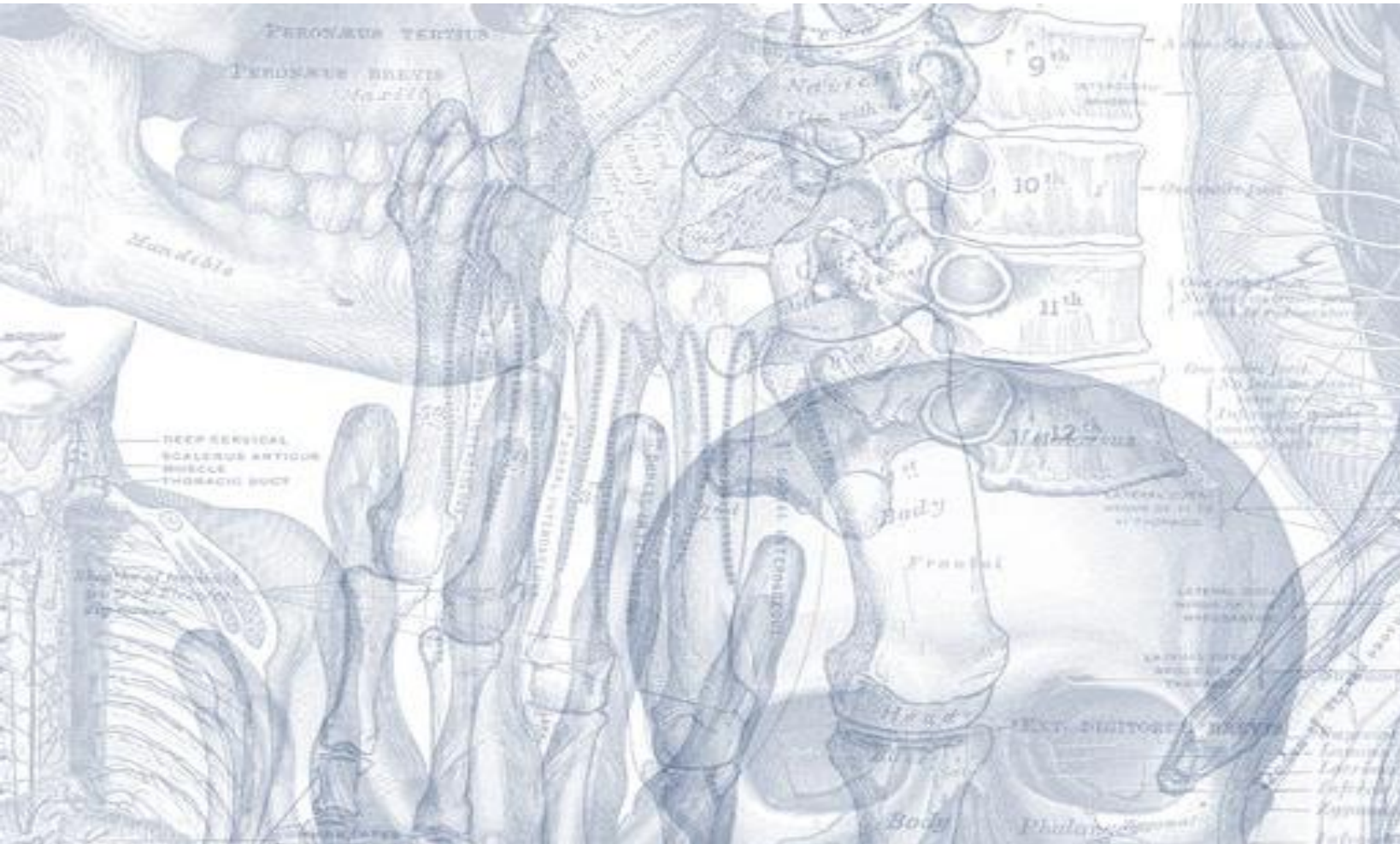


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Anatomy of the Pancreas

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Color Code

- **Important**
- **Doctors Notes**
- **Notes/Extra explanation**

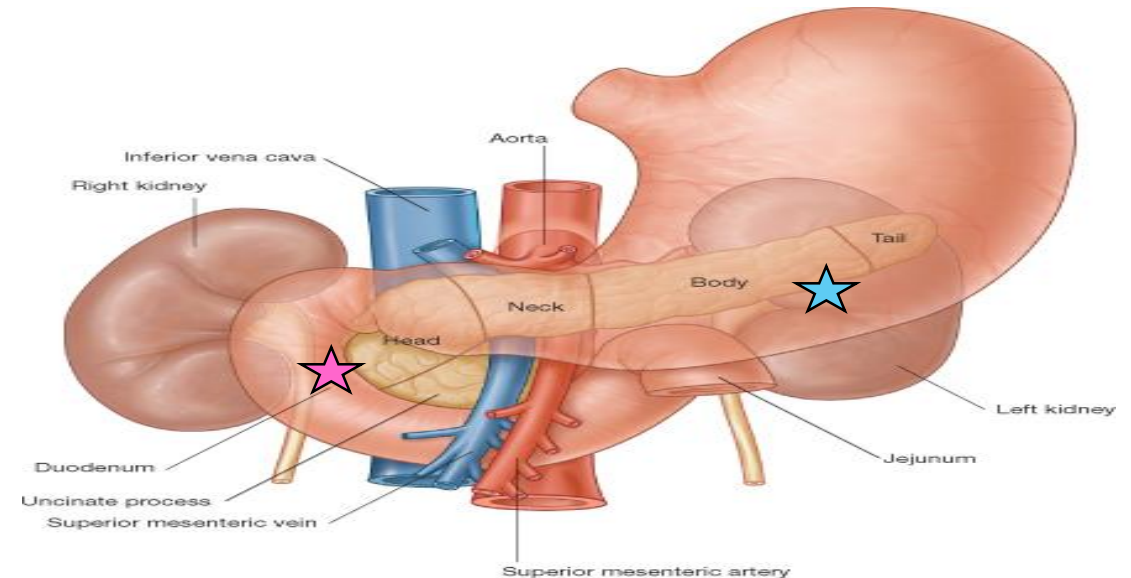
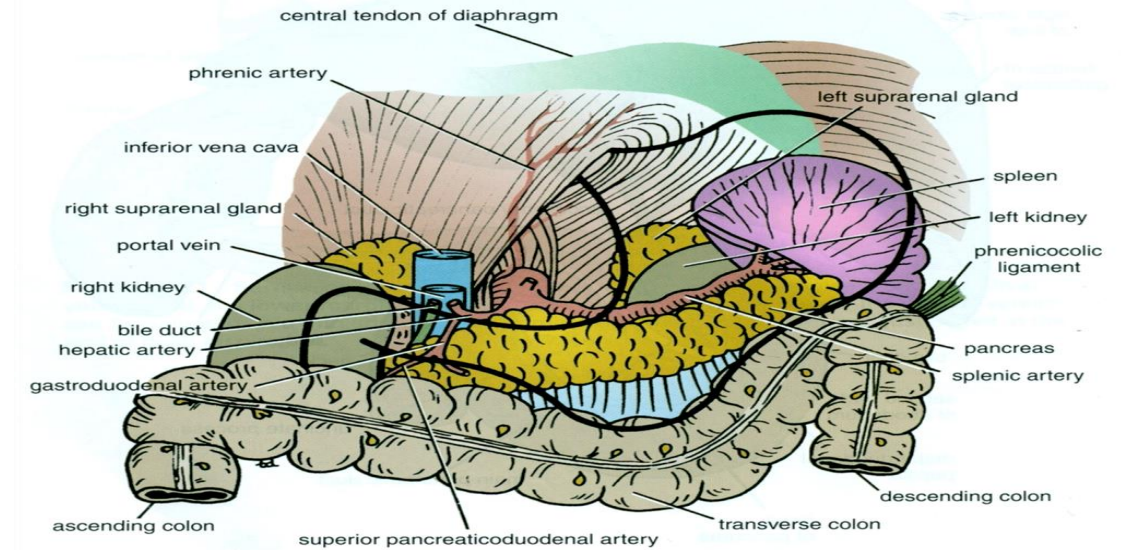
Objectives

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

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

Pancreas

Introduction	<ul style="list-style-type: none"> It is an elongated soft pinkish structure (60-100) gram in weight & (6-10) inch in length Why is it Lobulated? Because it is surrounded by a fibrous tissue capsule from which septa pass into the gland and divide it into lobes. The lobes (فصوص) are divided into lobules (فصيصات). Lobulated structures are hard to manage during surgery.
Location	<ul style="list-style-type: none"> It is a Retro-Peritoneal* structure. It lies on the posterior abdominal wall in the: Epigastrium & Left upper quadrant of the abdomen. 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 spleen on the left.
Parts	<ol style="list-style-type: none"> Head Neck Body Tail <p>L1 (transpyloric plane) T12</p> <p>Because of its oblique direction the tail is higher than the head (at T12).</p>



*meaning it is only covered anteriorly by peritoneum and posteriorly it is fixed to the abdominal wall.

Part of Pancreas

Head

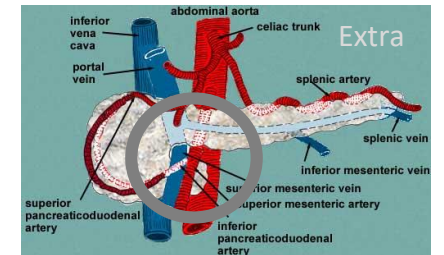
- It is disc (قرص) shaped and lies within the concavity (c-shaped part) of the duodenum
- Related to the **2nd** and **3rd** portions of the duodenum.
- On the **right**, it emerges into the **neck**.
- On the **left**, it includes **Uncinate Process**: (an extension of the lower part of the head **behind the superior mesenteric vessels so they descend in front of it**)

Structures Posterior to the Head:

1. **Bile Duct** runs downwards and may be embedded in it. (cancer of head will lead to obstructive jaundice)
2. **IVC** (inferior vena cava) runs upwards because its going to the heart.

Neck

- It is the constricted portion connecting the head & body of pancreas
- It lies in front of (posterior relations):
 1. Aorta
 2. Origin of Superior Mesenteric artery
 3. the **confluence (beginning) of the Portal Vein**
- Its **antero-superior surface** supports the pylorus of the stomach
- The **superior mesenteric vessels** emerge from its inferior border*



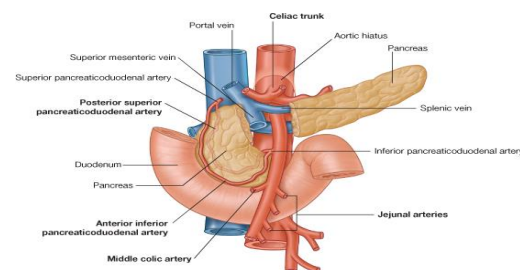
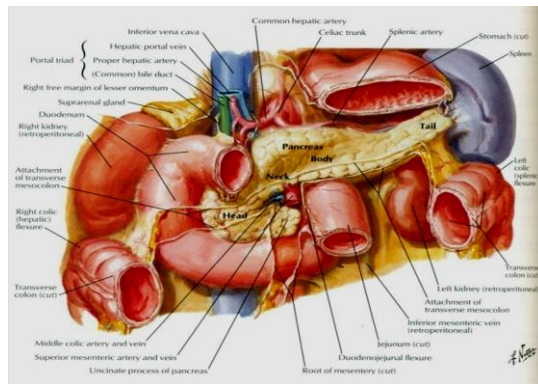
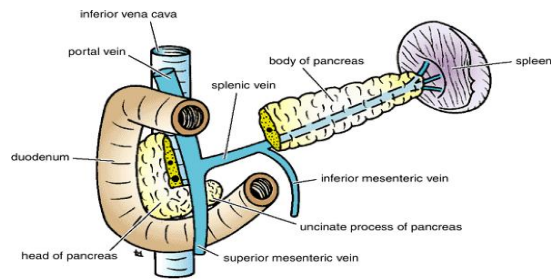
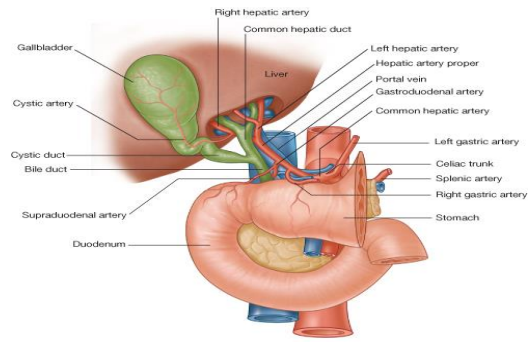
Body

- It runs upward and to the left.
- It is triangular in cross section.
- The **Splenic Vein** is embedded in its posterior surface.
- The **Splenic Artery** runs to the left (toward the spleen) along the **upper border** of the pancreas.

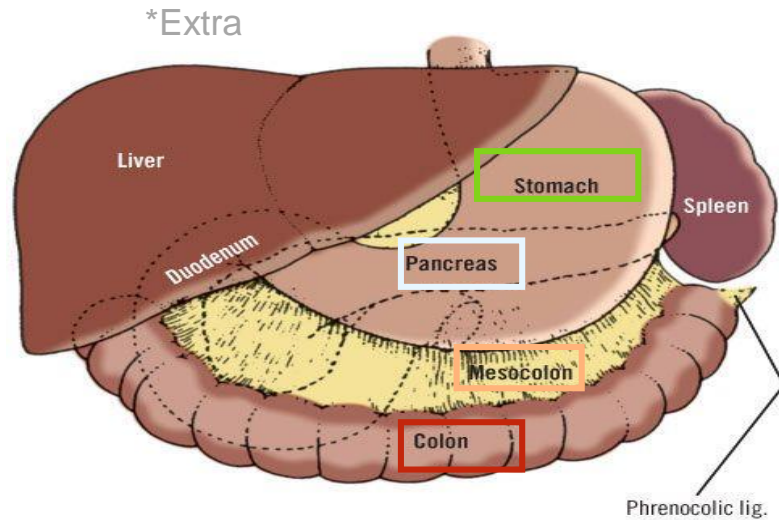
Tail

- A narrow, short segment Ends within the splenic hilum.
- Lies in the **Splenicorenal** (also called **lienorenal**) ligament.
- Anteriorly, related to: splenic flexure of colon (also called **left colic flexure**).
- May be injured during **splenectomy** which will lead to **acute pancreatitis**.

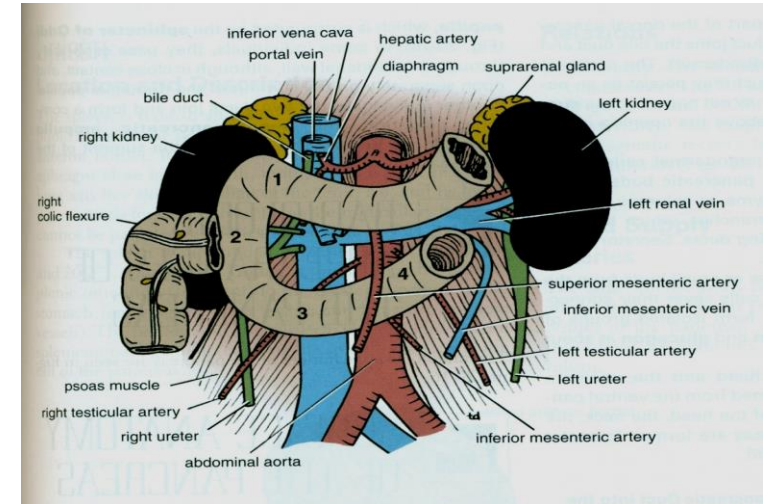
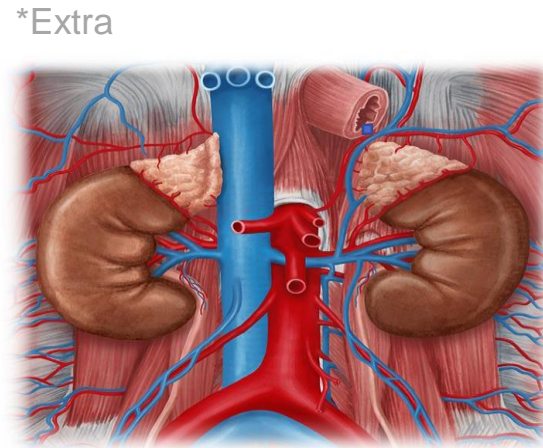
*the superior mesenteric vessels start at L1 behind the neck then they will descend and go in front of the **uncinate process**



Relations of Pancreas



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Anterior to (<i>body & tail</i>):	Posterior to (<i>body & tail</i>) :
<u>Stomach</u> separated from it by lesser sac	Left Psoas muscle
<u>Transverse colon</u> & <u>transverse mesocolon</u>	Left Adrenal gland
	Left Renal vessels
	Upper 1/3 rd of Left kidney
	Hilum of the spleen

Arterial Supply Important to know

Supplied by:

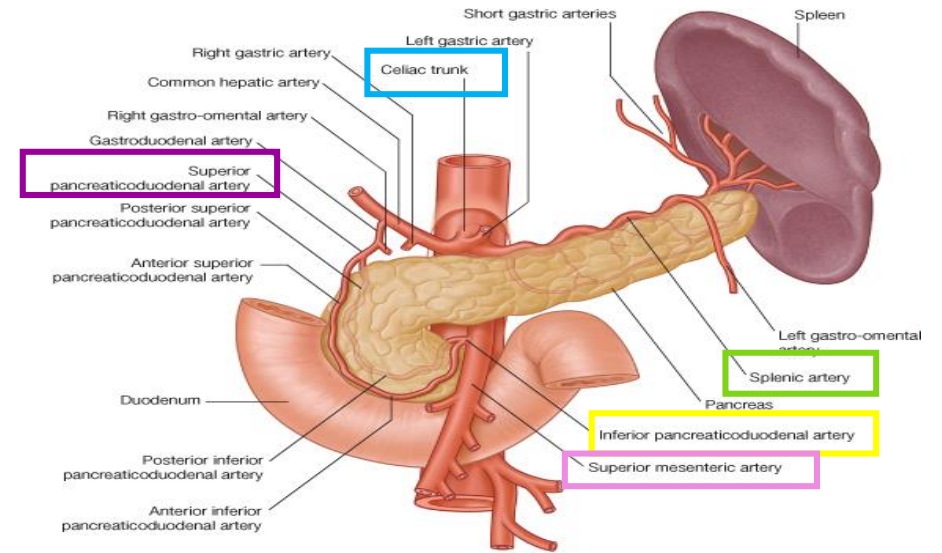
- Celiac trunk (foregut)
- Superior mesenteric artery (midgut)
- Splenic arteries (branch of celiac)

Head & Neck:

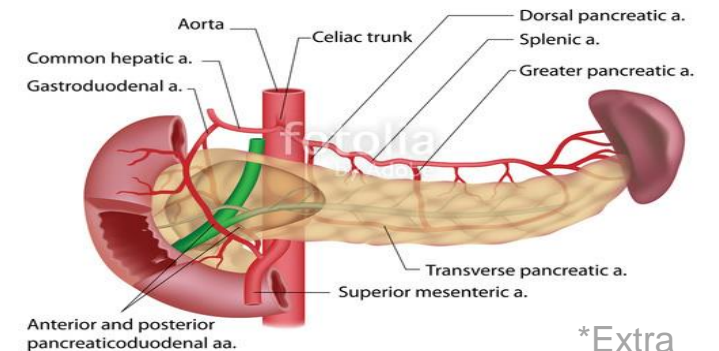
- Celiac Trunk* → Common hepatic artery (also gives Right gastric and hepatic arteries) → Gastroduodenal → Superior pancreaticoduodenal.
- Superior mesenteric → Inferior pancreaticoduodenal to head

Body and Tail:

- Splenic artery: supplies the Body and Tail of pancreas by about 10 branches



Arterial Supply of the Pancreas



*Extra
#173813499



The inferior pancreaticoduodenal is a branch of superior mesenteric.
The superior pancreaticoduodenal is a branch of gastroduodenal which is a branch of common hepatic which is a branch of celiac trunk.

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Venous drainage

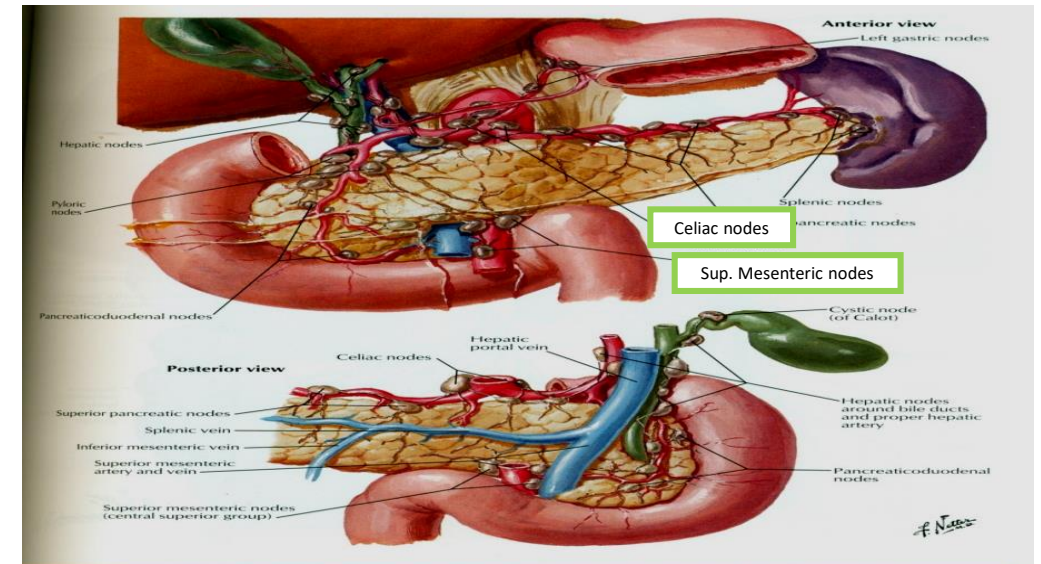
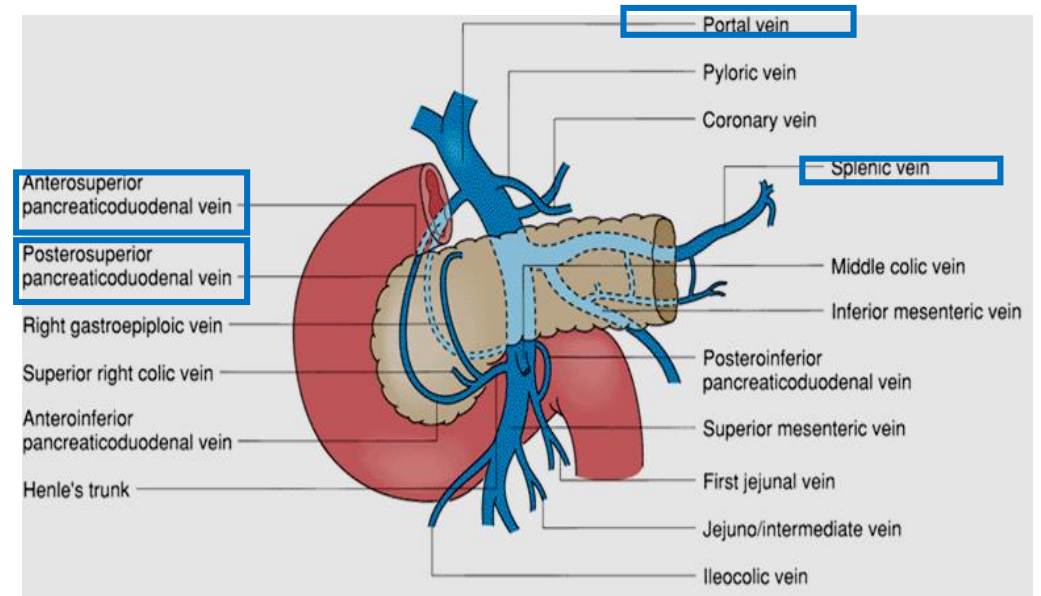
- **Anterior and posterior arcades** (the superior and inferior pancreaticoduodenal veins) drain head and the body,
- **Splenic vein** drains the body and tail.
- Ultimately, ends into **Portal Vein** by joining superior mesenteric.

Nerve supply

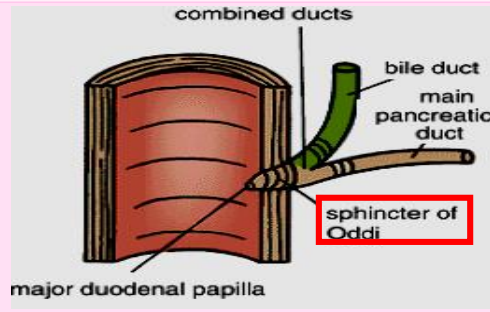
- Sympathetic: from the **splanchnic nerves**, they have a predominantly inhibitory effect
- Parasympathetic: from the **Vagus**, they stimulate both exocrine and endocrine secretions

Lymphatic drainage

- Rich network drains into nodes along the upper border of the pancreas.
- Ultimately the efferent vessels drain into the **Celiac nodes**.
- Lymph vessels from the region of the Head pass to **Superior Mesenteric nodes**

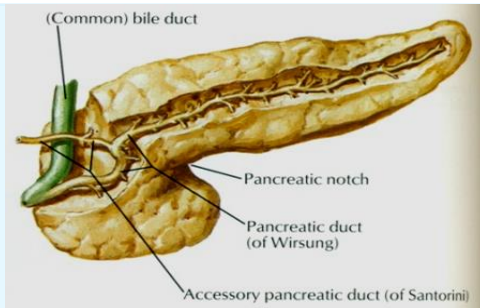


Pancreatic Ducts



Main Pancreatic duct :

- Joins common bile duct & they open into a small hepatopancreatic ampulla in the duodenal wall (Ampulla of Vater) **there is also sphincter of oddi which is a muscular valve.**
- The ampulla opens into the lumen of the duodenum (**2nd part of posteromedial wall**) through (**Major Duodenal Papilla**).

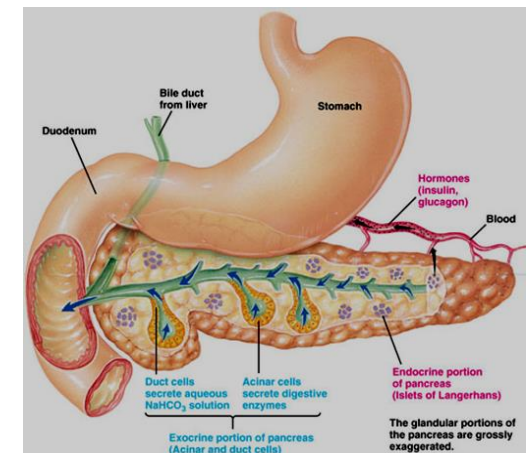


Accessory Pancreatic duct (of Santorini) :

- Drains **superior portion of the head.**
- It empties separately into 2nd portion of duodenum at (**minor duodenal papilla**) **above the major papilla.**

Functions *The pancreas is an exocrine and endocrine gland :*

- 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.
- The Endocrine portion:
(Islets of Langerhans) produce insulin & glucagon.



Pancreas

Notes

- Lobulated, **Retro-Peritoneal** organ located in **Epigastrium & Left upper quadrant** of the abdomen.

Parts

HEAD

- Related to the 2nd and 3rd portions of the duodenum on the right
- Includes uncinata process on the left (part extending to the left behind the **superior mesenteric** vessels)

NECK

BODY

TAIL

- Lies in the **splenicorenal** ligament

Levels

L1 (transpyloric plane)

T12

Relations

Posterior:

- Bile duct
- Inferior vena cava

Posterior:

- Aorta
 - Origin of **Superior Mesenteric artery**
 - Confluence of the **Portal Vein**
- Inferior border:*
- Superior mesenteric vessels
- Antero-superior:*
- pylorus of stomach

Posterior:

- Splenic vein
- Superior (upper border):*
- Splenic artery

Anterior:

- Splenic flexure of colon

Anterior:

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

Posterior

- Left **psoas** muscle, left adrenal gland, left renal vessels & upper 1/3rd of left kidney, hilum of the spleen.

Arterial

superior pancreatico-duodenal artery (**celiac**) and **inferior pancreatico-duodenal** artery (**superior mesenteric**)

splenic artery (**celiac**)

Venous

anterior and posterior arcades → **superior mesenteric** vein → **portal** vein

splenic vein → **portal** vein

Lymphatic

Superior mesenteric (drains head) and **Celiac** nodes

Innervation

Sympathetic: **thoracic splanchnic** nerves (inhibitory)
Parasympathetic: **vagus** nerve (excitatory)

Duct

Main Duct (of Wirsung): Joins common bile duct & together they open into a small hepatopancreatic ampulla (Ampulla of Vater)
Accessory Duct (of Santorini) drains superior portion of the head

MCQs

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

- A. Head
- B. Body
- C. Tail
- D. both B&C

Q2- Which of the following is related posteriorly to the body of pancreas?

- A. Splenic artery
- B. Splenic vein
- C. Stomach
- D. Transverse colon

Q3- Tail of pancreas lies at the level of?

- A. L3
- B. T11
- C. L1
- D. T12

Q4- Which one of these arteries does NOT supply the neck of the pancreas ?

- A. Celiac Trunk
- B. Superior pancreatic duodenal
- C. Splenic Artery
- D. Superior mesenteric

Q5- The stomach is separated from the tail of pancreas anteriorly by which one of the following ?

- A. Greater omentum
- B. Lesser omentum
- C. Greater sac
- D. Lesser sac

Q6- The confluence (beginning) of the Portal Vein beg?

- A. Body
- B. Tail
- C. Neck
- D. Uncinate process

Answers: 1. D, 2. B, 3. D, 4. C, 5. D, 6. C



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