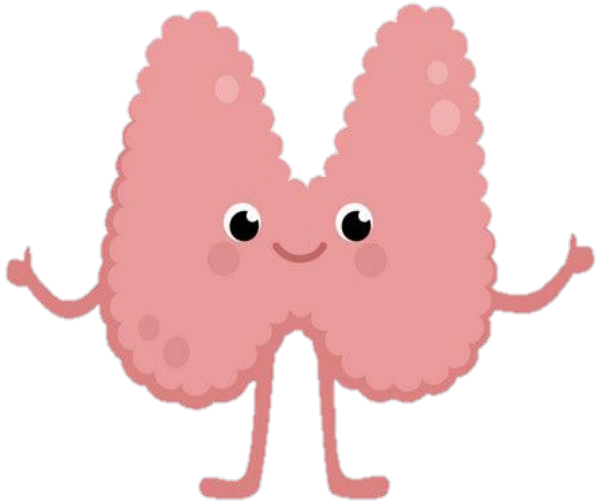
Anatomy of Pancreas



Endocrine block-Anatomy-Lecture 4

Editing file

MED438
KING SAUD UNIVERSITY

Anatomy team
med 438

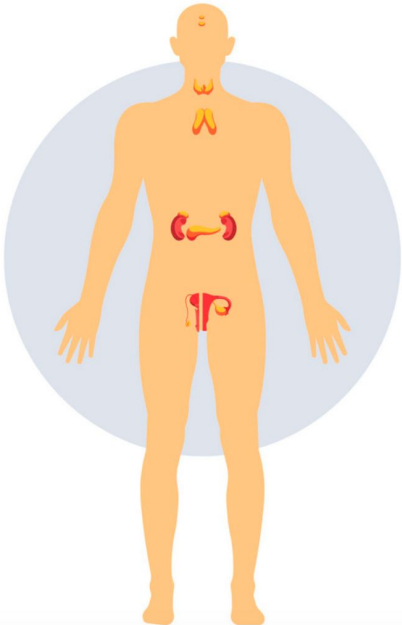
Reviewed by Razan AlRabah & Ibrahim AlDakhil

Objectives

Color guide :
Only in boys slides in Green
Only in girls slides in Purple
important in **Red**
Notes in Grey

🍎 At the end of the lecture, students should be able to:

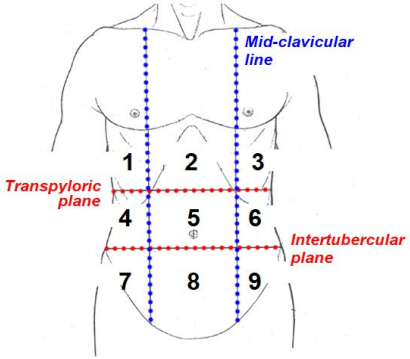
- Describe the anatomical view of the pancreas regarding to: location, parts ,relations, ducts
- Arterial supply & Venous drainage
- Describe the nerve supply and lymph drainage



Pancreas

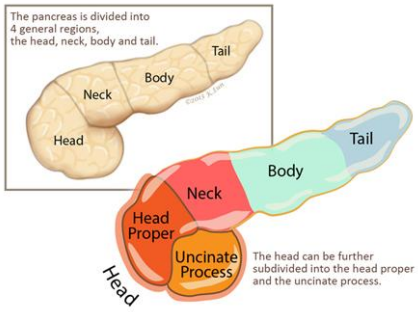
1 Location

1. The greater part is Retroperitoneal structure, behind the lesser sac.
2. it **lies** on the posterior abdominal wall in the Epigastrium & Left upper quadrant of the abdomen.
3. It **extends** in a transverse oblique direction at the transpyloric plane (1st lumbar vertebral) from the concavity of the duodenum on the right to the hilum of the spleen on the left. opposite (T12– L3)
4. because of its oblique direction the tail is higher than the head (at T12).



2 Shape

- The pancreas is "J"-shaped or RETORT shaped being set obliquely.
- It is Lobulated Because it is surrounded by a fibrous tissue capsule from which septa pass into the gland and divide it into lobes. The lobes are divided into lobules.



3 Size

- It is an elongated soft pinkish structure
- weight :(60-100) gram
- length: (6-10) inch (12–15) cm

4 Parts

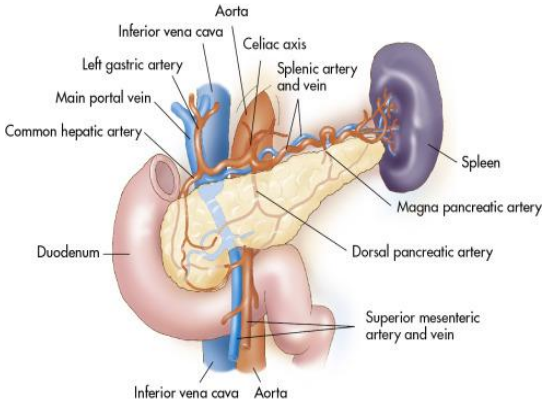
- It is divided into: •Head •Neck • Body •Tail.

Parts of Pancreas

Head of pancreas

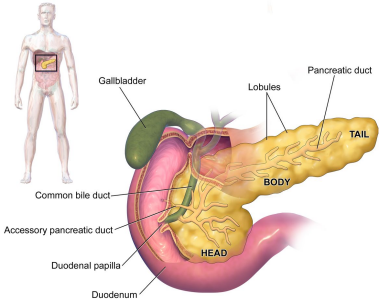
is the enlarged and disc shaped right end of the pancreas with one process called uncinate process

- Lies within the concavity of the C-shaped duodenal loop in front of L2)
- Related to the 2nd and 3rd portions of the duodenum.
- On the left, it emerges into the neck.
- On the right, it Includes **Uncinate Process** (an extension of the lower part of the head behind the superior mesenteric vessels



Relations

Anterior surface	Posterior surface	Unicate process
1. The gastroduodenal artery, 2. transverse colon, 3. root of the transverse mesocolon 4. jejunum.	1. IVC (runs upwards.) 2. left renal vein 3. bile duct (runs downwards and may be embedded in it. (tumor of the head will compression on bile duct lead to obstruction jaundice) 4. right crus of diaphragm	• **Anterior**: superior mesenteric vessels • **Posterior:** abdominal aorta.



Parts of Pancreas

Neck of pancreas

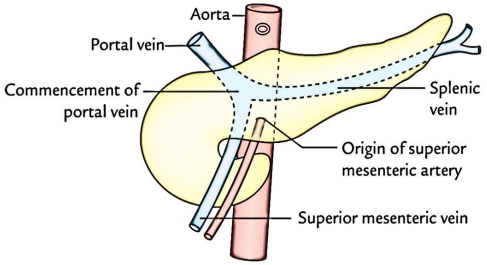
- It is the constricted portion connecting the head & body of pancreas
- best defined as "narrow band of pancreatic tissue Lies in front of superior mesenteric and the portal vein"

Relations

Posterior

1. Aorta
2. Origin of Superior Mesenteric artery
3. the confluence of the Portal Vein

Antero-superior: supports the pylorus of the stomach
inferior border: The superior mesenteric vessels emerge

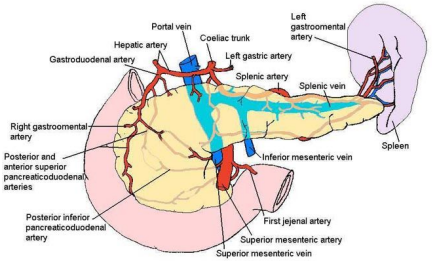


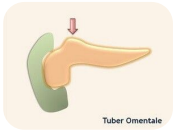
Body of pancreas

- It is triangular in cross sections and it runs upward and to the left
- lies in front of the vertebral column at or just below the transpyloric plane.
- has one process: Tuber omentale (above the lesser curvature of the stomach and comes in contact with the lesser omentum across the lesser sac).

Relations

Upper border: Splenic Artery runs to the left along the borders
Posterior Surface: Splenic Vein is embedded in it

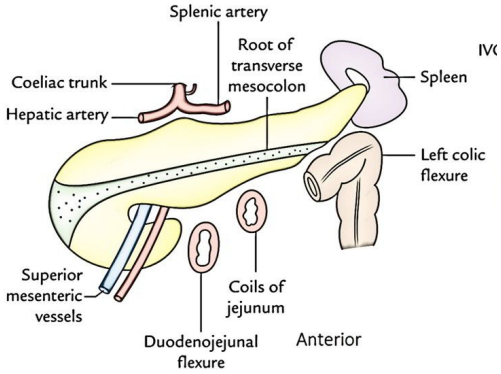




Parts and Relations of Pancreas

Tail of pancreas

- A narrow, short segment Ends within the splenic hilum and it It is mobile unlike the other major retroperitoneal parts of the gland.
- **Lies** in the Splenicorenal (lienorenal) ligament (may get injured during splenectomy) along with splenic vessels, at the level of the T12 vertebra
- Contains the largest number of **islets of Langerhans**



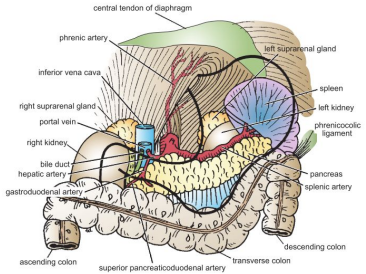
Relation

Anteriorly: splenic flexure of colon (May be injured during Splenectomy)

Relations of Pancreas

Anterior (to body and tail)

- Stomach separated by lesser sac
- Transverse colon
- transverse mesocolon



Posterior (to body and tail)

- Bile duct
- portal
- splenic veins,
- inferior vena cava
- aorta & origin of superior mesenteric artery.
- Left psoas muscle
- left renal vessels
- left kidney
- left adrenal gland
- Hilum of the spleen.

Supply of Pancreas

Arterial supply

Head and Neck:

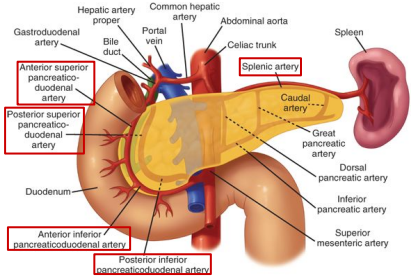
- Celiac trunk to common hepatic to gastroduodenal to **superior pancreaticoduodenal artery**
- Superior mesenteric to **Inferior pancreaticoduodenal**

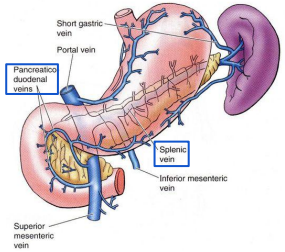
Body and Tail:

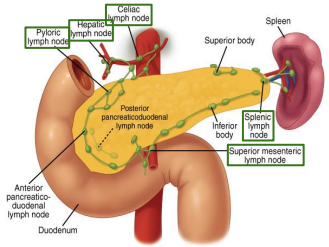
- Splenic artery (main artery) through about 8-10 branches

Nerve supply

- **Sympathetic fibers:** from the thoracic splanchnic nerves they have a predominantly inhibitory effect.
- **Parasympathetic fiber**: from the Vagus. they stimulate both exocrine and endocrine secretions







Venous drainage

Head and neck (body)

- Anterior and posterior arcades drain that form superior and inferior pancreaticoduodenal veins which follow the corresponding arteries

Body and Tail

- Splenic vein drains which is a tributary of the **portal vein**

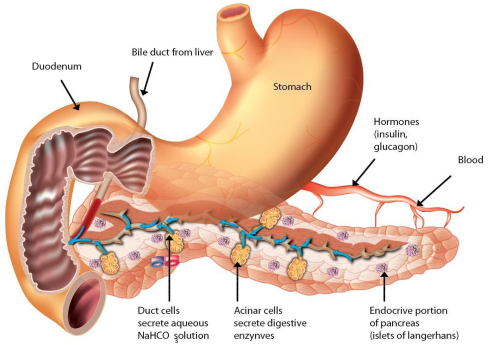
Lymphatic drainage

- Rich network drains into nodes along the upper border of the pancreas called
  1. Pyloric
  2. Hepatic
  3. Splenic nodes
- Ultimately the efferent vessels drain into
  1. celiac
  2. superior mesenteric lymph nodes.
- Lymph vessels from the region of the Head pass to Superior Mesenteric nodes

Function of Pancreas

The Exocrine portion

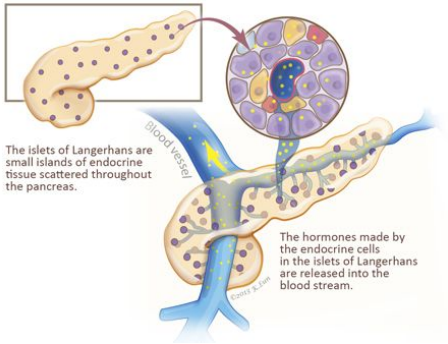
- Small ducts arise from the lobules and enter the main pancreatic duct (which begins in the tail), and passes through the body and head where it meets the bile duct.
- makes and secretes digestive enzymes into the intestine (Exocrine pancreas)
- comprise more than 95% of the pancreatic mass



Function

The Endocrine portion

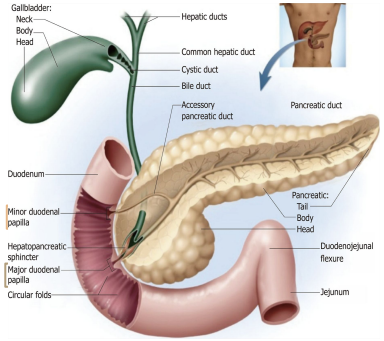
- (Islets of Langerhans) produce insulin, glucagon and somatostatin.
- control energy metabolism and storage throughout the body
- comprise 1-2% of pancreatic mass



Pancreatic ducts

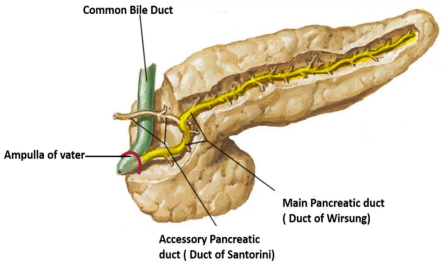
Main pancreatic duct (of Wirsung)

- runs the entire length of pancreas beginning from the tail.
- It drain whole pancreas except upper portion of the head i.e. tail,body, neck, inferior portion of head & uncinate process.
- Joins common bile duct & they open into a small hepatopancreatic ampulla in the 2nd part of duodenal wall hepatopancreatic ampulla (Ampulla of Vater).
- The ampulla opens by a narrow mouth into the lumen of the duodenum through (Major Duodenal Papilla).



Accessory pancreatic duct (of Santorini)

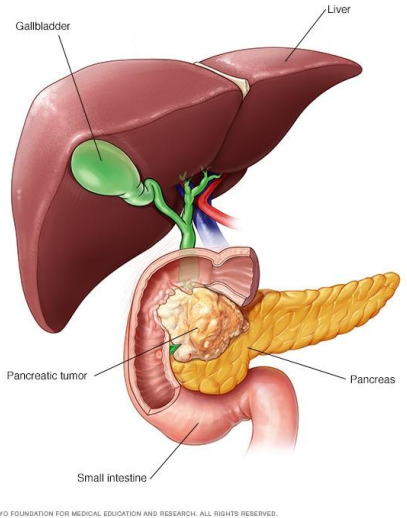
- Drains superior portion of the head
- It empties separately into 2nd portion of duodenum at (minor duodenal papilla) about 2–3 cm above the opening of main pancreatic duct (6–8 cm distal to pylorus)



Clinical Anatomy

Carcinoma of the head of pancreas

- Is common.
- Compresses the bile duct leading to persistent
- obstructive jaundice.
- May press the portal vein or may involve the stomach due to close vicinity of these structures to the head of pancreas



Acute pancreatitis

- Is the acute inflammation of the pancreas.
- Occurs due to obstruction of pancreatic duct, ingestion of alcohol, viral infections (mumps), or trauma.
- It is serious condition because activated pancreatic enzymes leak into the substance of pancreas and initiates the autodigestion of the gland.
- **Clinically**, it presents as very severe pain in the epigastric region radiating to the back, fever, nausea, and vomiting.

QUIZ

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
B	A	C	B	B	D	A	B

Q1: Which part of the pancreas is drained by the splenic vein?

A.Head

B.Body

C. Neck

D. Uncinate Process

Q2: Which of the following structures runs inferior to the neck of the pancreas?

A superior mesenteric vessels

B. Renal arteries

C. Aorta

D. Inferior phrenic

Q3: The tail of the pancreas runs in which of the following structures?

A. Greater omentum

B. Gastrosplenic ligament

C. Splenorenal ligament

D. lesser omentum

Q4: The stomach is separated from the tail of pancreas by which one of the following ?

A. Lesser omentum

B. Lesser sac

C. Greater omentum

D. Splenorenal ligament

Q5: Which part of the pancreas may be injured in a splenectomy procedure?

A. .Body

B. Tail

C. head

D. neck

Q6: The Tuber omentale is an extension of:

A. The tail

B. The upper part of head

C. The lower part of head

D. The body

Q7: The splenic vein is embedded in which one of the following pancreatic segments?

A. Body

B. Head

C. Neck

D. Tail

Q8: The ampulla of vater opens into the duodenal lumen through:

A. Minor duodenal papilla..

B. Major duodenal papilla.

C. Duct of Santorini.

D. bile duct

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