GI ANATOMY 5
VASCULARIZATION OF THE
GI SYSTEM

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Diagram showing the vascularization of the GI system with labels for major blood vessels and organs, including:
- Superior Mesenteric a.
- Inferior Mesenteric a.
- Celiac a.
- Hepatic a.
- Splenic a.
- Gastric a.
- Stomach
- Spleen
- Pancreas
- Small Intestine
- Large Intestine

Key figures:
- Total Inflow: 1,500 ml/min, $P_a = 90$ mmHg
- Portal v.: 6-12 mmHg
- Total Outflow: 1,500 ml/min, $P_v = 3$ mmHg

Liver

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**Vascularization**

**Major Vessels of the Hepatic Portal System**

- **To Liver**
  - Oxygenated Blood
  - Proper hepatic artery
  - Blood from aorta

- **From small intestine**
  - Deoxygenated Blood with Absorbed Nutrients & Toxins
  - Hepatic Portal Vein
  - Superior Mesenteric Vein
  - Inferior Mesenteric Vein

- **From large intestine**
  - Celiac trunk
  - Splenic artery
  - Splenic vein
  - Spleen
- Once again, inflow to the liver involves oxygenated blood via hepatic arteries and absorbed nutrients and compounds from the GI tract via the hepatic portal veins.

- All venous drainage from the GI tract and abdominal visceral organs enters the portal system back to the liver. The overall order is as following: arteries $\rightarrow$ capillaries $\rightarrow$ veins $\rightarrow$ portal vein $\rightarrow$ hepatic sinusoids $\rightarrow$ veins $\rightarrow$ vena cava $\rightarrow$ heart.

- In contrast, the caval system is as following: arteries $\rightarrow$ capillaries $\rightarrow$ veins $\rightarrow$ vena cava $\rightarrow$ heart. Obviously, this is the circulatory system within the rest of the body.

- The portal and caval system are not exclusive from each other. There are 4 sites of portocaval anastomoses:
  - 1) esophageal veins
  - 2) paraumbilical veins
  - 3) rectal veins
  - 4) retroperitoneal veins

- If there is liver damage or cirrhosis – accumulation of fibrous tissue that constricts the sinusoids – there may be portal hypertension. This may lead to varicose veins at the 4 sites of anastomoses.
Figure 5-13 Branches of the superior and inferior mesenteric arteries.

Figure 5-14 Portal venous system.
Tenesmus: urge to have a bowel movement, but only a small amount of stool produced (may not have anything to do with GI)

· Jaundice: may be from liver, but could have other sources

· Hemoptysis: spitting blood

· Hematemesis: vomiting blood. Could be produced by bleeding ulcers, esophageal varices (d/t portal hypertension)

· Hematochezia: passing fresh blood from the rectum, with or without stool

· Melena: black, tarry stool: from upper GI bleed. Can also occur from lung condition where there is hemoptysis, patient swallows blood, ends up as melena.