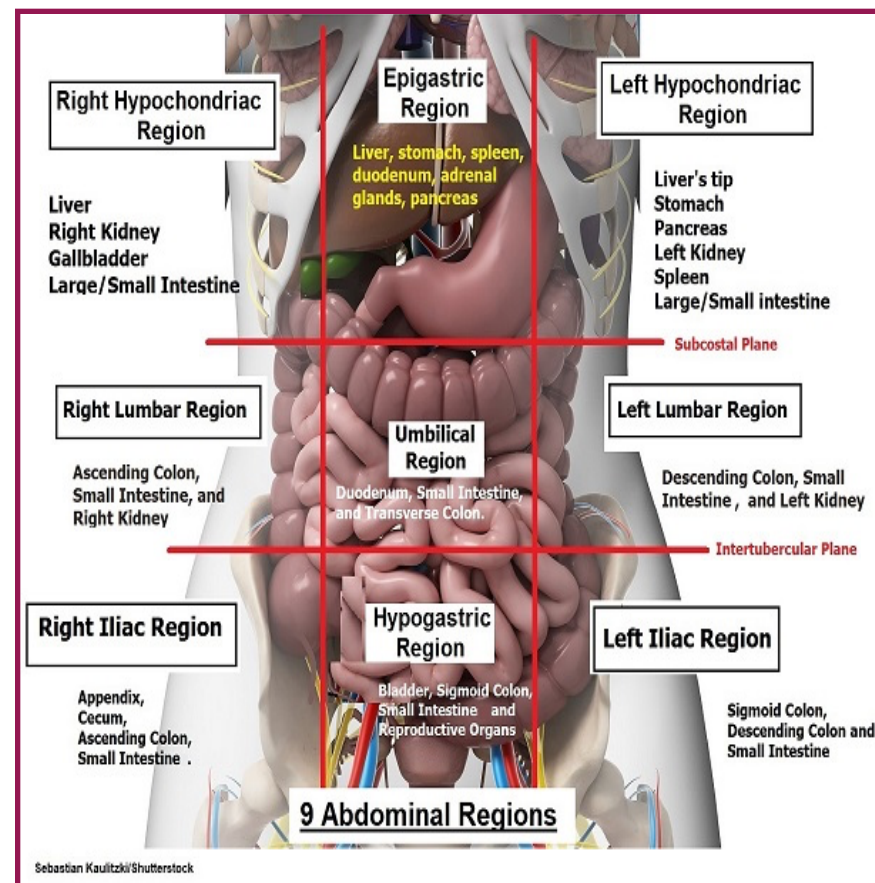
Contents of abdominal regions

- 1 **Right Hypochondriac Region:** You'll find organs such as the liver, gallbladder, right kidney, and portions of the small and large intestine in this region.
- 2 **Epigastric Region:** This region contains portions of the liver, as well as the stomach, pancreas, duodenum, spleen, and adrenal glands.
- 3 **Left Hypochondriac Region:** This contains the spleen, large/small intestines, left kidney, pancreas, stomach, and tip of the liver.
- 4 **Right Lumbar Region:** You'll find portions of the ascending colon, small intestine, and right kidney in this region.



Contents of abdominal regions

- 5 **Umbilical Region:** Here you'll find the duodenum, the small intestine, as well as the transverse colon.
- 6 **Left Lumbar Region:** You'll find parts of the descending colon, small intestine, and left kidney in this region.
- 7 **Right Iliac Region:** Here you'll find the appendix, cecum, ascending colon, and small intestine.
- 8 **Hypogastric Region:** You'll find the bladder, portions of the sigmoid colon, small intestine, and reproductive organs in this region.
- 9 **Left Iliac Region:** You'll find parts of the sigmoid colon, descending colon and small intestine in this region.



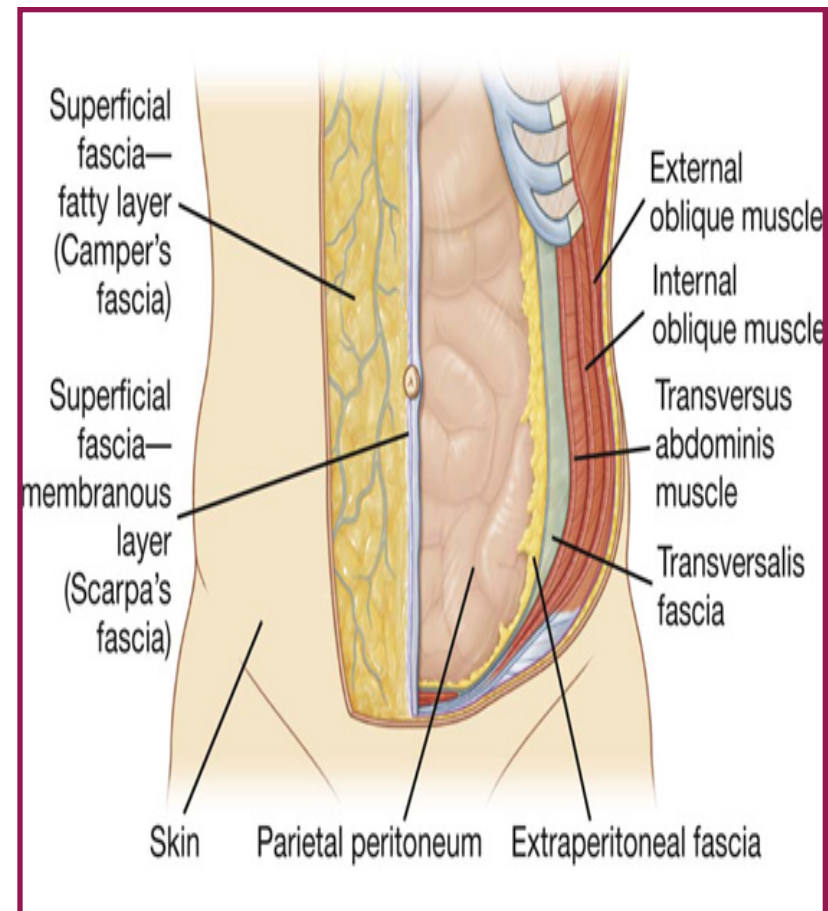
Clinical significance

If **abdominal pain** or signs of peritonitis are localised in the **LLQ**, colitis, diverticulitis, ureteral colic or pain due to ovarian cysts or pelvic inflammatory disease may be suspected. Examples of tumors in the left lower quadrant include colon cancer and ovarian tumor.

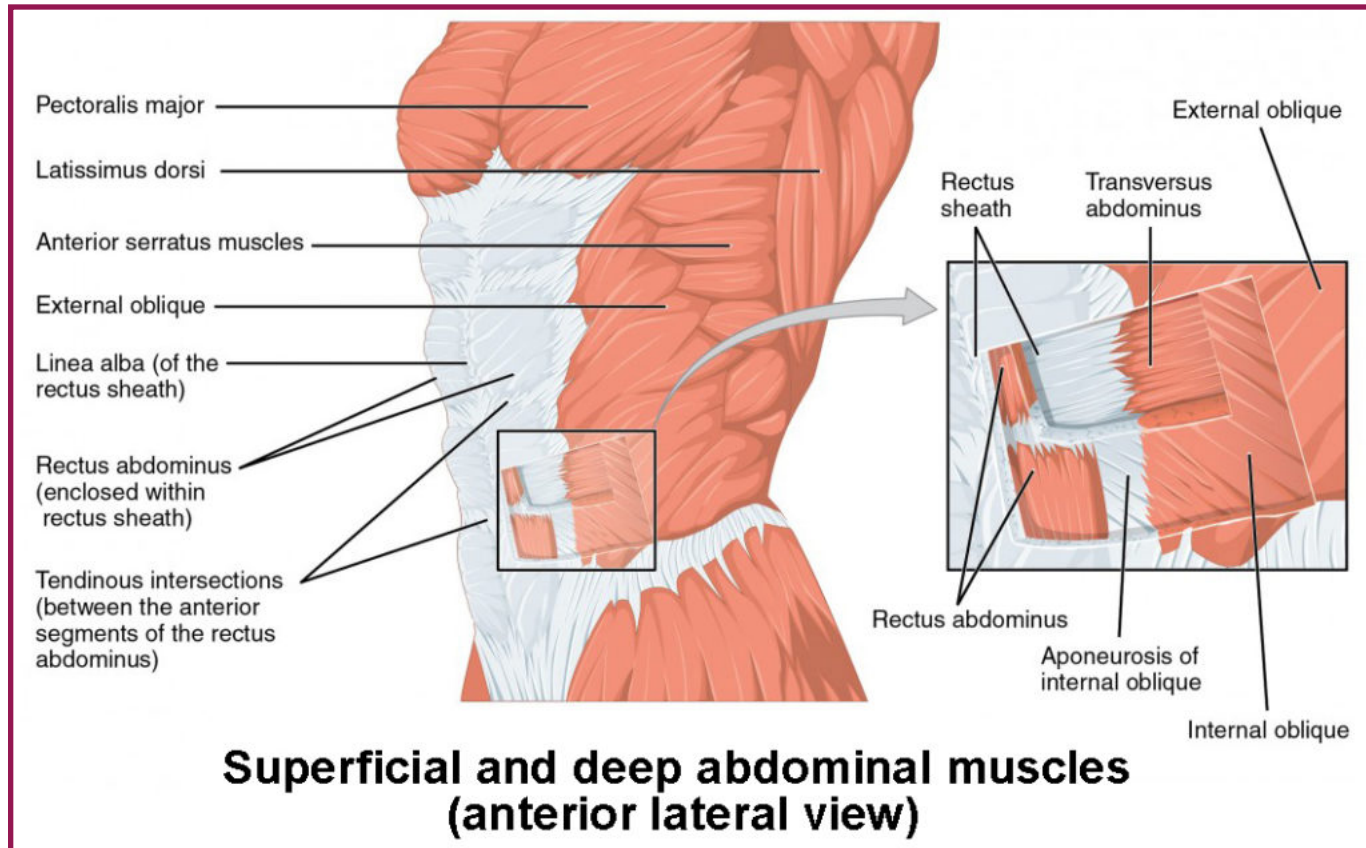
The **LUQ** may be painful or tender in the case of intestinal malrotation. The **RUQ** may be painful or tender in hepatitis, cholecystitis, and peptic ulcer. The **RLQ**, in particular the right inguinal region or right iliac fossa may be painful and tender in conditions such as appendicitis.

Layers of the abdominal wall

There are nine layers to the abdominal wall: **skin**, **subcutaneous tissue**, **superficial fascia**, **external oblique muscle**, **internal oblique muscle**, **transversus abdominis muscle**, **transversalis fascia**, **preperitoneal adipose and areolar tissue**, and **peritoneum**.



Muscles of the abdominal wall



Function of the abdominal wall

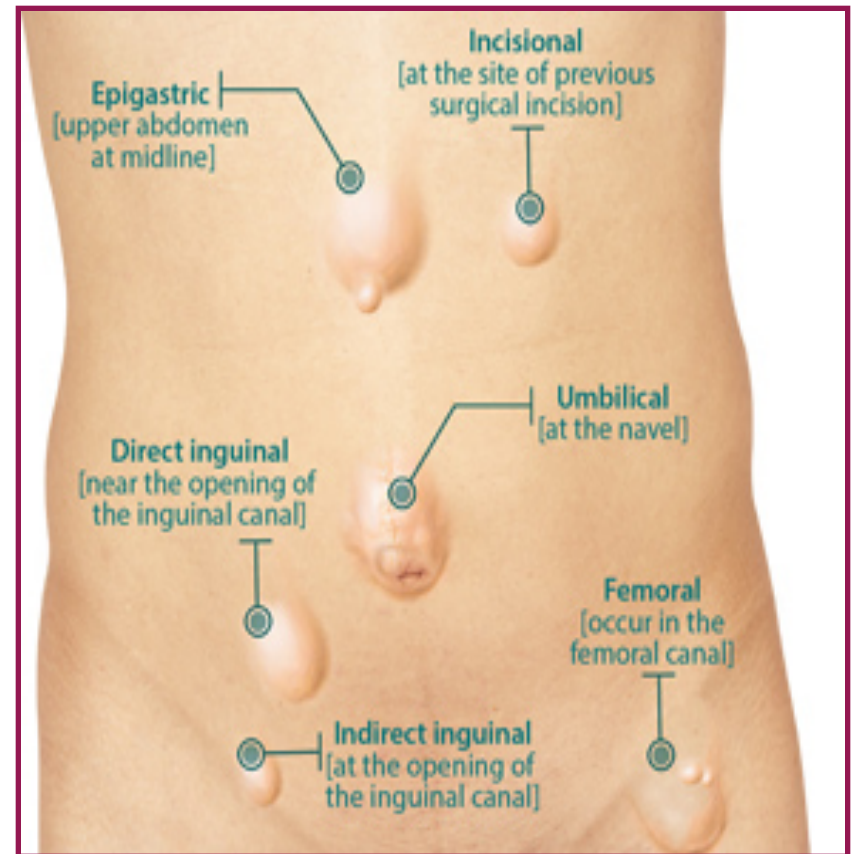
The major functions of the abdominal wall include:

- **Providing** a durable and flexible covering to prevent the abdominal viscera from leaving the abdominal cavity.
- **Protecting** internal abdominal organs from trauma/injury.
- **Maintaining** the anatomical position of the abdominal organs.
- **Assisting** expiration by pushing the abdominal organs towards the diaphragm.
- **Assisting** in coughing and vomiting by increasing intra-abdominal pressure.

Clinical significance of the abdominal wall

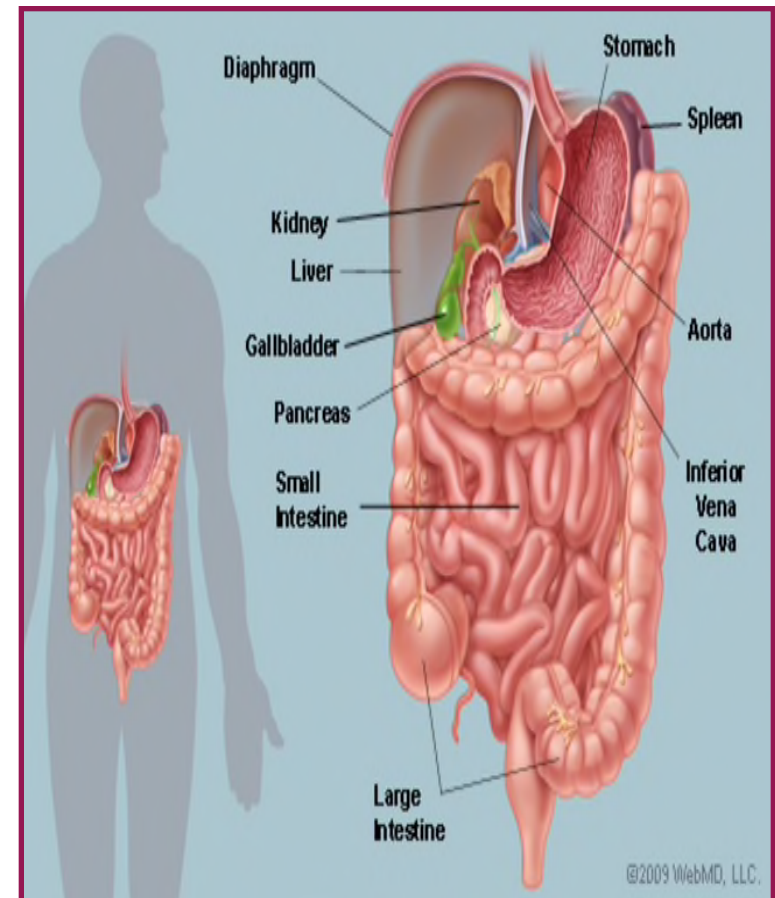
The major pathology of the anterior abdominal wall are hernias that include the following:

- Umbilical
- Femoral
- Inguinal
- Ventral
- Incisional
- Spigelian



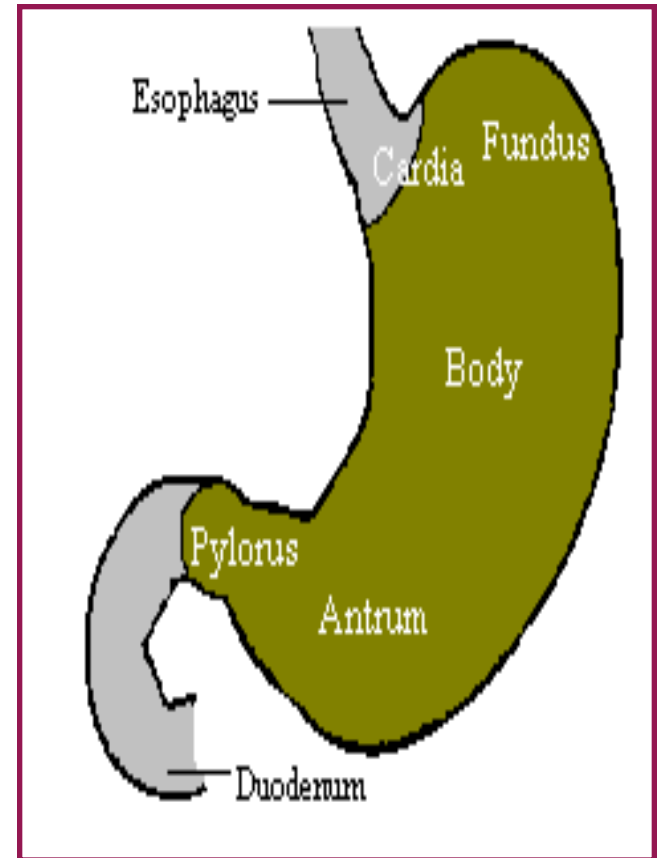
Abdominal organs

The **abdomen** contains many vital **organs**: the **stomach**, the small intestine (jejunum and ileum), the large intestine (colon), the liver, the spleen, the gallbladder, the pancreas, the uterus, the fallopian tubes, the ovaries, the kidneys, the ureters, the bladder, and many blood vessels (arteries and veins).



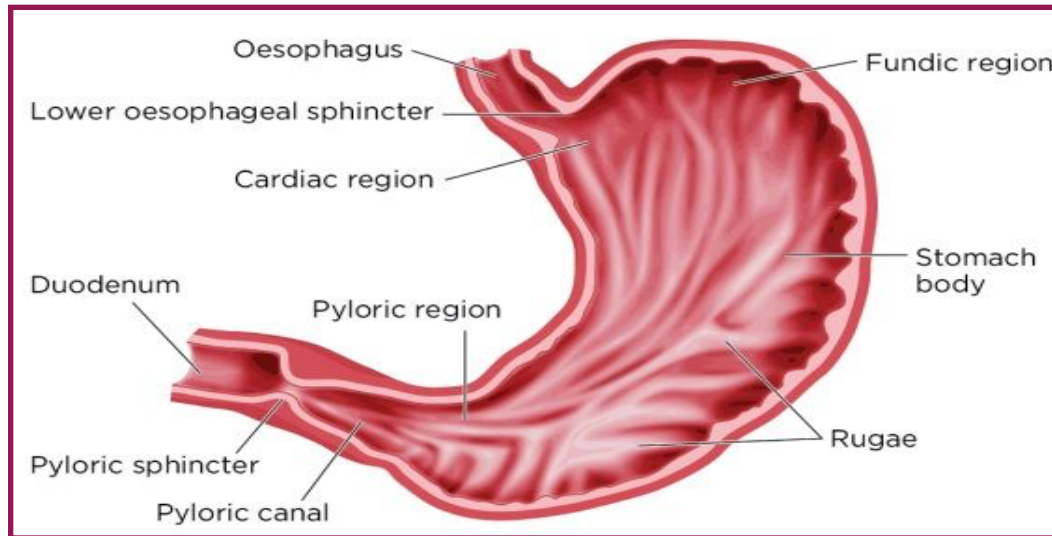
Location of stomach

The human **stomach** is subdivided into four regions: the fundus, an expanded area curving up above the cardiac opening (the opening from the **stomach** into the esophagus); the body, or intermediate region, the central and largest portion; the antrum, the lowermost, somewhat funnel-shaped portion of the **stomach**; and the ...



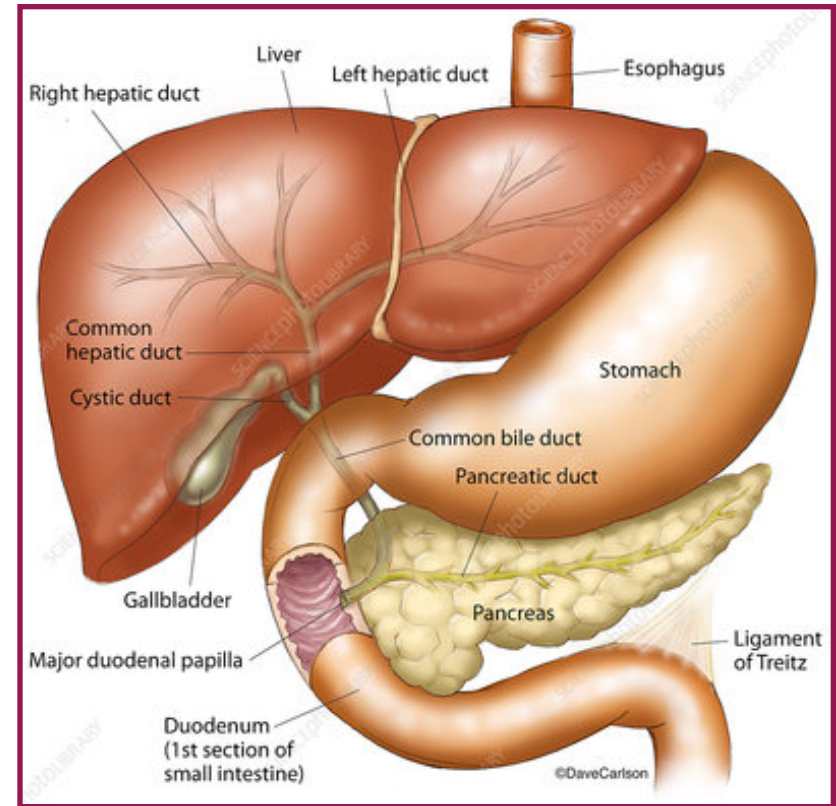
Function of the stomach

The four key components of gastric **digestive function** are its function as a reservoir, **acid secretion**, enzyme secretion and its role in **gastrointestinal motility**. The reservoir capacity of the stomach allows it to increase its volume significantly while internal pressure increases only slightly.



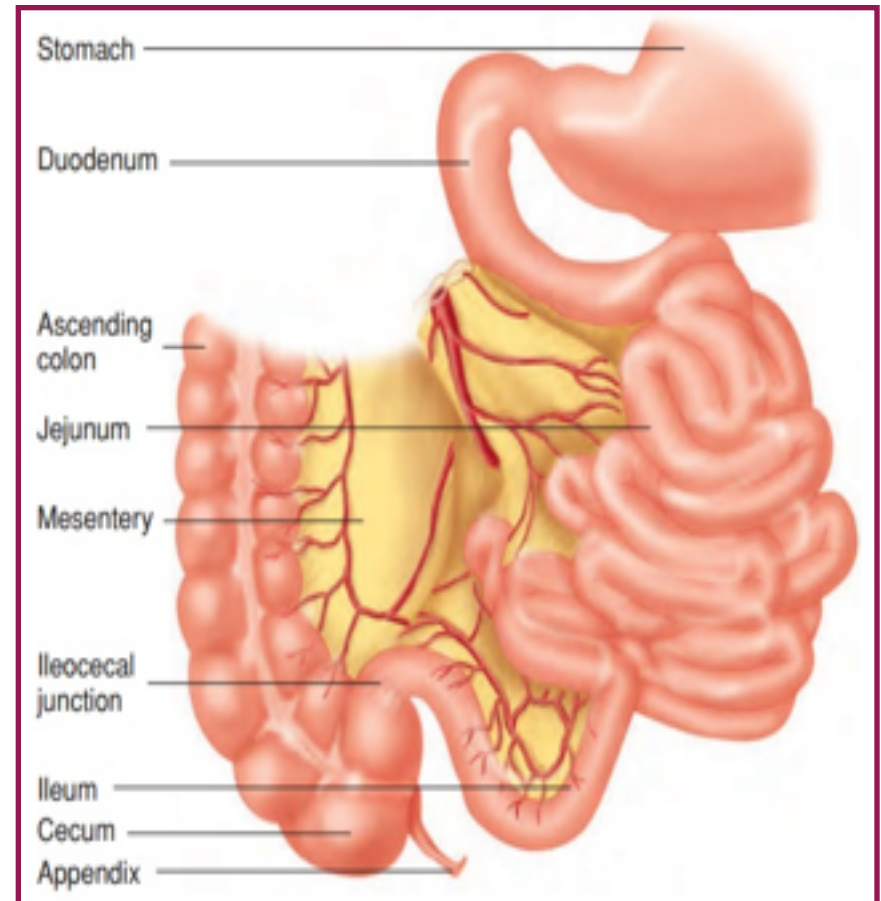
Duodenum

The **duodenum** precedes the jejunum and ileum and is the shortest part of the small intestine. In humans, the **duodenum** is a hollow jointed tube about 25–38 cm (10–15 inches) long connecting the stomach to the jejunum. It begins with the **duodenal** bulb and ends at the suspensory muscle of **duodenum**.



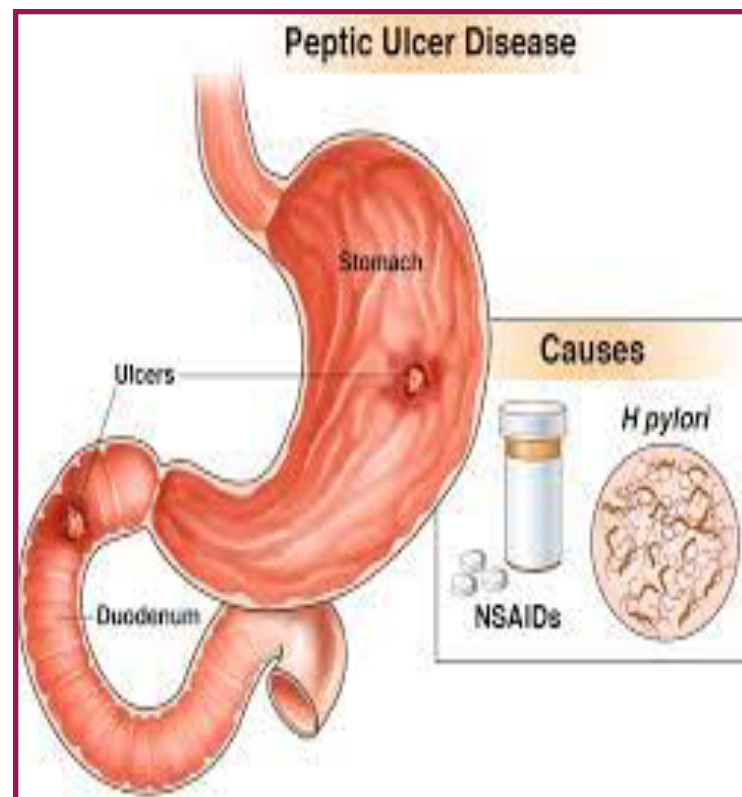
Function of the Duodenum

The **duodenum** is the first segment of the small intestine. It's largely responsible for the continuous breaking-down process. The **jejunum** and **ileum** lower in the intestine are mainly responsible for absorption of nutrients into the bloodstream.



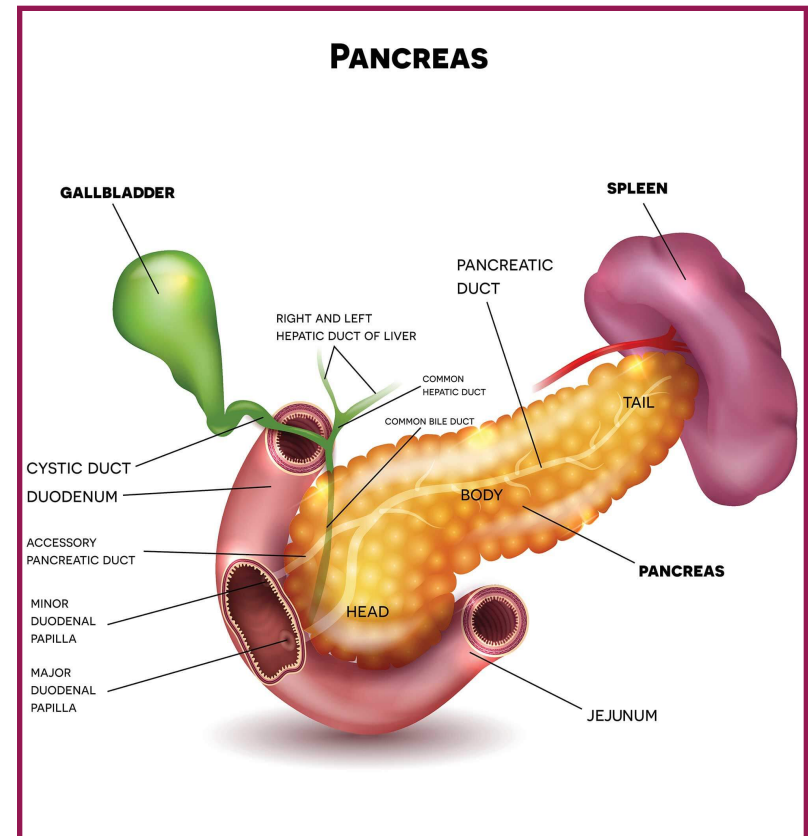
Causes of inflammation of duodenum leading to peptic ulcer

What causes duodenitis? The most **common** cause of duodenitis is H pylori infection. Other causes of duodenitis include prolonged use of medications such as non-steroidal anti-inflammatory drugs (NSAIDs), which can cause inflammation of the lining of the **duodenum**.



Pancreas

The **pancreas** secretes digestive enzymes into the duodenum that break down protein, fats and carbohydrates. The pancreas also makes insulin, passing it directly into the bloodstream. Insulin is the chief hormone in your body for metabolising sugar.



Disorders of pancreas

Pancreatitis : inflammation of the pancreas.

Diabetes mellitus : Lack of secretion of insulin hormone leading to increase blood sugar



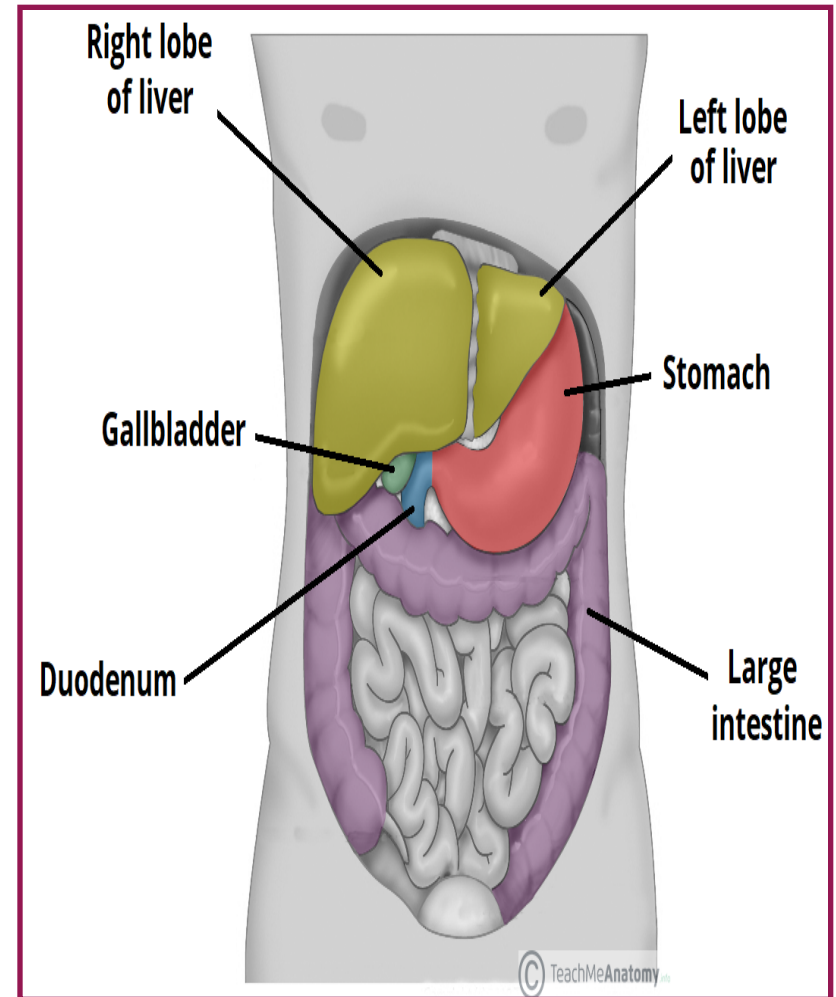
Inflammation of the pancreas



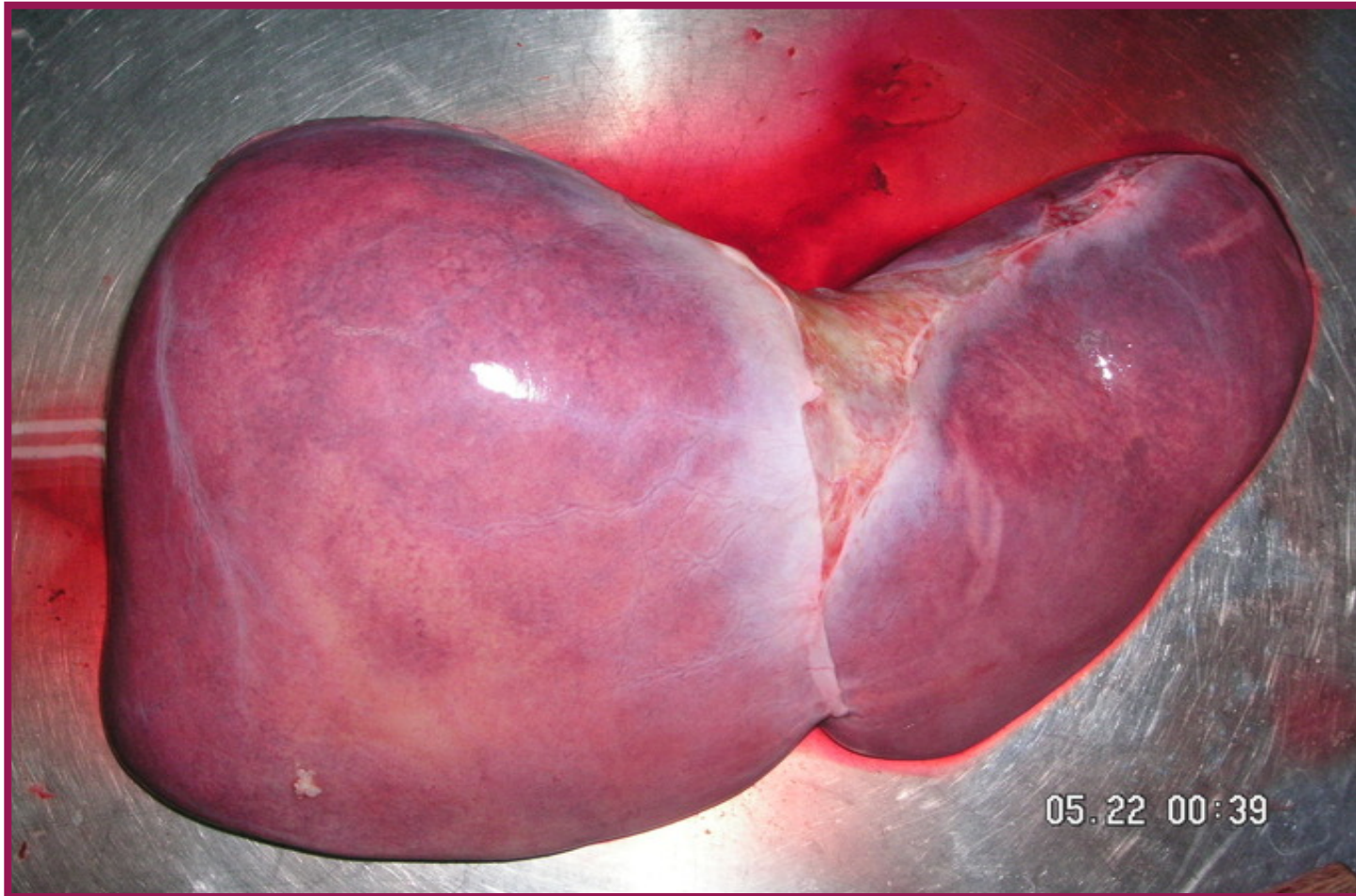
Site of pain in pancreatitis

Liver

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.

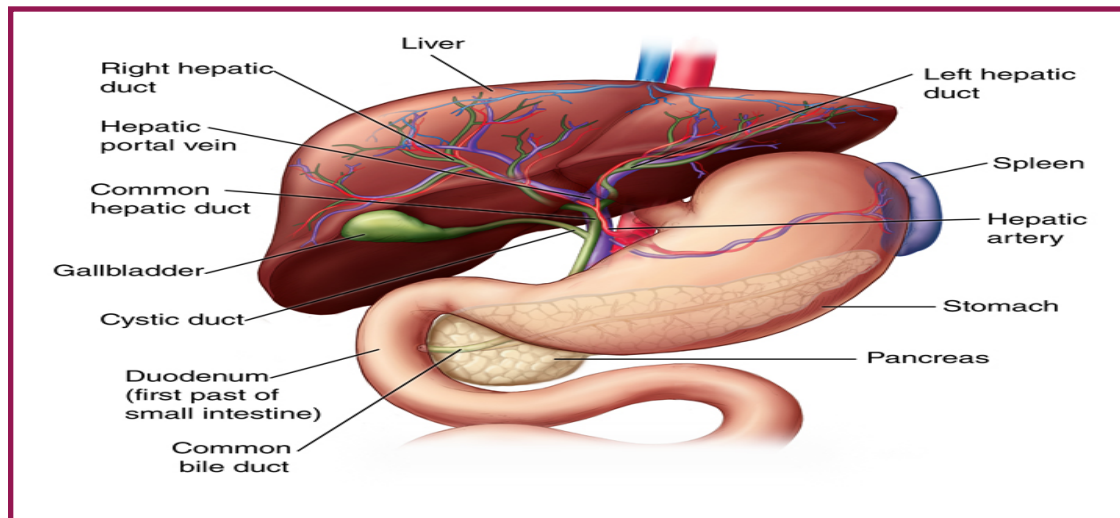


Human liver



Primary functions of the liver

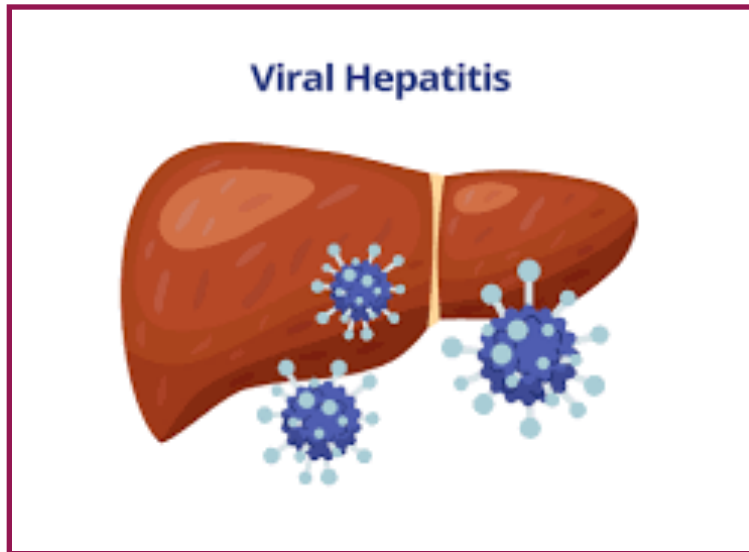
- **Bile production** and **excretion**.
- **Excretion** of bilirubin, cholesterol, hormones, and drugs.
- Metabolism of fats, proteins, and carbohydrates.
- **Enzyme activation**.
- Storage of glycogen, vitamins, and minerals.
- Synthesis of plasma proteins, such as albumin, and **clotting factors**.
- **Blood detoxification** and purification.



Common disorders of the liver

There are many kinds of liver diseases:

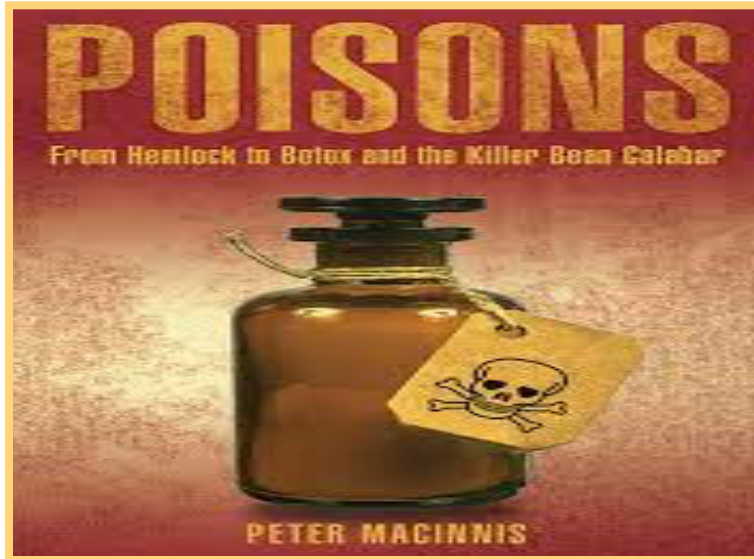
- **Diseases** caused by viruses, such as hepatitis A, hepatitis B, and hepatitis C, leading to jaundice



Common disorders of the liver

There are many kinds of liver diseases:

- **Diseases caused by**
 - ▶ drugs,
 - ▶ poisons, or
 - ▶ too much alcohol.



Common disorders of the liver

Examples include fatty **liver disease** and cirrhosis.



Cirrhotic liver



Cirrhosis leading to ascites

Youtubes

- <https://www.youtube.com/watch?v=lvQVUzcd1q8>
- <https://www.youtube.com/watch?v=24bDv-gEK8w>
- <https://www.youtube.com/watch?v=TbsD5nXyyR0>
- <https://quizlet.com/166875113/organs-in-9-regions-of-abdomen-flash-cards/>



Thank You

