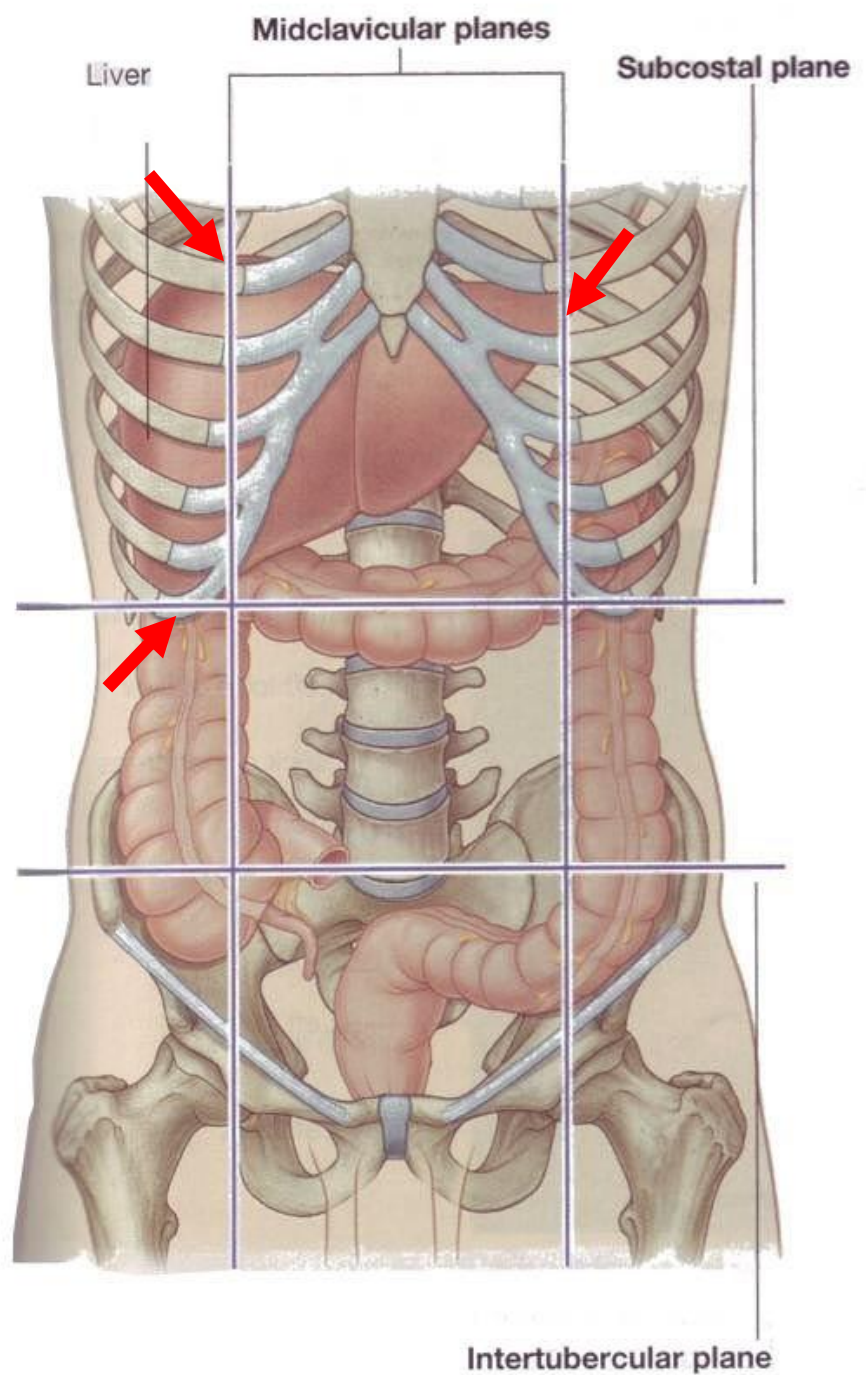
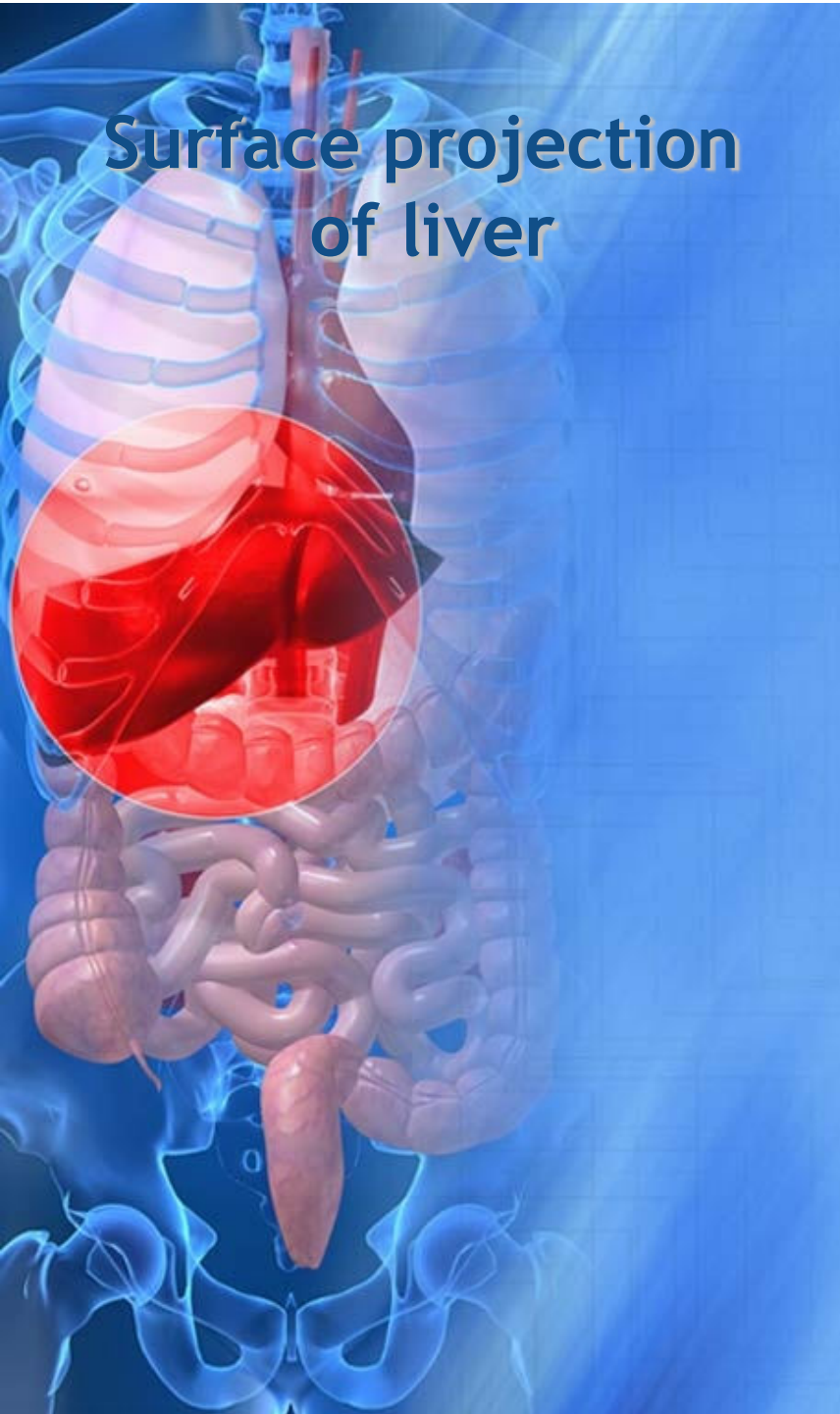


Surface projection of liver

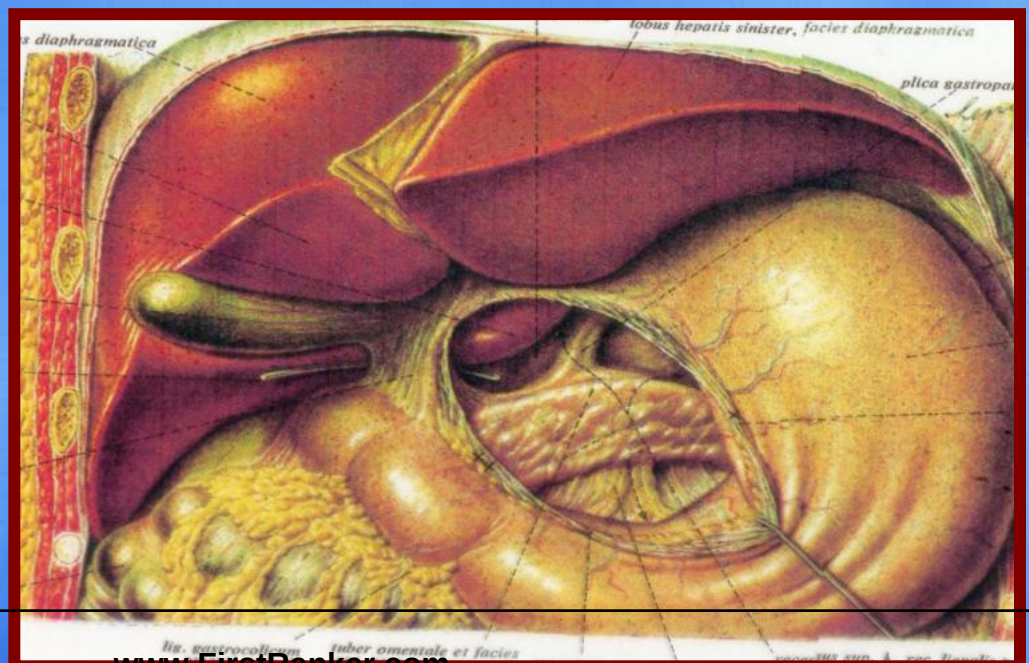


LIVER - HEPAR

**Largest Gland, exocrine secretion (bile),
metabolic functions**

**Weight - 1.6 kg , fragile tissue, 1.3kg females,
Reddish Brown C.**

**Newborn - 5% of body weight, Adult - 2.5% of body wt
Shape- wedge, four sided pyramid
laid on one side.**



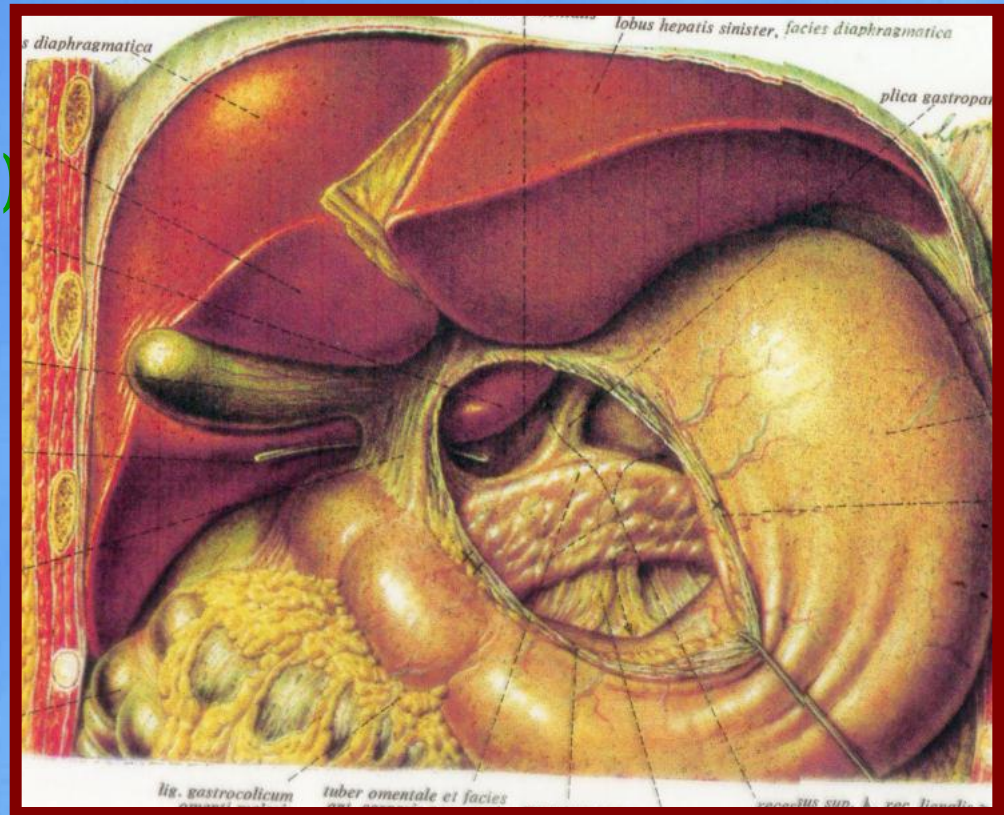
LIVER - HEPAR

Position: right diaphragmatic dome --- left medioclavicular line
Rt. Hypochond. - epigastric- Lt.hypochond.

Five surfaces- Ant., Post., Sup., Inf. & Right.

Coverings of the liver

1. T. SEROSA (X area nuda)
= visceral peritoneum
2. FASCIA GLISSONI



DIAPHRAGMATIC SURFACE

Two lobes - right and left l.

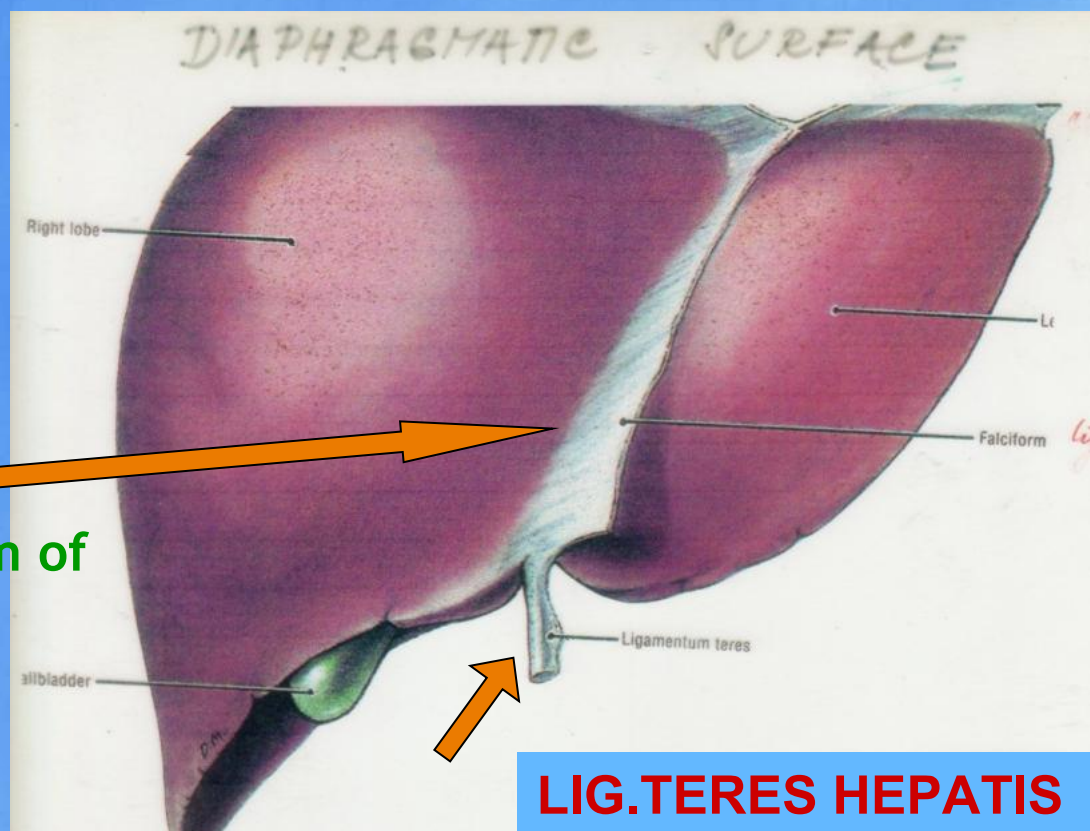
Ligaments:

Lig. teres hepatis
- obliterated umbilical vein

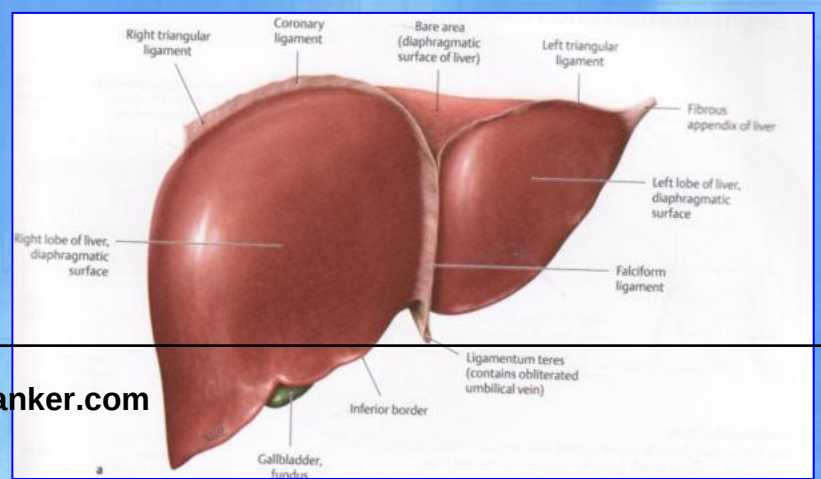
ligament falciforme hepatis
(attachment to the peritoneum of anterior abdominal wall)

Coronary hepatic lig.
Triangular hepatic lig.

„BARE AREA“ („Area nuda“) - not covered by peritoneum, fused with diaphragm, bordered by ligaments

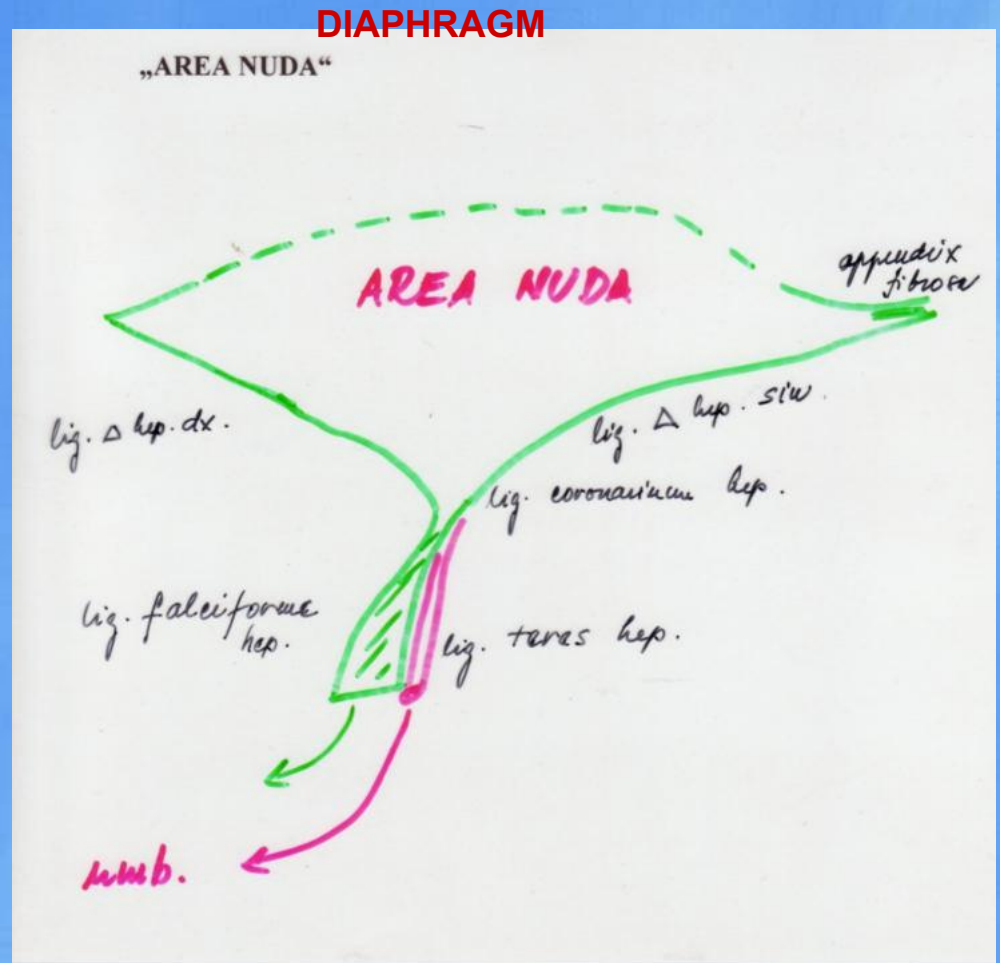


LIG. TERES HEPATIS



Ligaments:

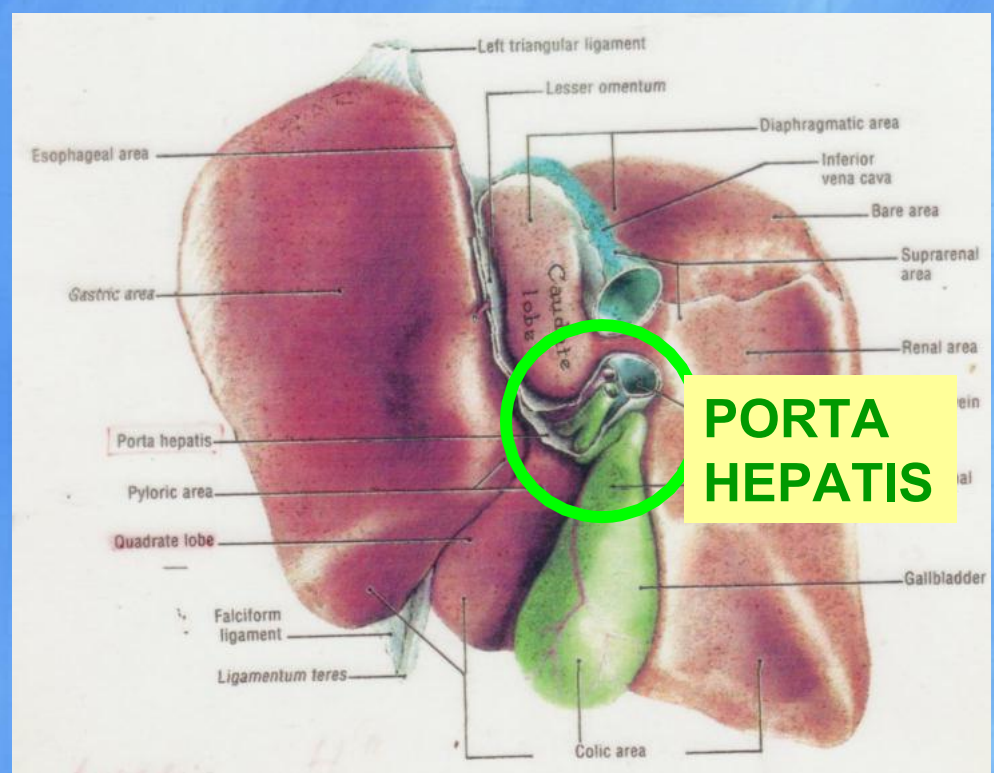
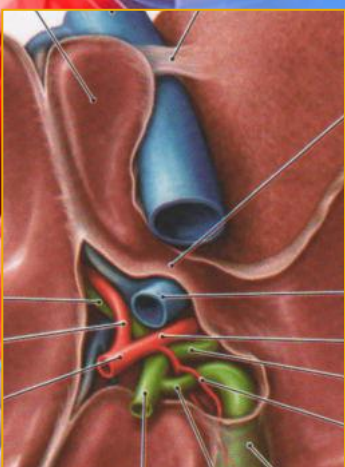
- Lig. teres hepatis - obliterated umbilical vein
- Falciform hepatic ligament (attachment to the peritoneum - of anterior abdominal wall)
- Coronary hepatic lig.
- Triangular hepatic lig.



VISCERAL SURFACE

LOBES :

1. Lobus dexter - right lobe
2. l. sinister - left l.
3. l. caudatus - caudate l.
4. l. quadratus - quadrate l.



Borders among lobes - fissures

„H“
Imprints of surrounding organs:

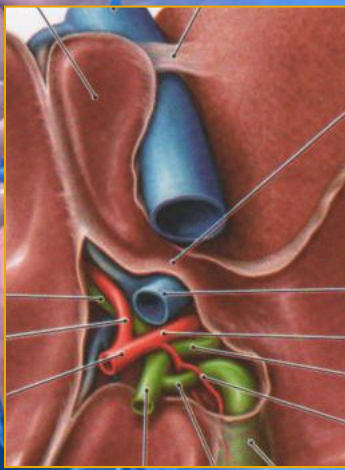
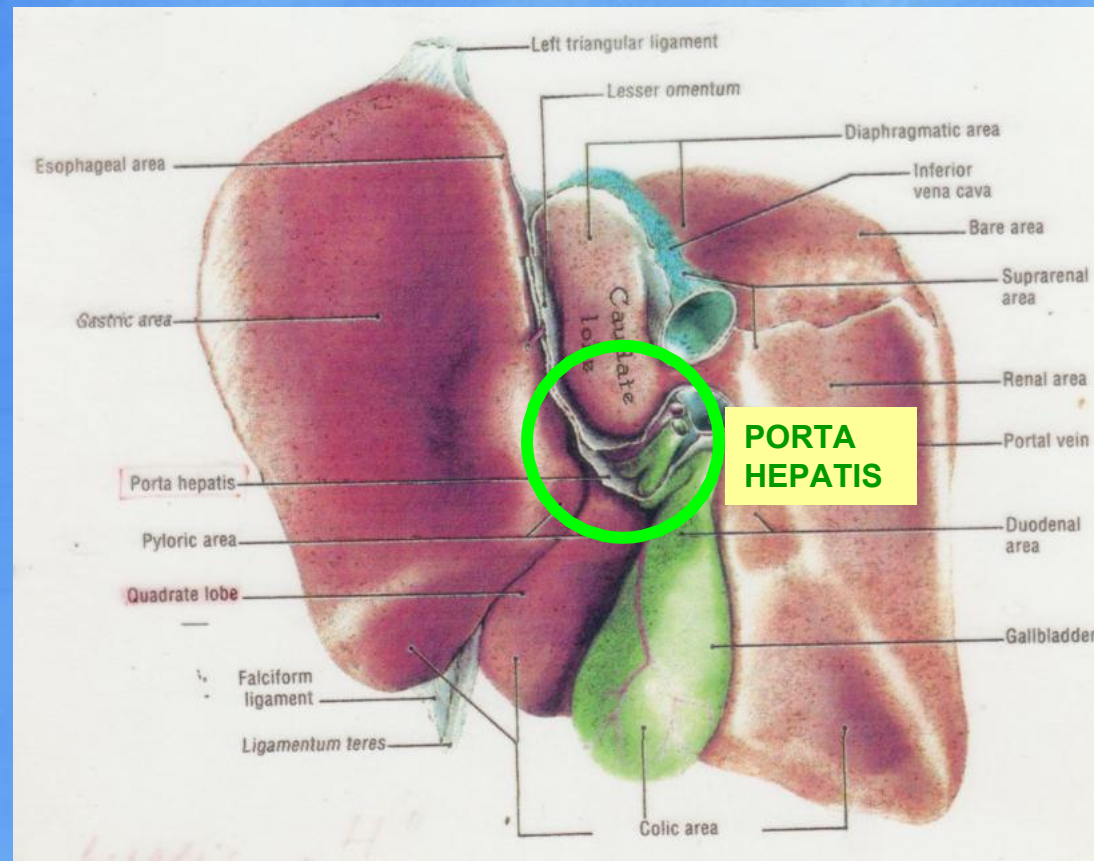
Right lobe-

duodenum, right kidney and suprarenal gland,
right colic flexure

Left lobe -

stomach, oesophagus

Caudate Lobe : post. Surf.
Rt. - Groove fr IVC
Lt.- Fissure fr Lig. Ven.
Inf.- Porta hepatis

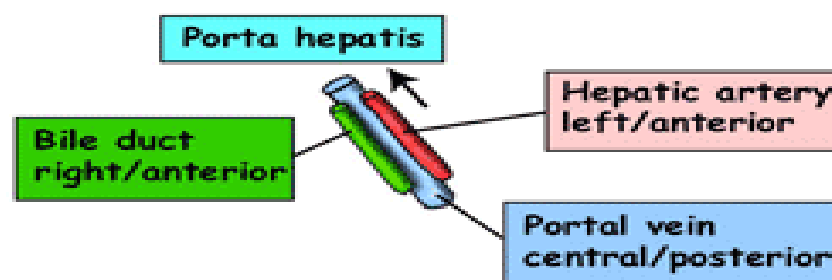


Quadrate Lobe : Inf. Surf.
Ant. - Inf. Border
Post.- Porta hepatis
Rt.-fossa fr G.B.
Lt.- Fissure fr Lig. Teres

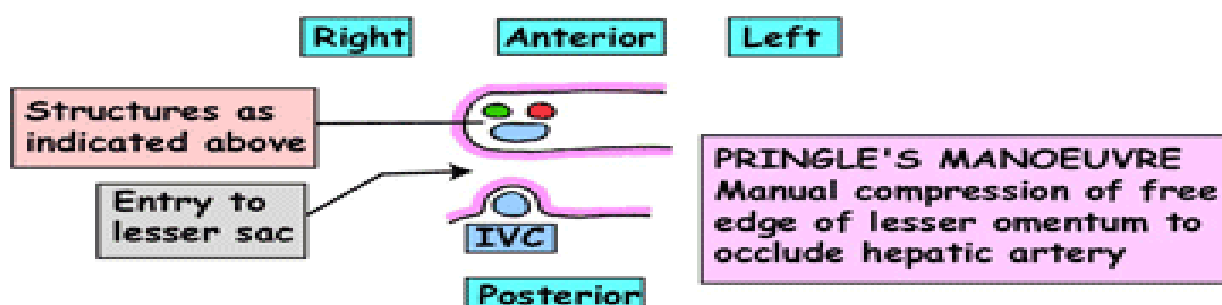
LIVER - PORTA HEPATIS

The **porta hepatis** is the area on the under surface of the liver at which the structures in the free edge of the lesser omentum enter/leave the liver. Peritoneum is reflected around it. It contains the following structures:

- Portal vein
- Left/right branches of hepatic artery
- Left/right hepatic ducts
- Lymphatics and lymph nodes
- Autonomic nerves



Cross (axial) section of free edge of lesser omentum looking up



PORTA HEPATIS - hepatic triad

Inf. Surface

Deep, Transverse fissure, 5 cm long.
Between Caudate l. & Quadrate l.

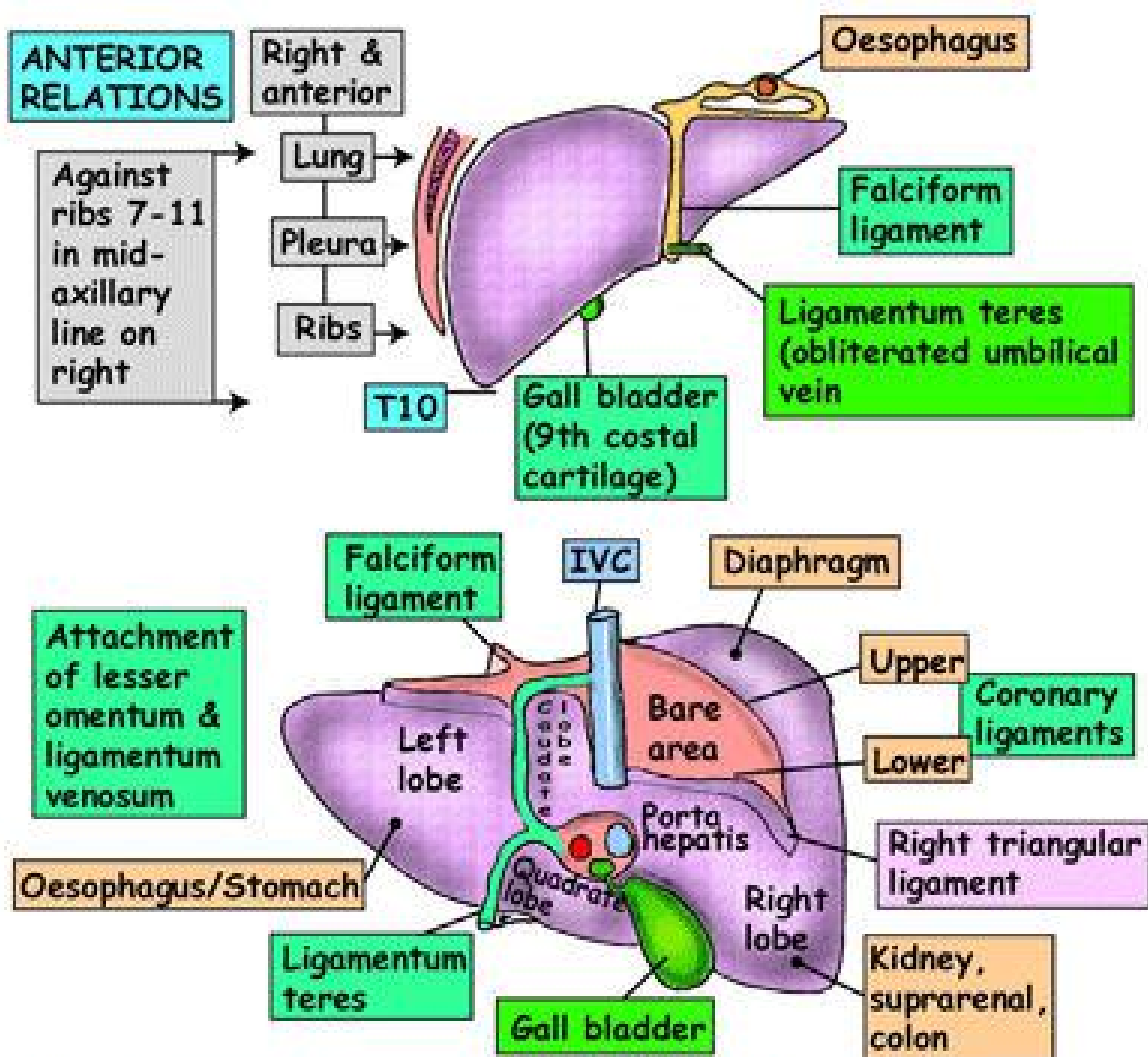
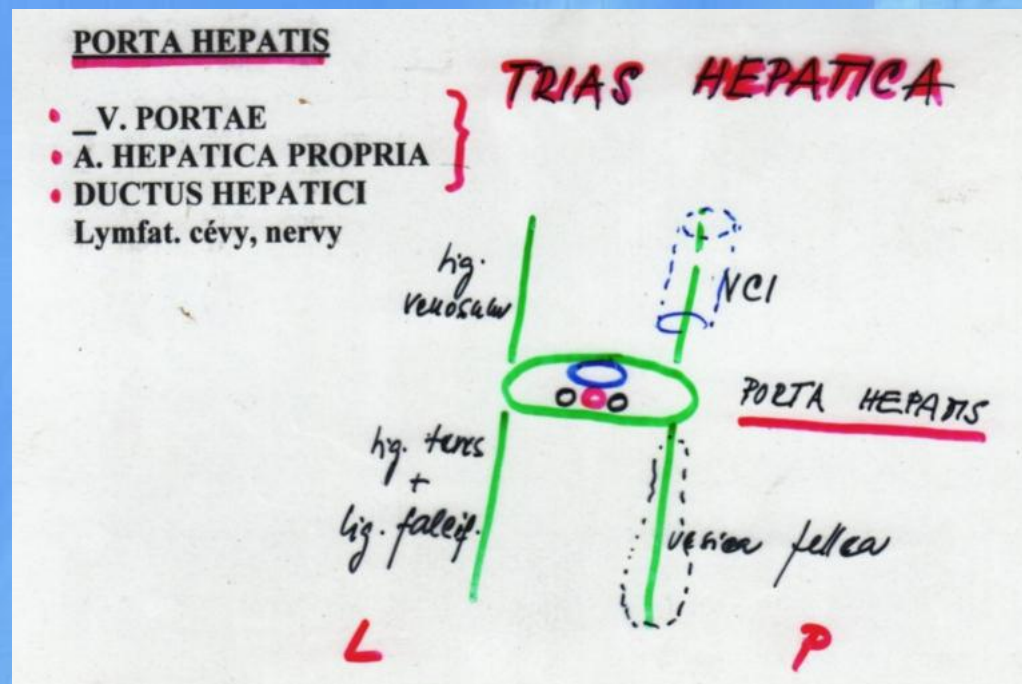
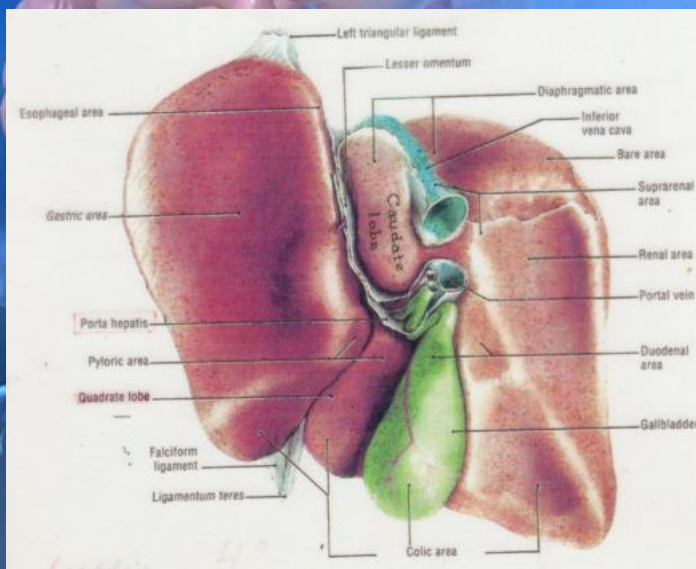
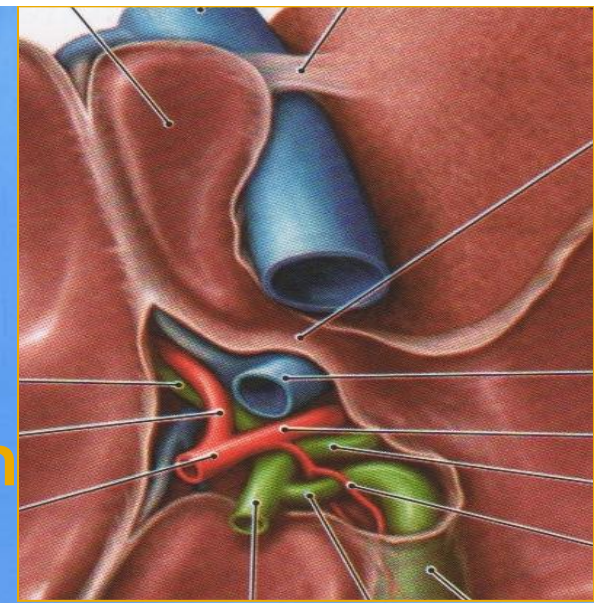
1. PORTAL VEIN

2. PROPER HEPATIC ARTERY (branch common HA)

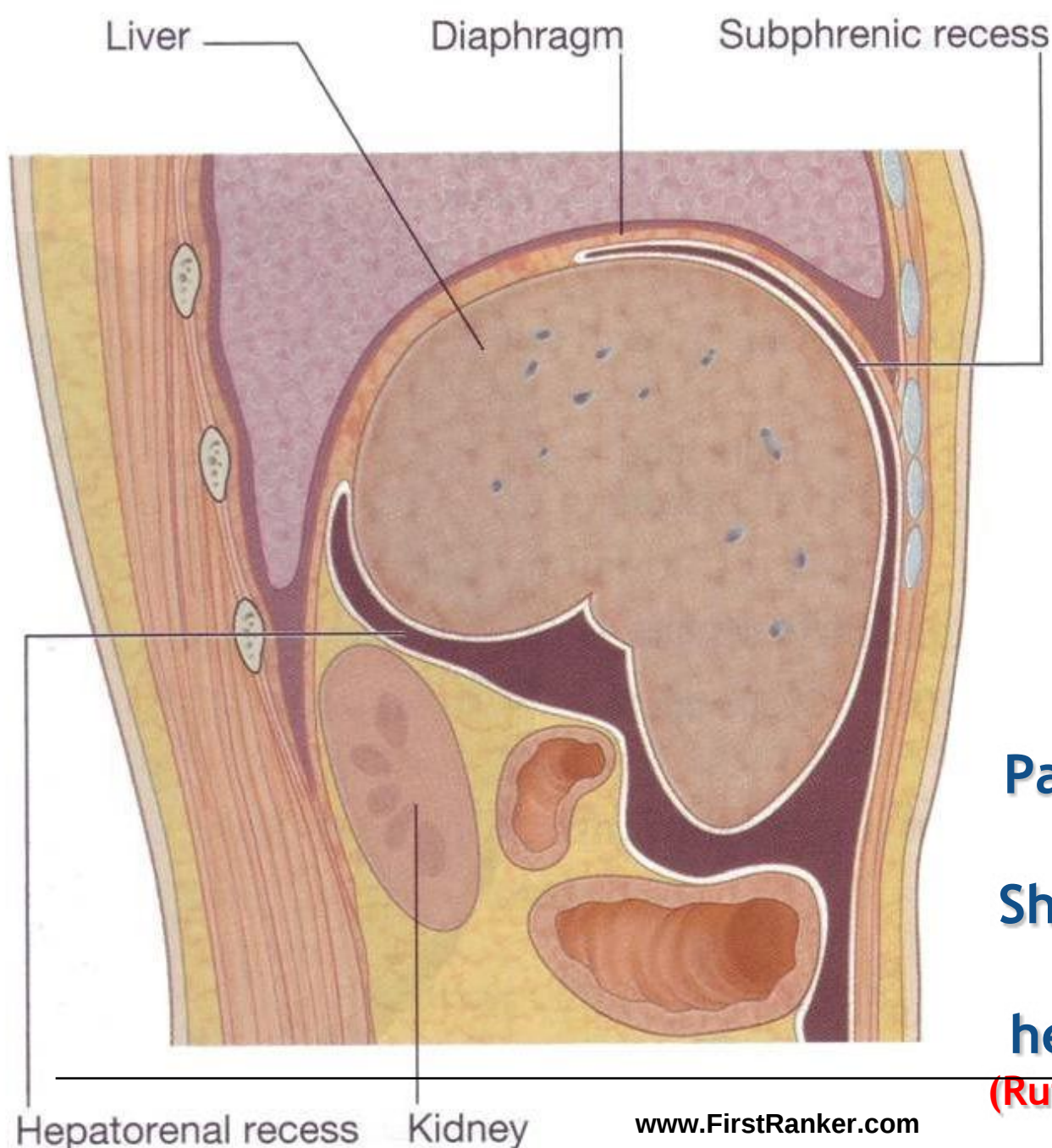
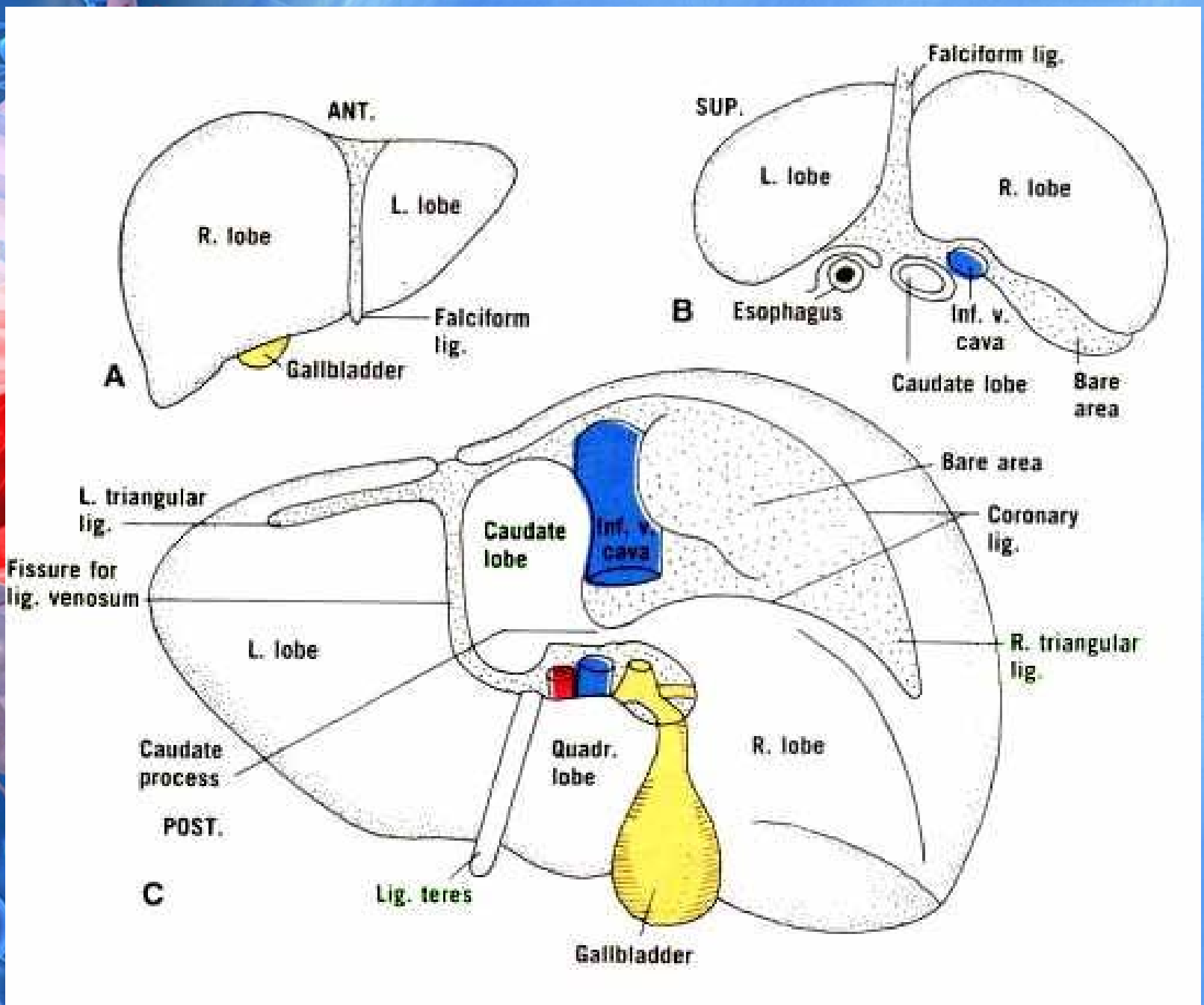
3. Hepatic plexus of nerves

4. RIGHT and LEFT HEPATIC DUCT

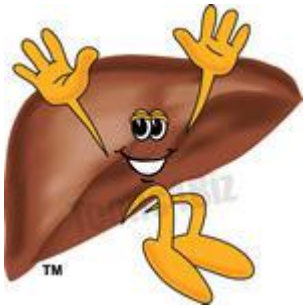
- lymphatics, - vegetative nerve



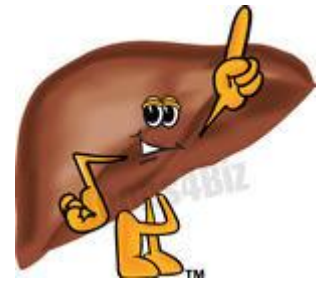
INFERIOR SURFACE SEEN FROM ABOVE



**Parasagittal section
through liver
Showing subphrenic
recess and
hepatorenal recess
(Rutherford-Morison pouch)**

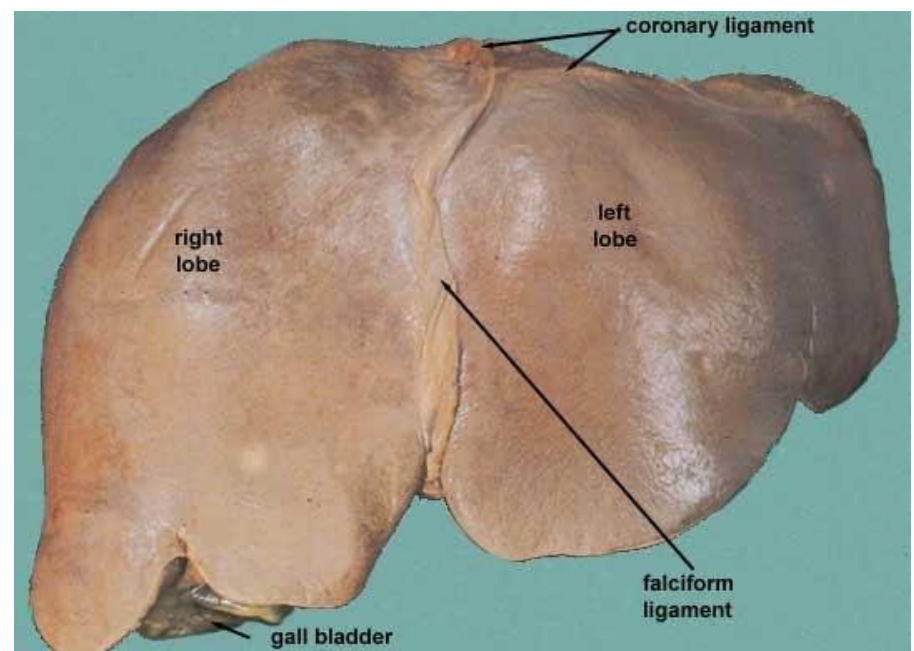
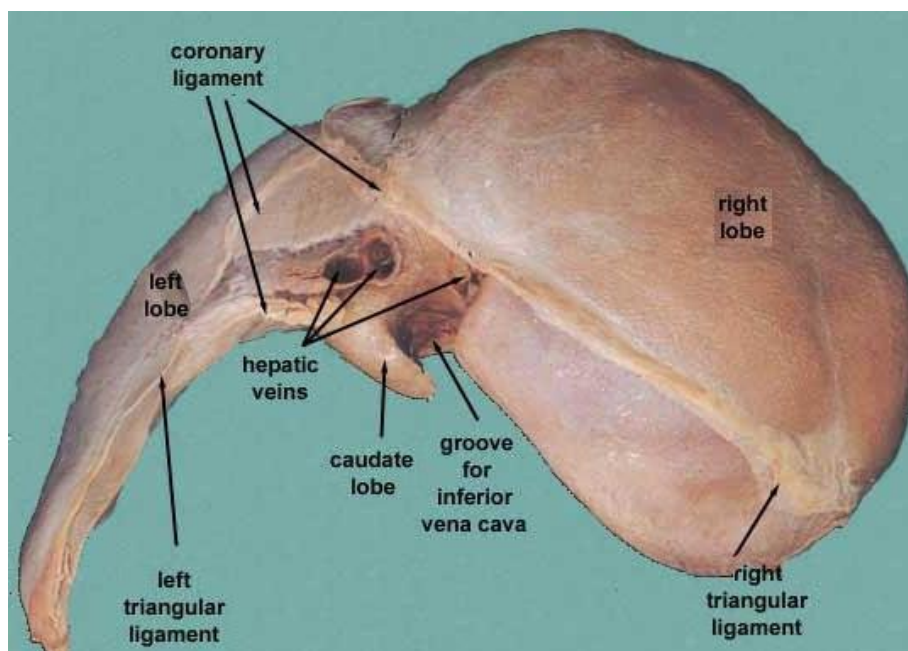


Liver

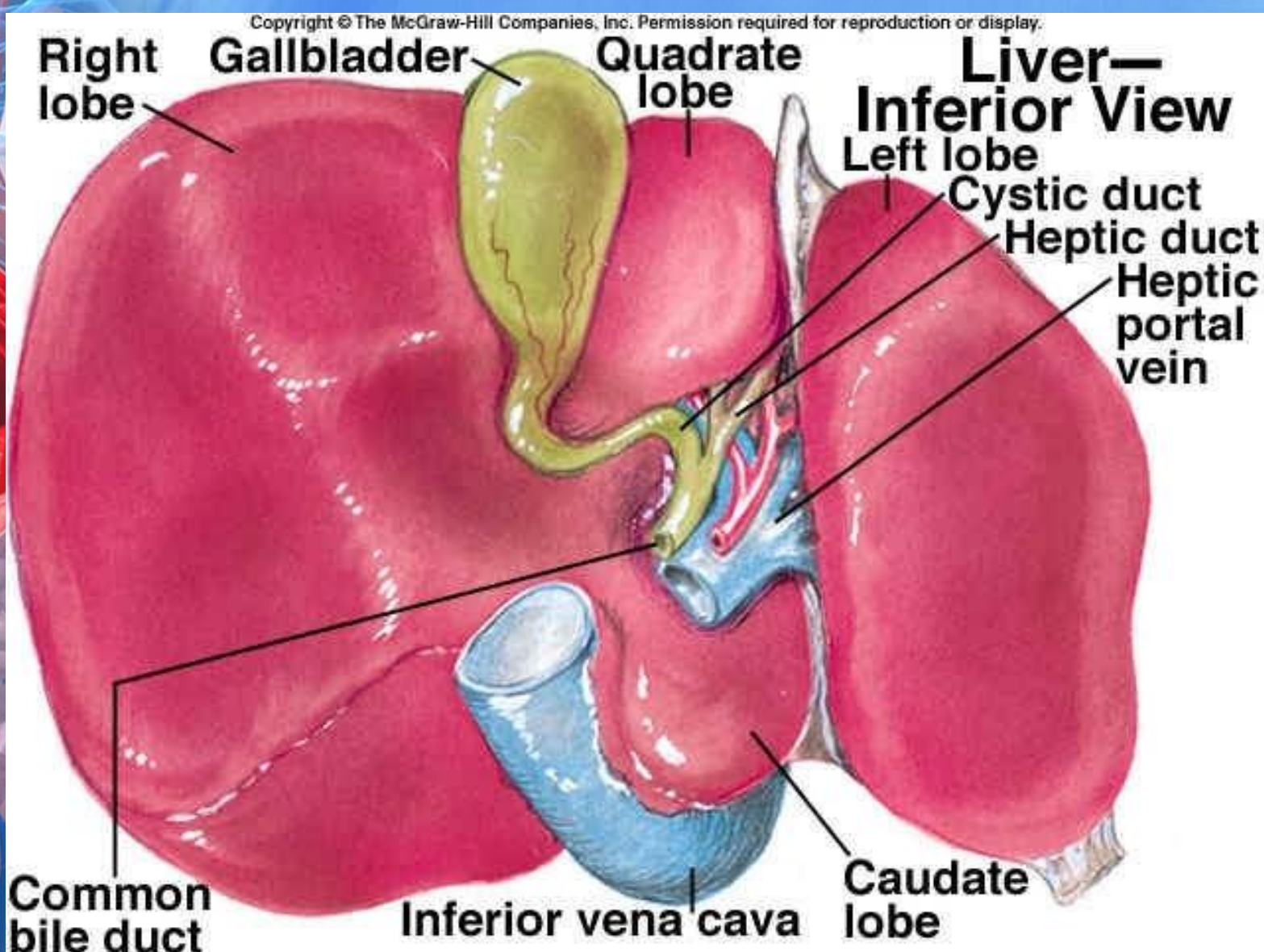


Surfaces of Liver

1. Diaphragmatic surface
2. Visceral surface : structures lie like 'H'



Visceral Surface 'H'

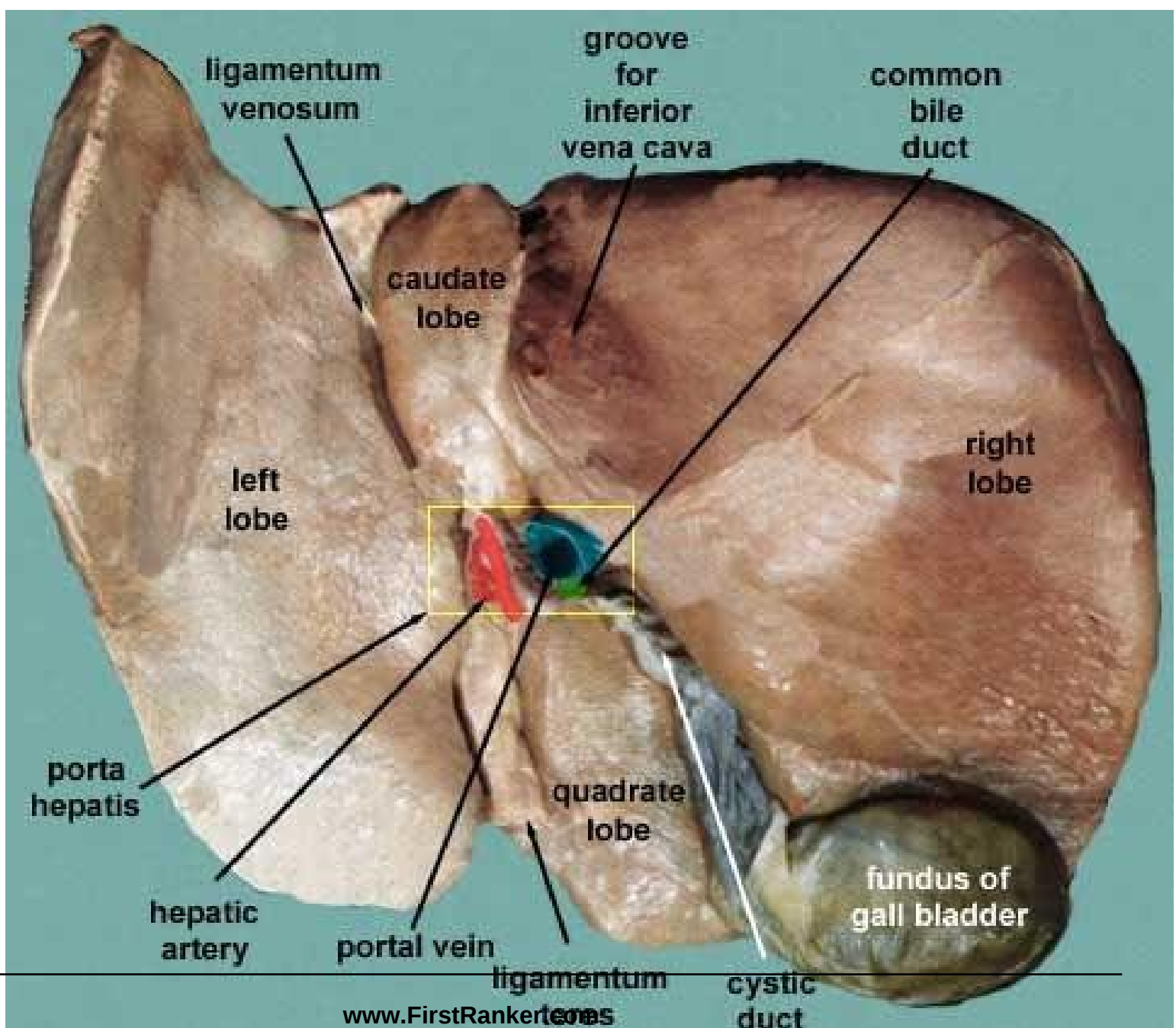


Liver

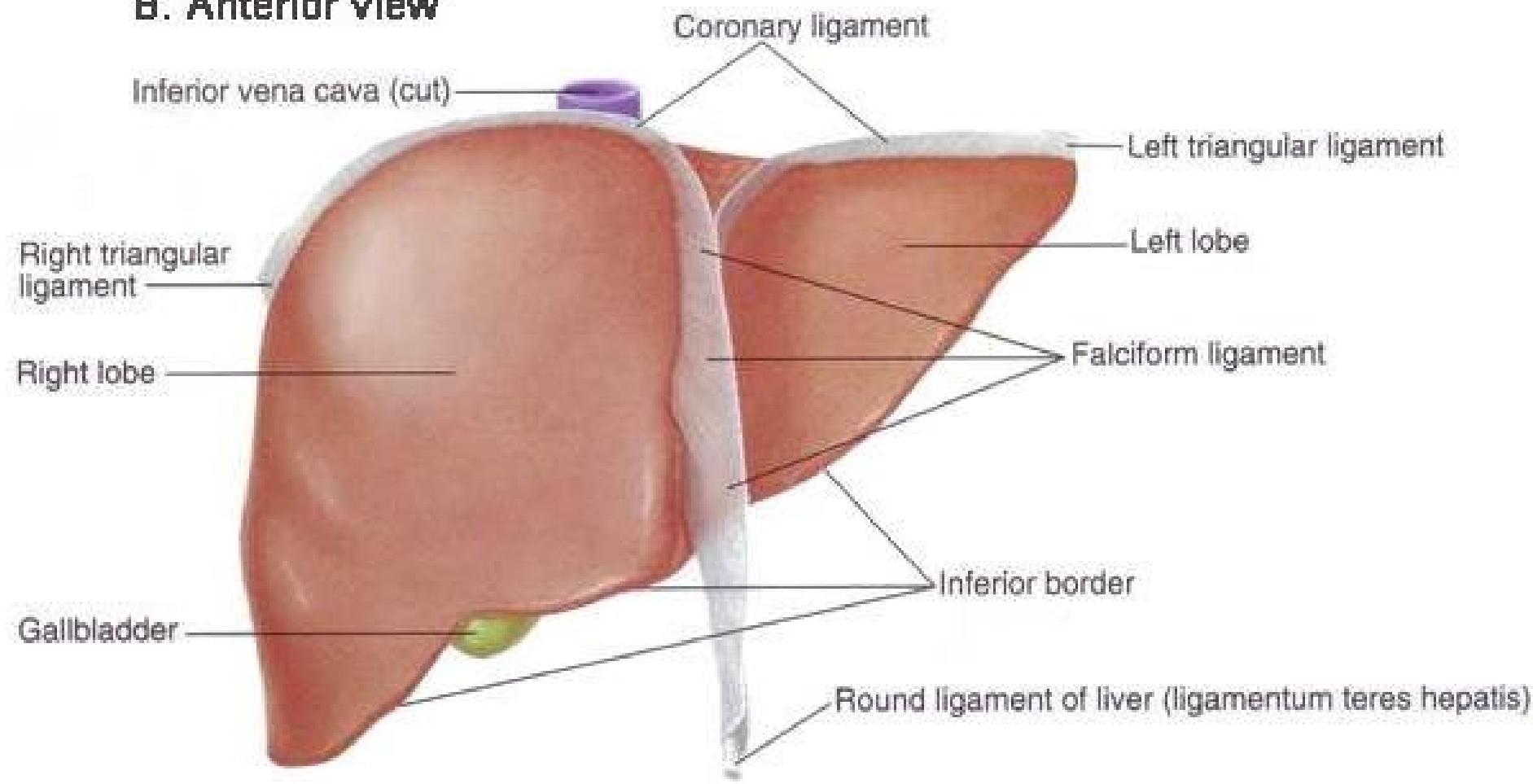
Visceral surface 'H'

1. Cross-bar of H = Porta hepatis
 - Hepatic artery, Portal vein, Bile ducts, Nerves and Lymphatic vss.
2. Lt. inferior of H = Ligamentum teres hepatis or round ligament of liver (Remnant of umbilical v.)
3. Lt. superior of H = Ligamentum venosum (Remnant of ductus venosus)
4. Rt. inferior of H = Gall bladder
5. Rt. superior of H = Inferior vena cava

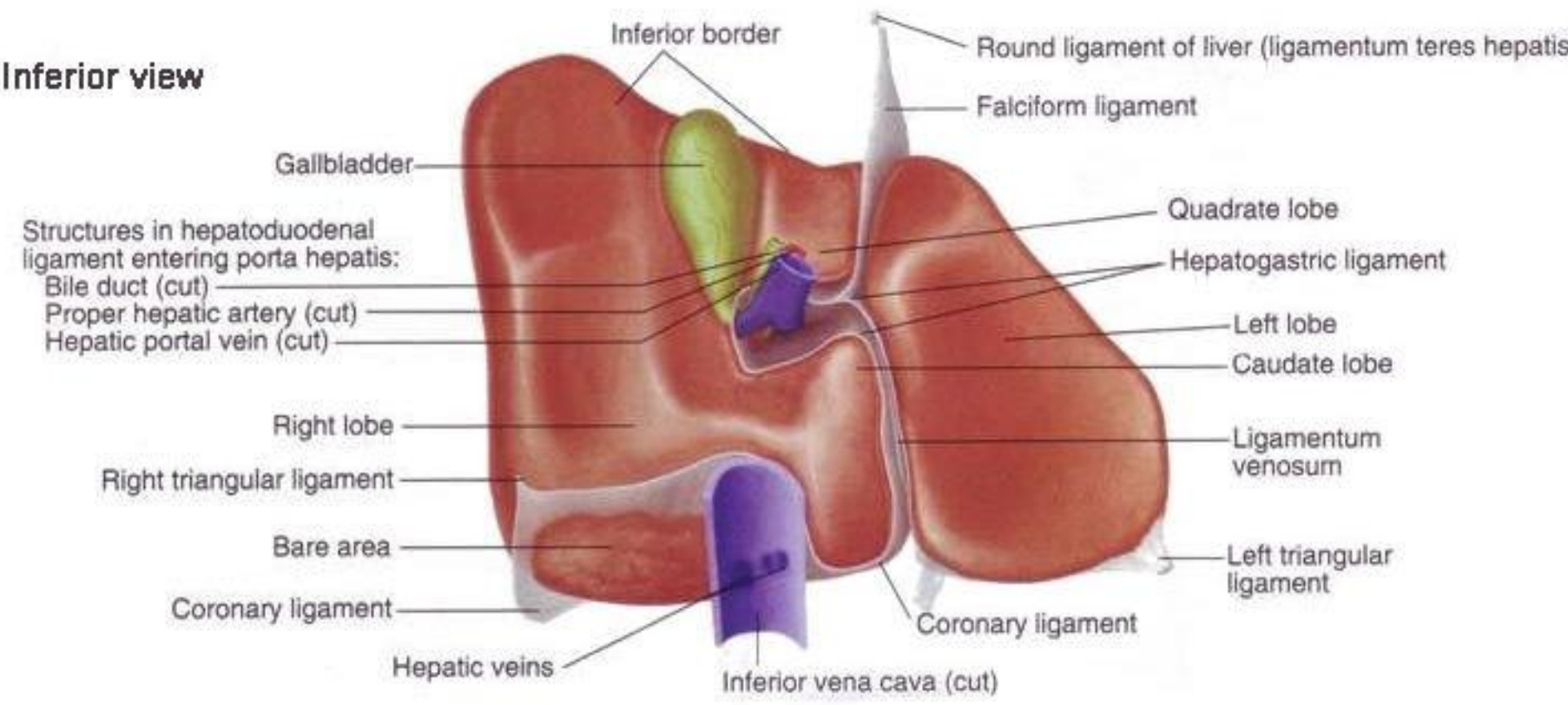
Visceral Surface 'H'



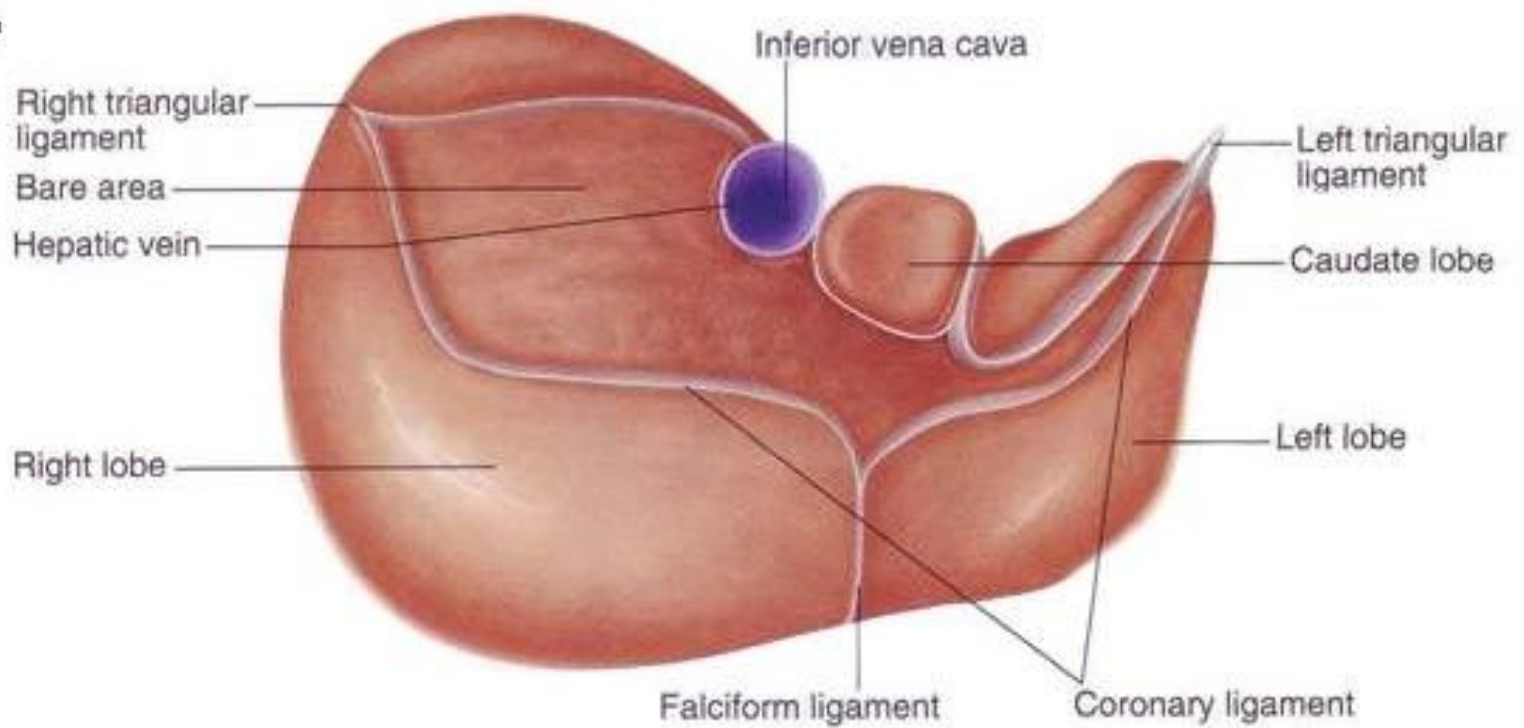
B. Anterior View



C. Inferior view



D. Superior view



Liver

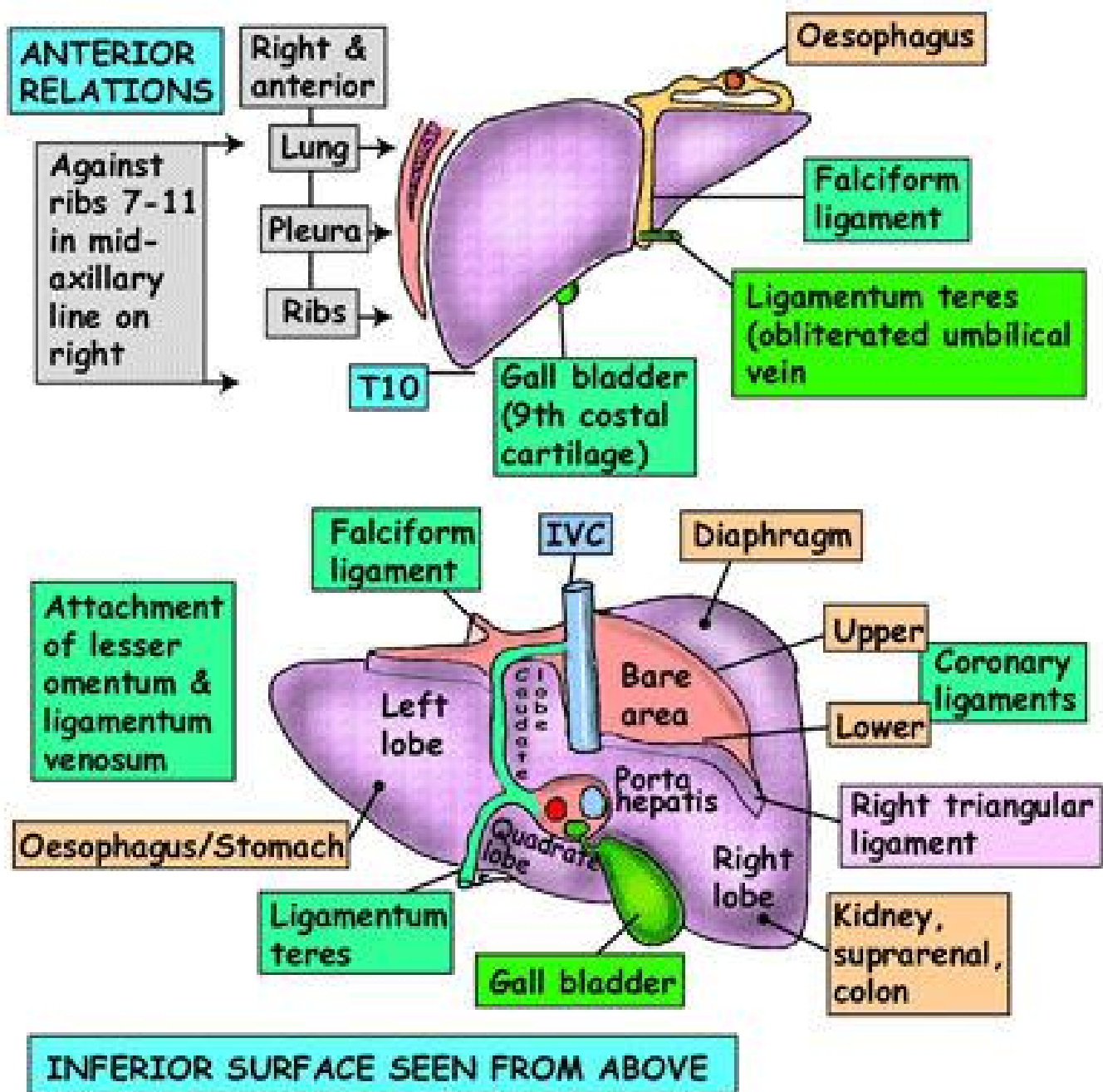
Peritoneal relations

1. Peritoneal ligaments

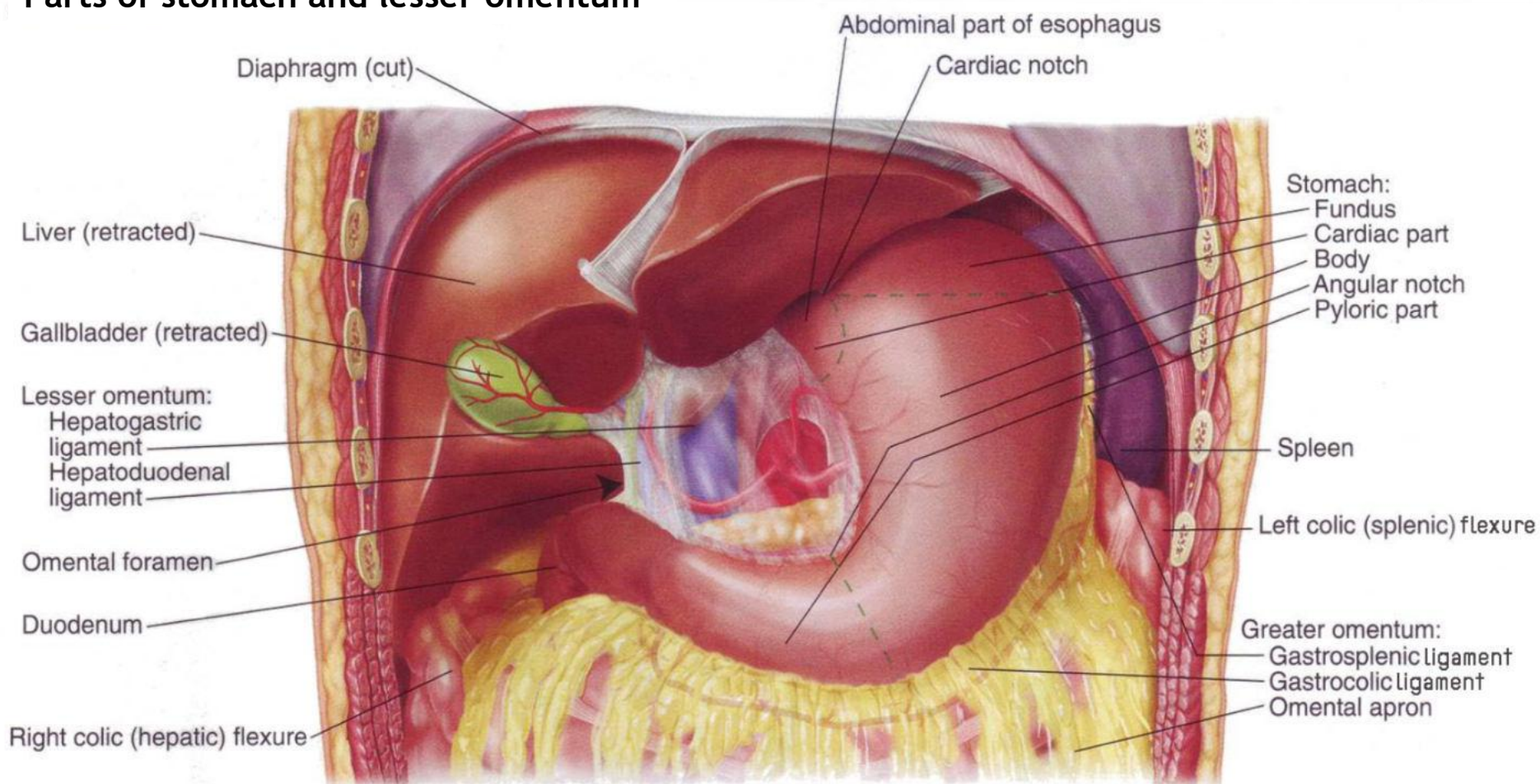
- Lesser omentum
- Falciform ligament
- Coronary ligaments
- Triangular ligaments

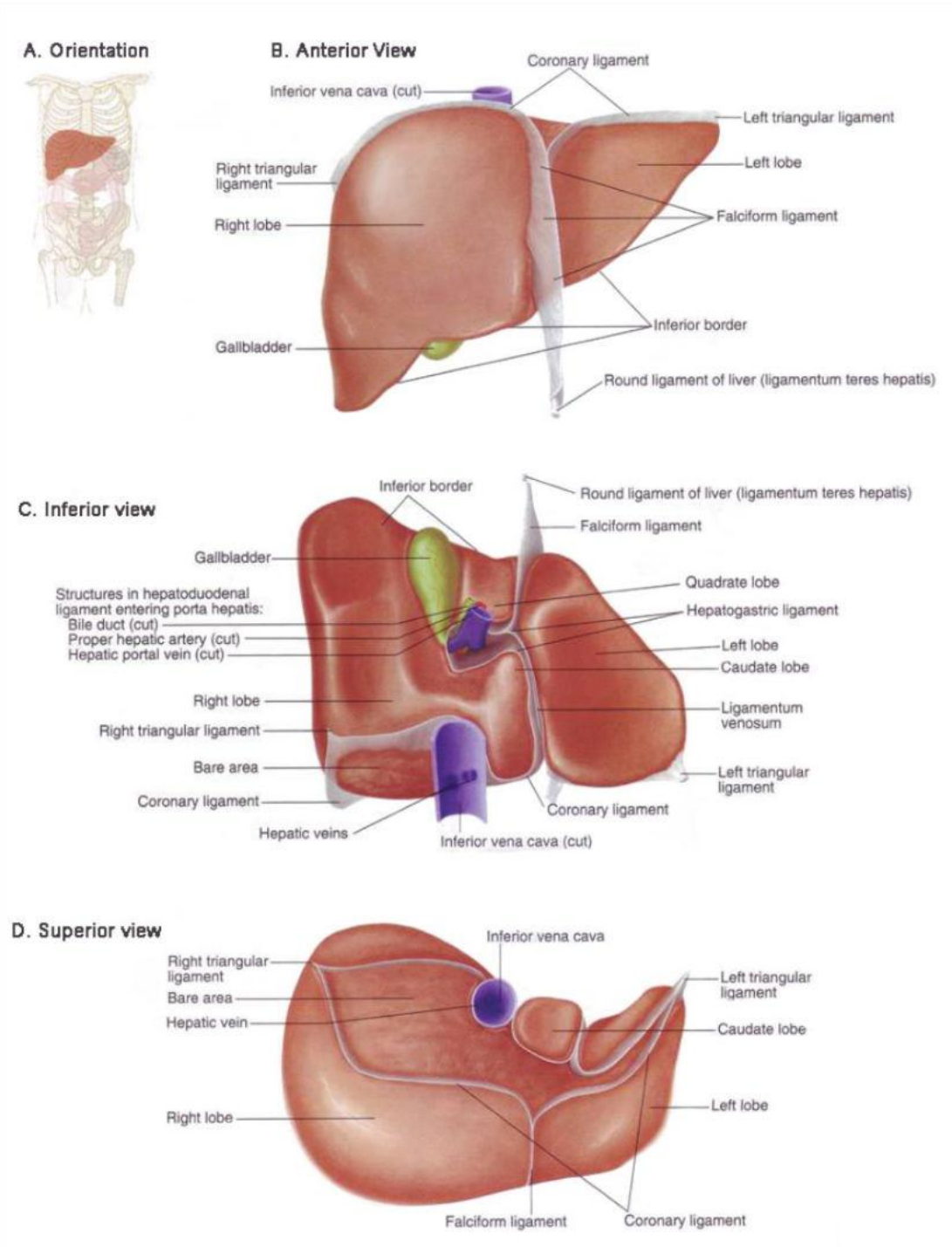
2. Vascular ligaments

- Round ligament of the liver
- Ligamentum venosum



Parts of stomach and lesser omentum



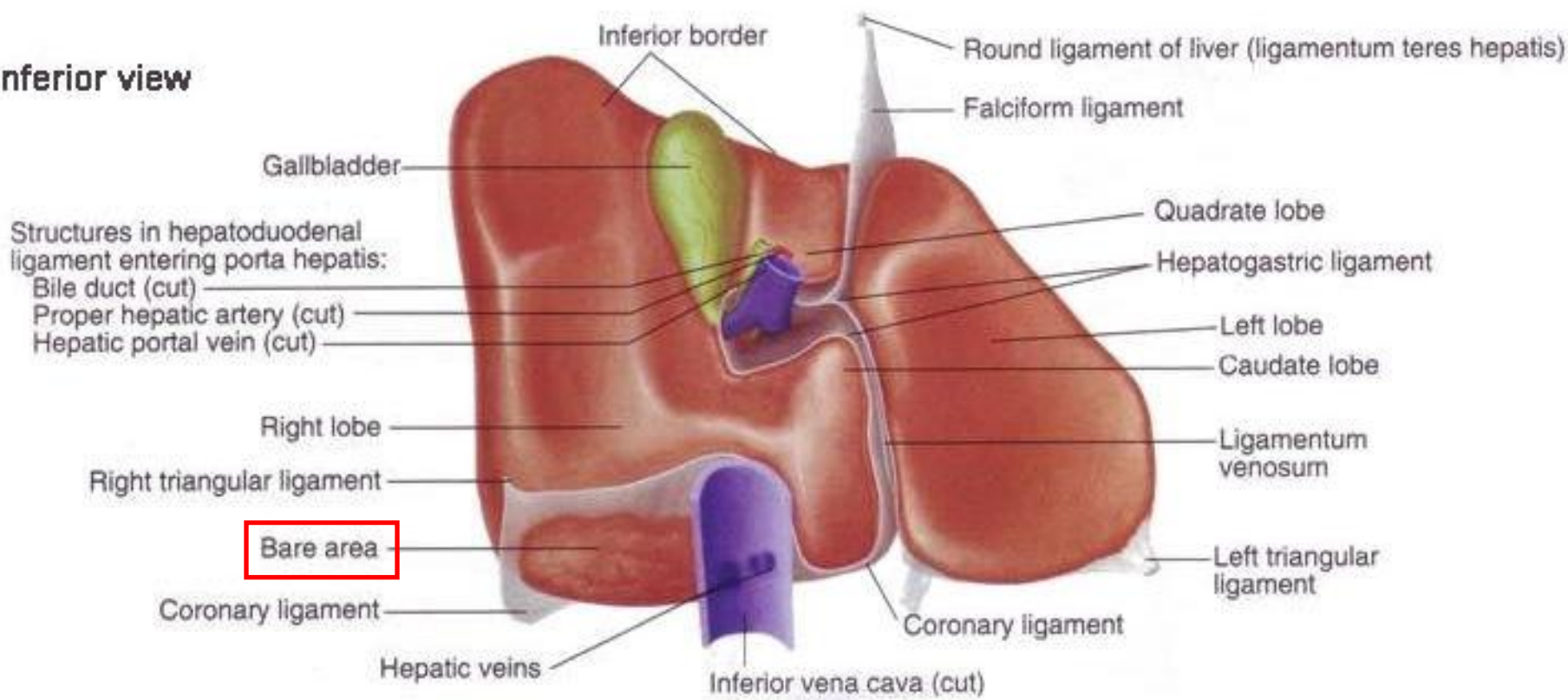


Liver

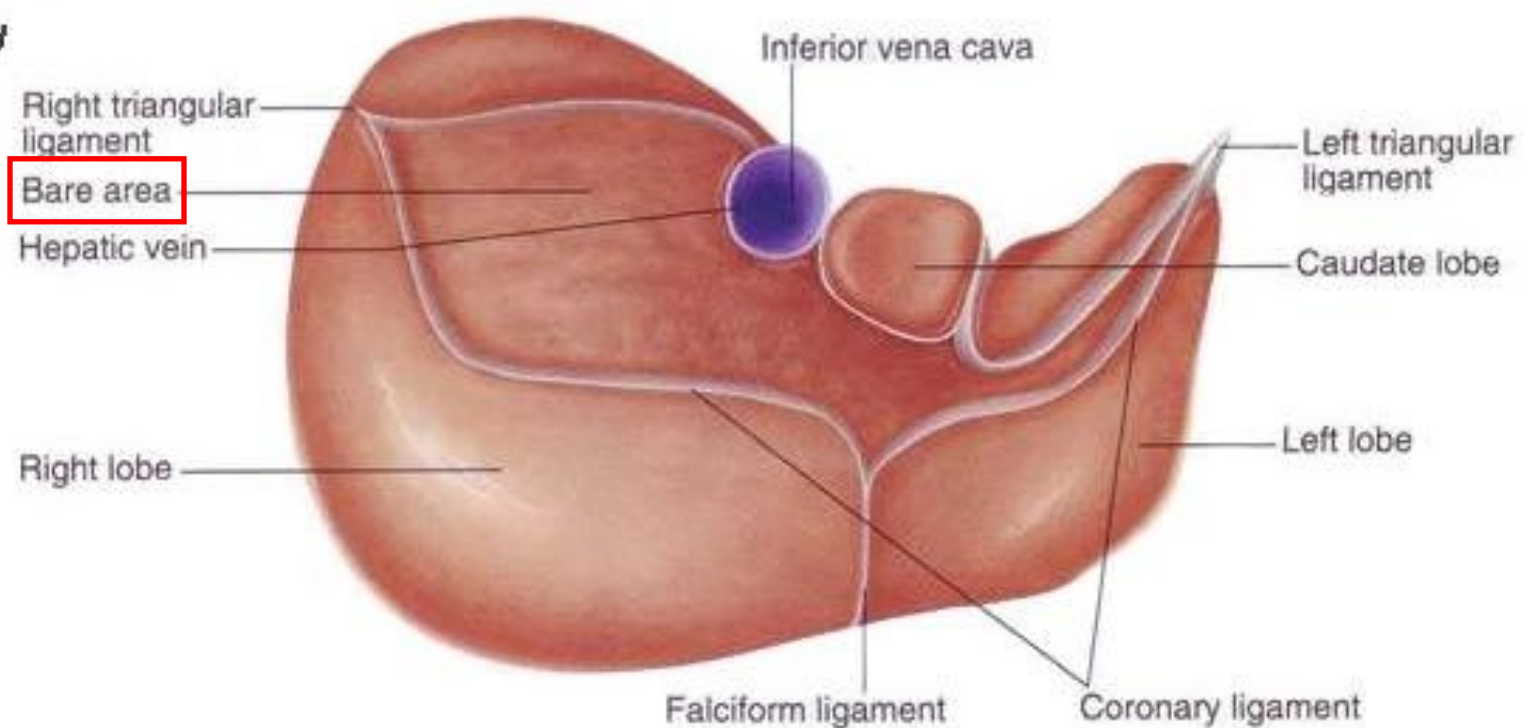
Bare areas of the liver peritoneum

1. b/t Ant. & Post. Coronary ligaments
2. Fossa for gall bladder
3. Porta hepatis
4. Fissure for round ligament
5. Fissure for ligamentum venosum
6. Fossa for IVC

C. Inferior view



D. Superior view



Liver

Lobes of liver

1. *Anatomical lobation*

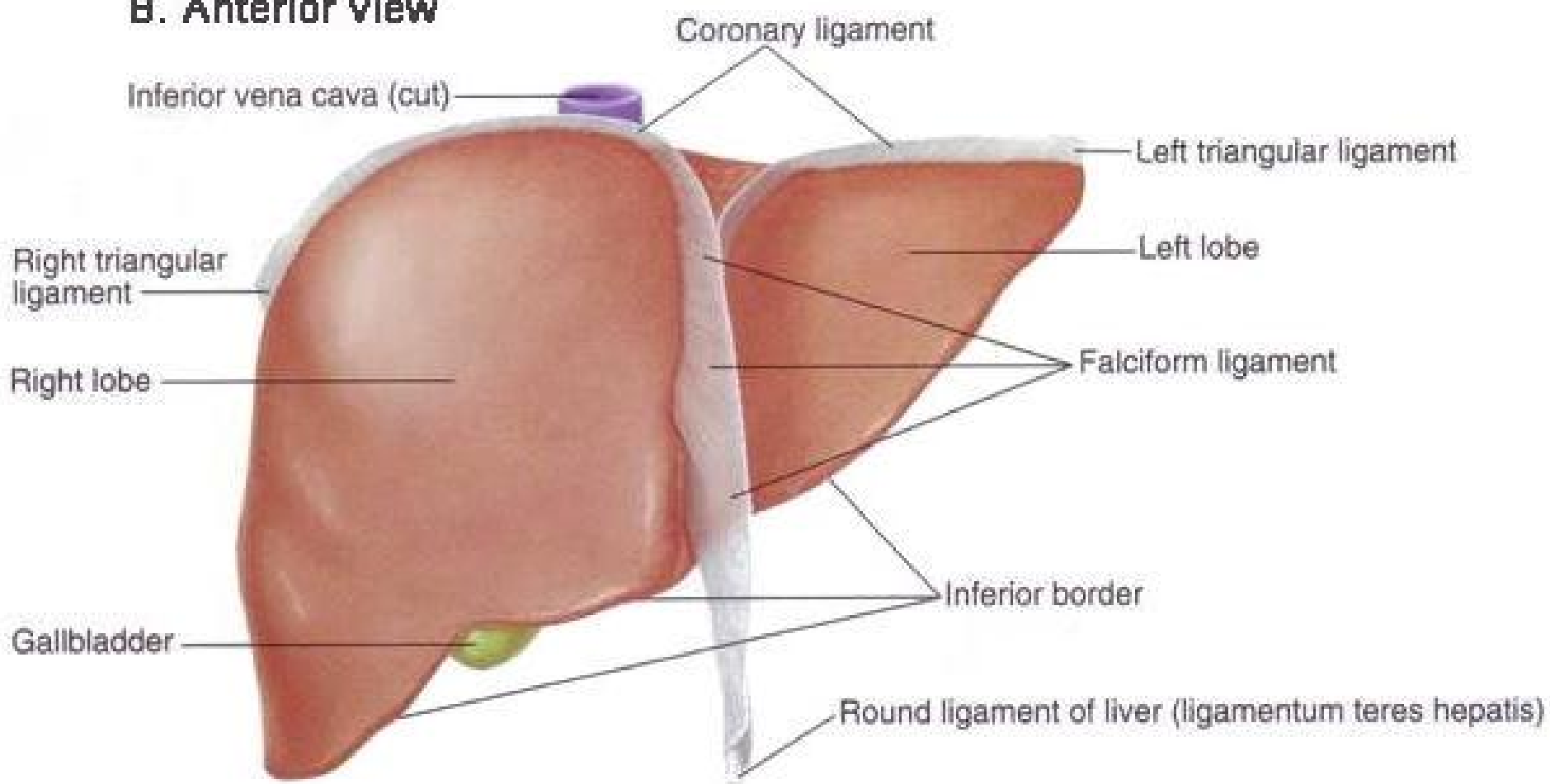
- Right lobe
- Left lobe
- Caudate lobe
- Quadrate lobe

2. *Functional lobation*

- Right lobe
- Left lobe
- By a line passing the gallbladder and IVC

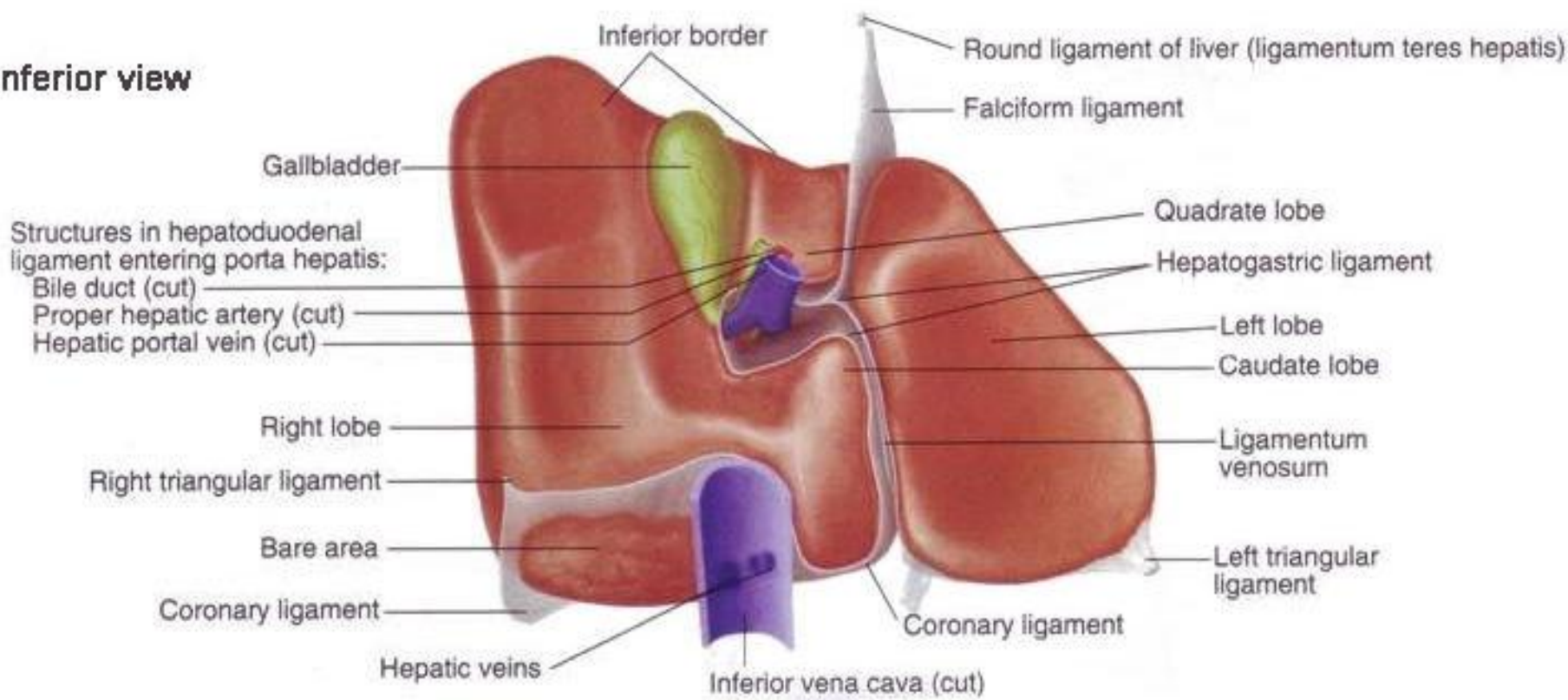
Anatomical lobes

B. Anterior View



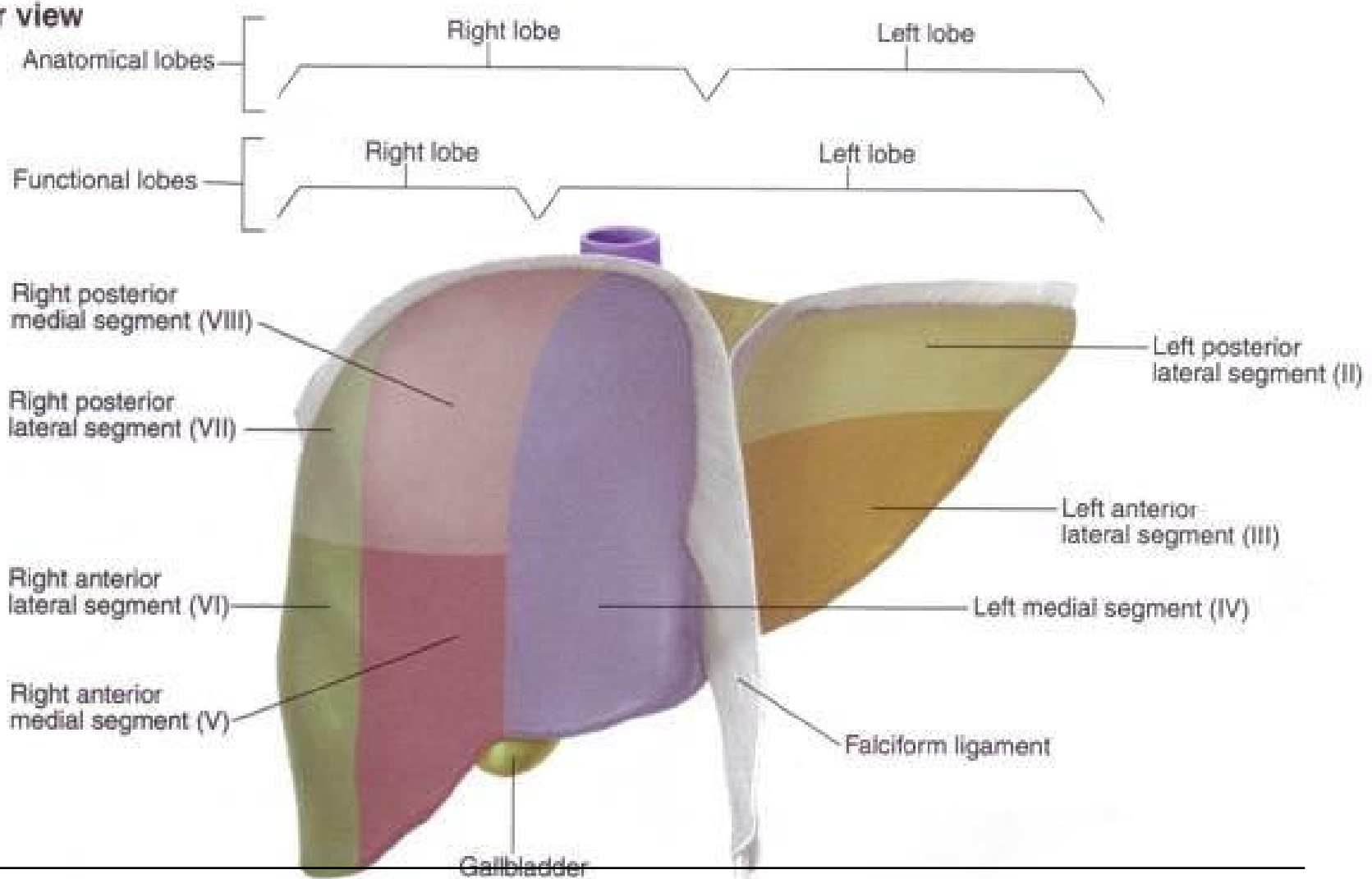
Anatomical lobes

C. Inferior view



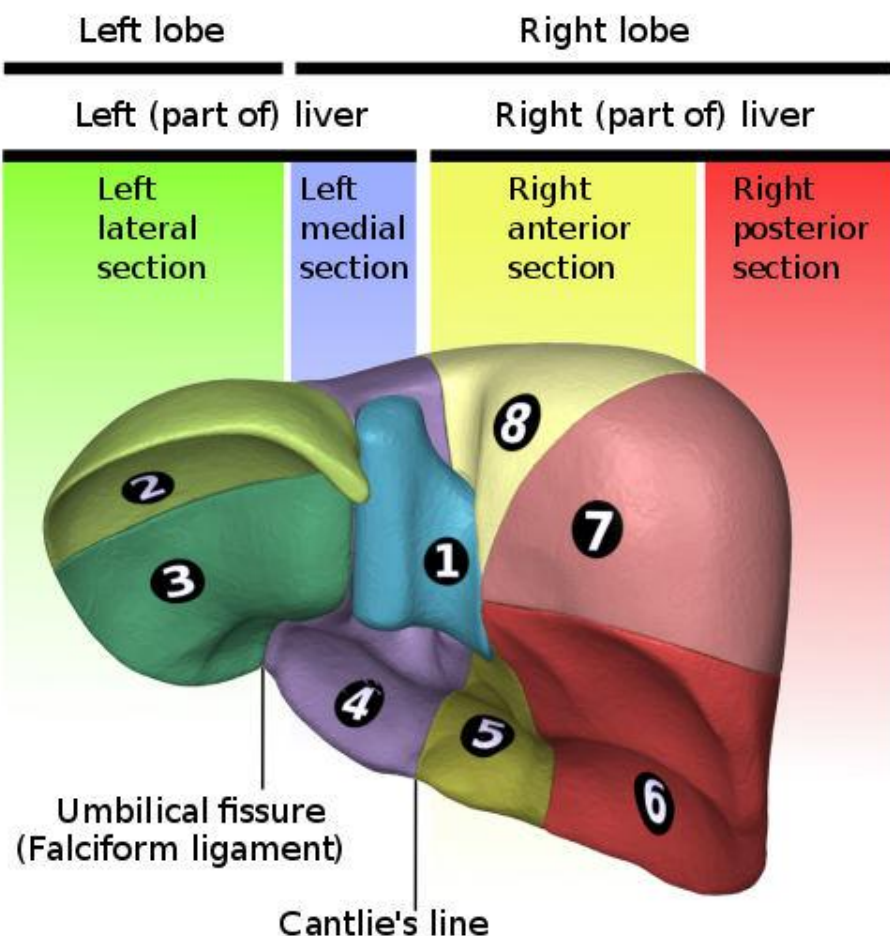
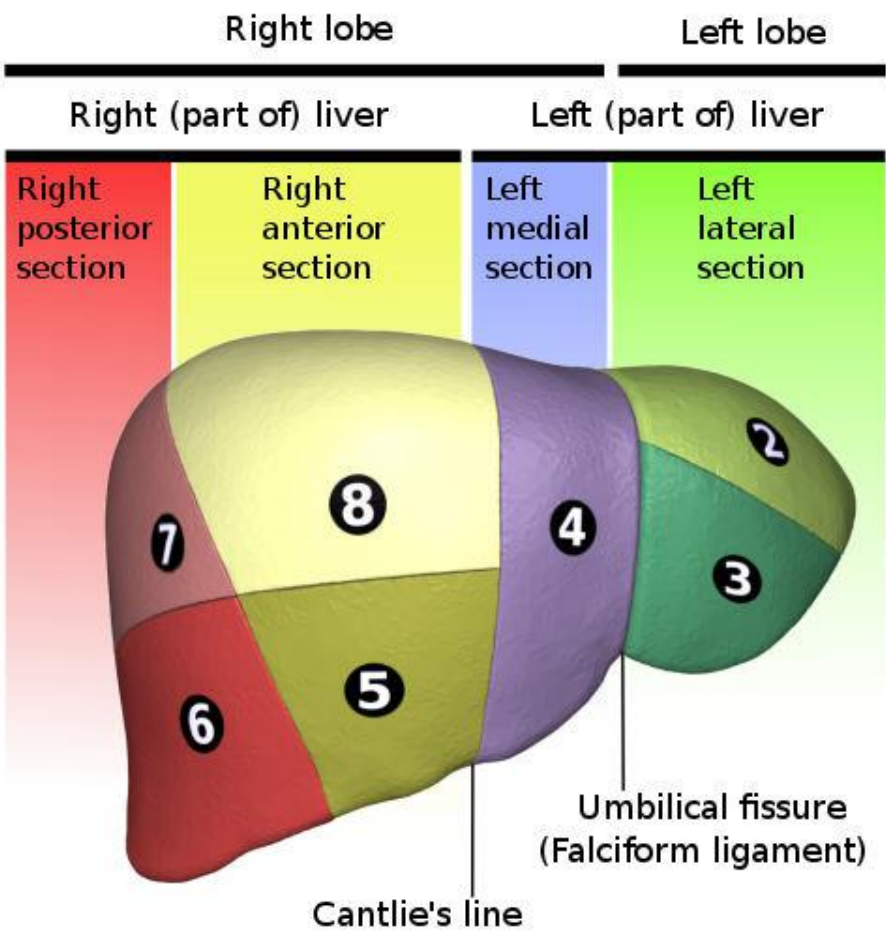
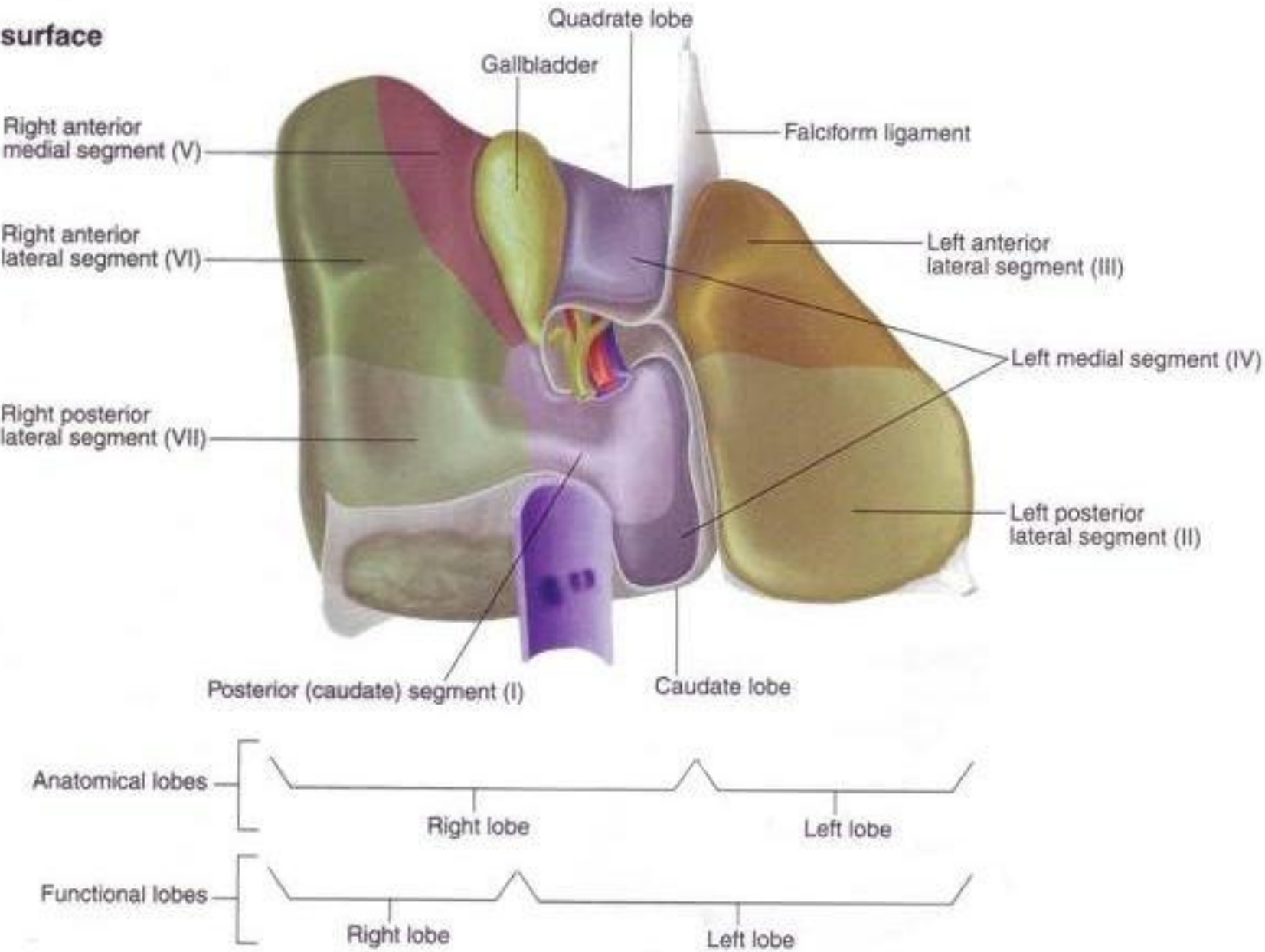
Functional lobes

A. Anterior view



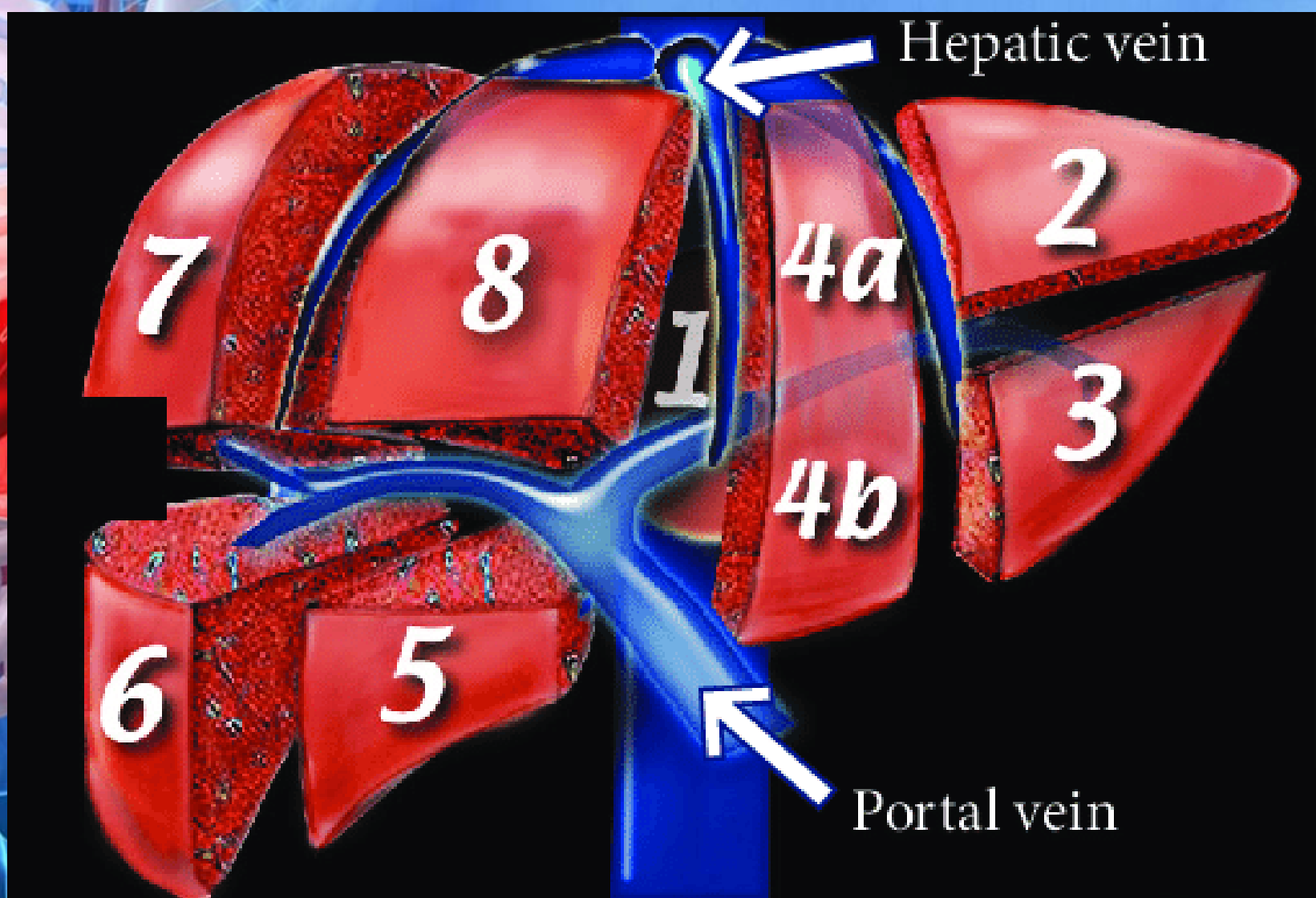
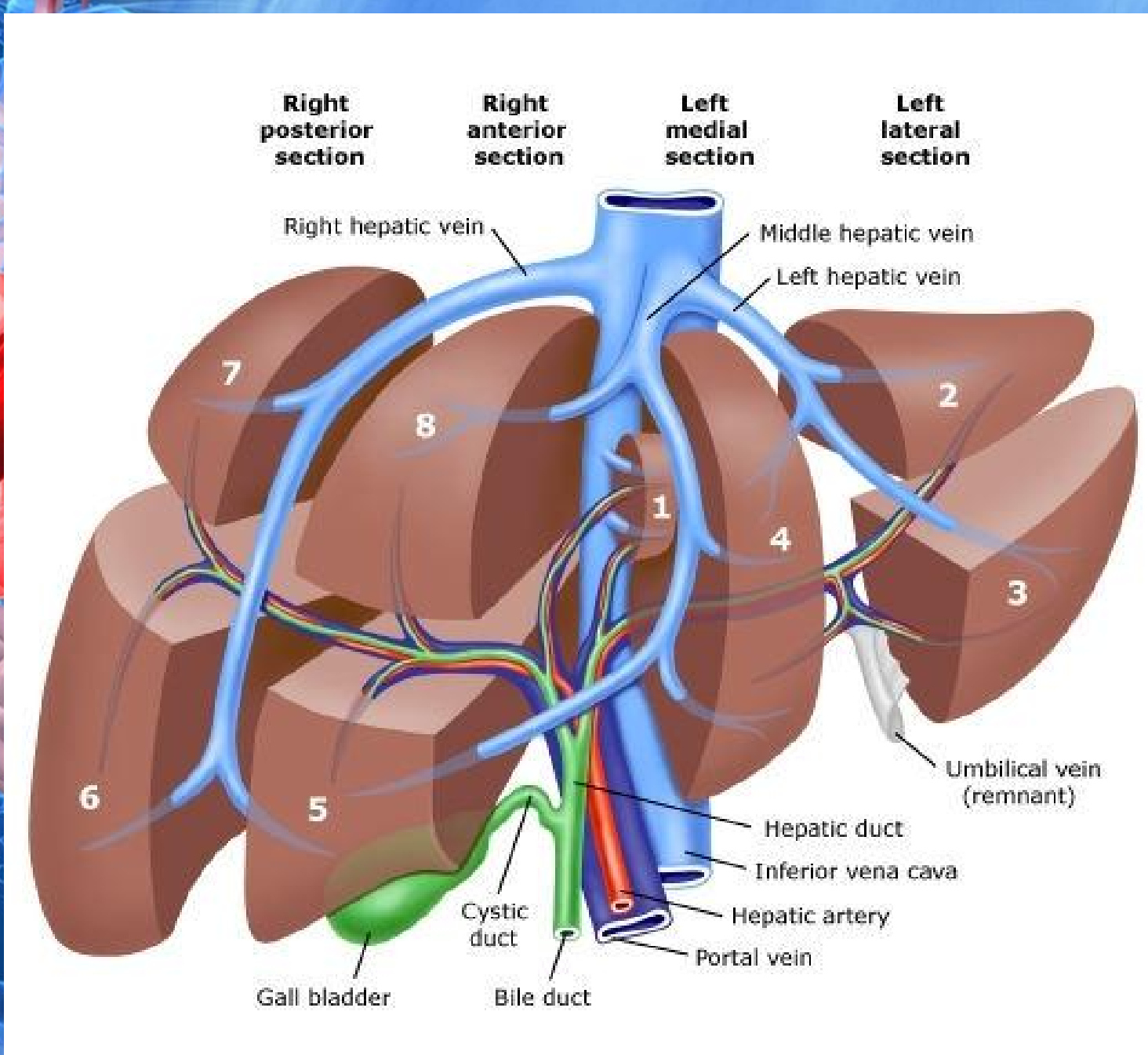
Functional lobes

B. Visceral surface



Anterior view

Posterior view

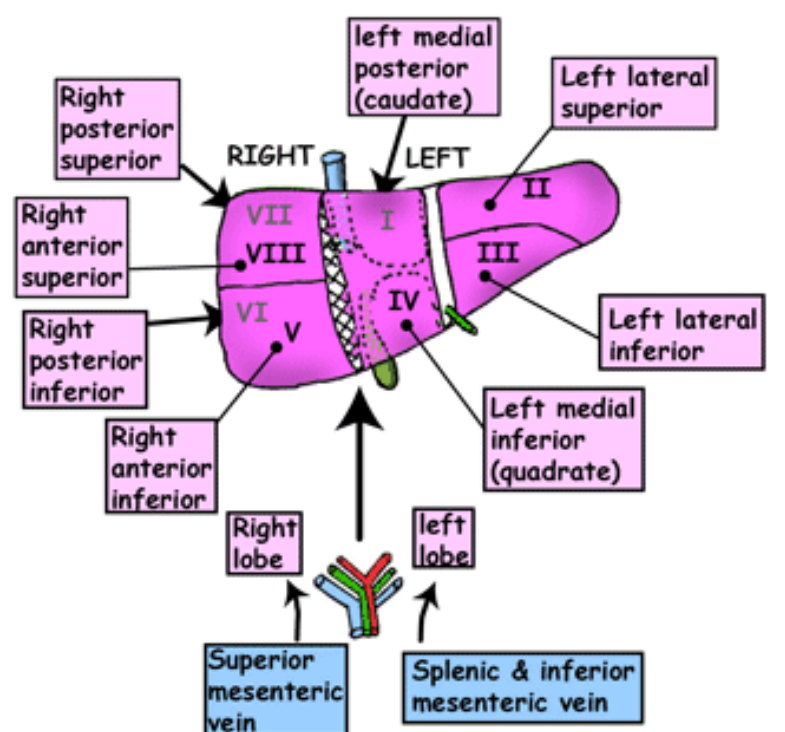


Liver

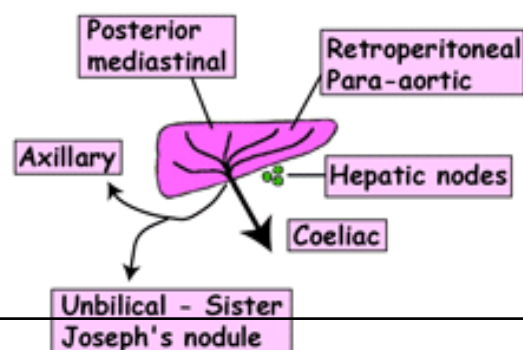
Blood supply of liver

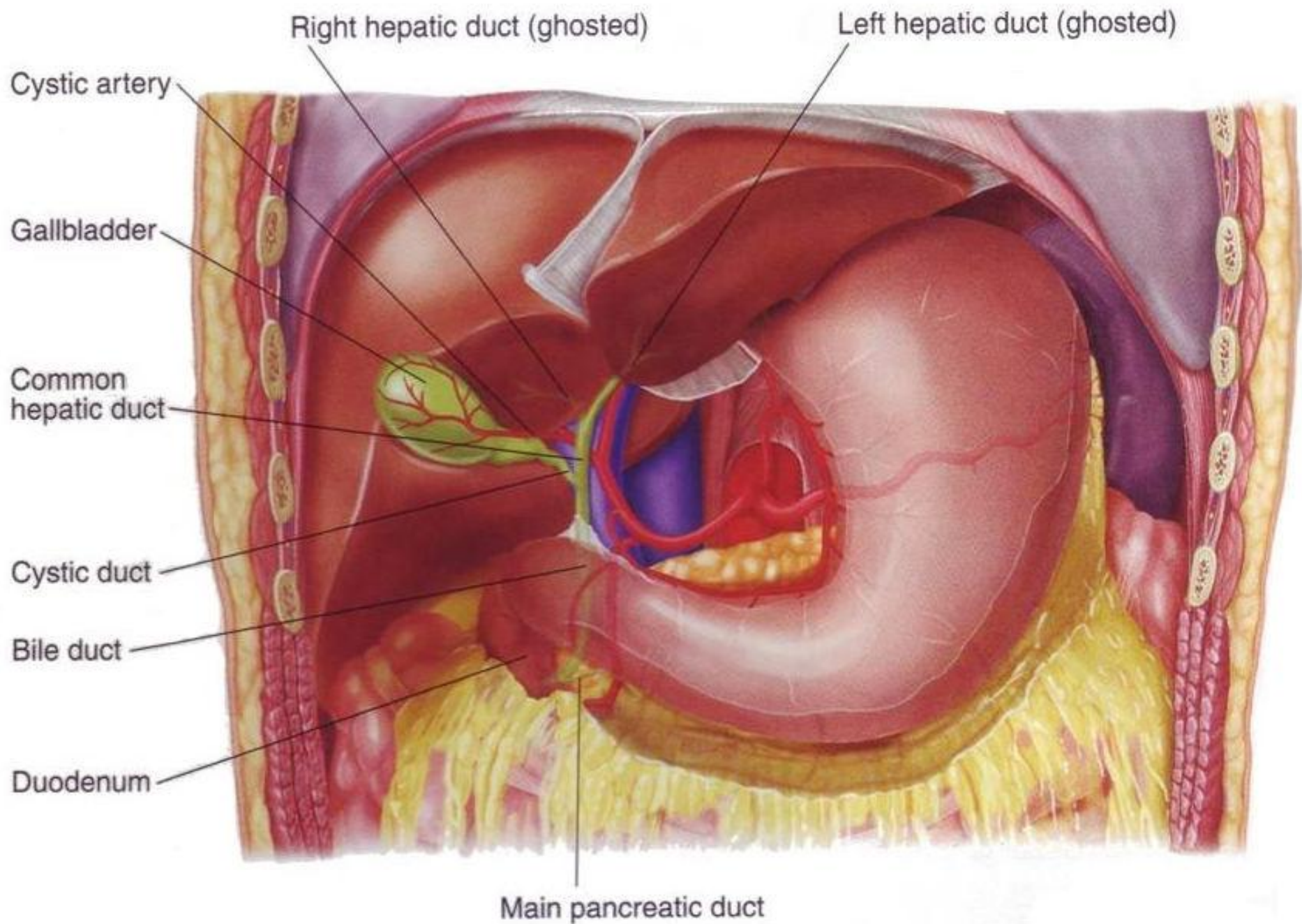
1. Rt. & Lt. hepatic arteries carry oxygenated blood **(25%)**
2. Portal vein carries venous blood **(75%)** rich in nutrients
3. Hepatic veins drain venous blood to IVC

LIVER - PORTOBILIARY SEGMENTATION

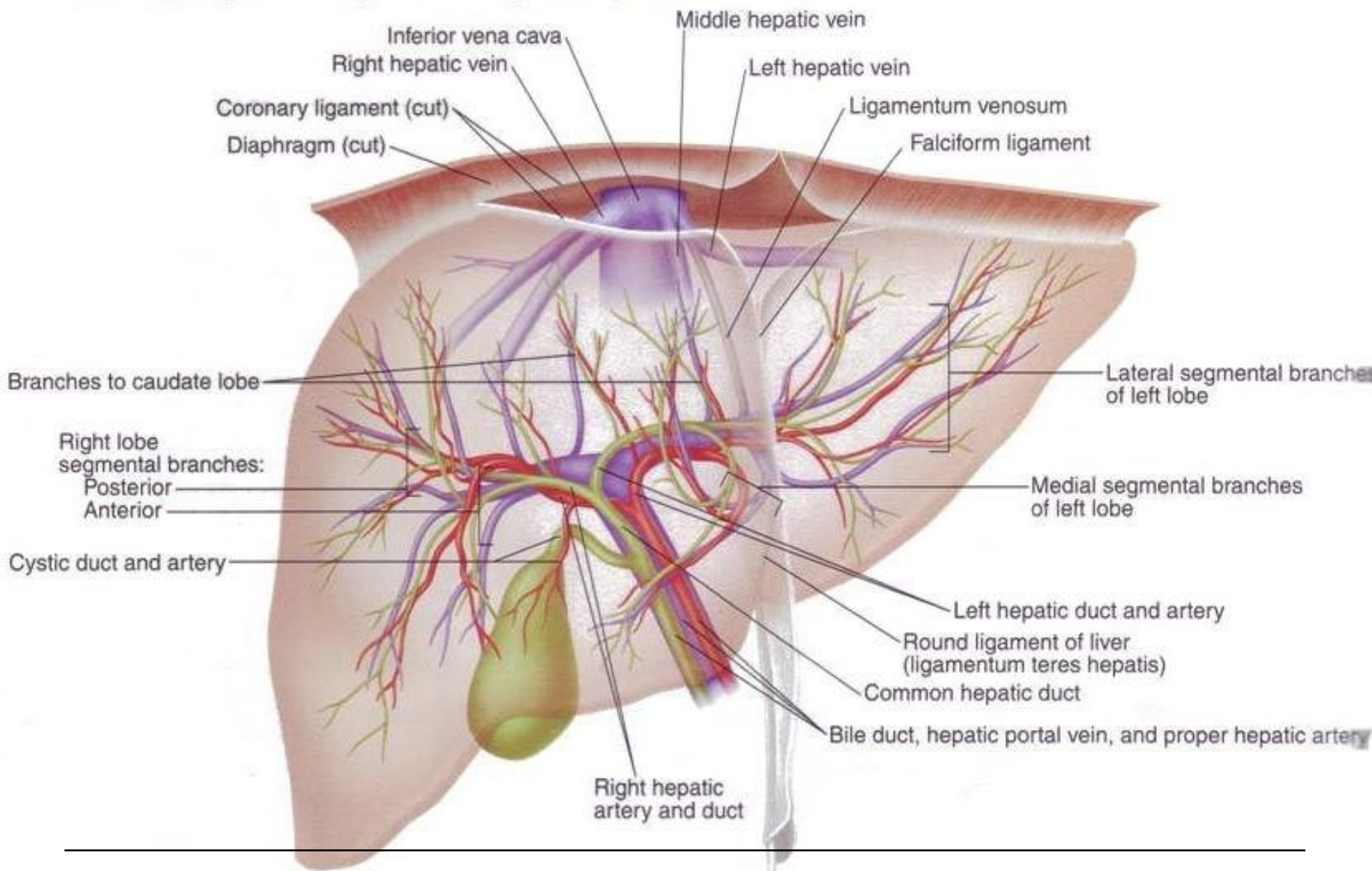


LYMPHATIC DRAINAGE OF LIVER

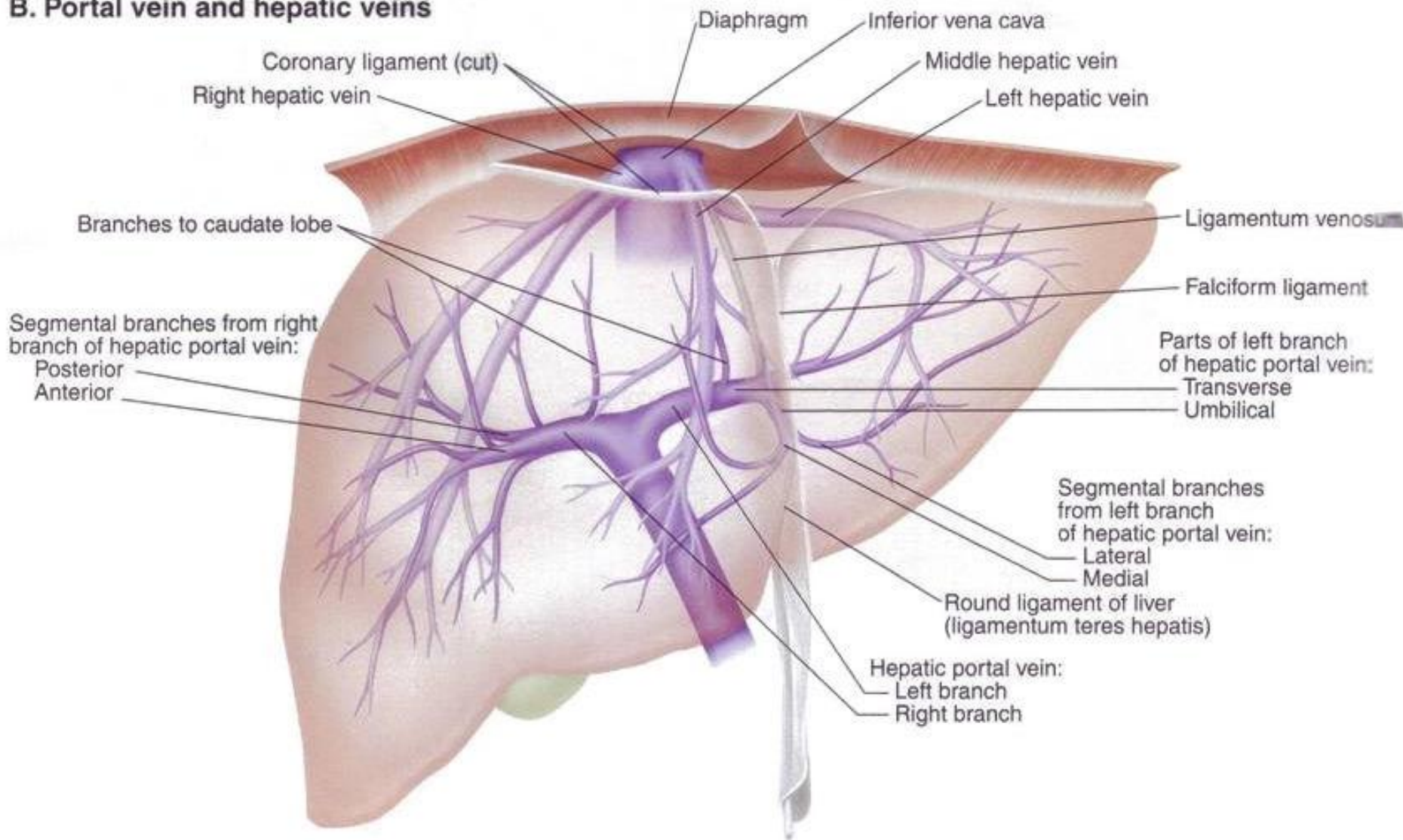




A. Portal vein, hepatic artery, and biliary duct system

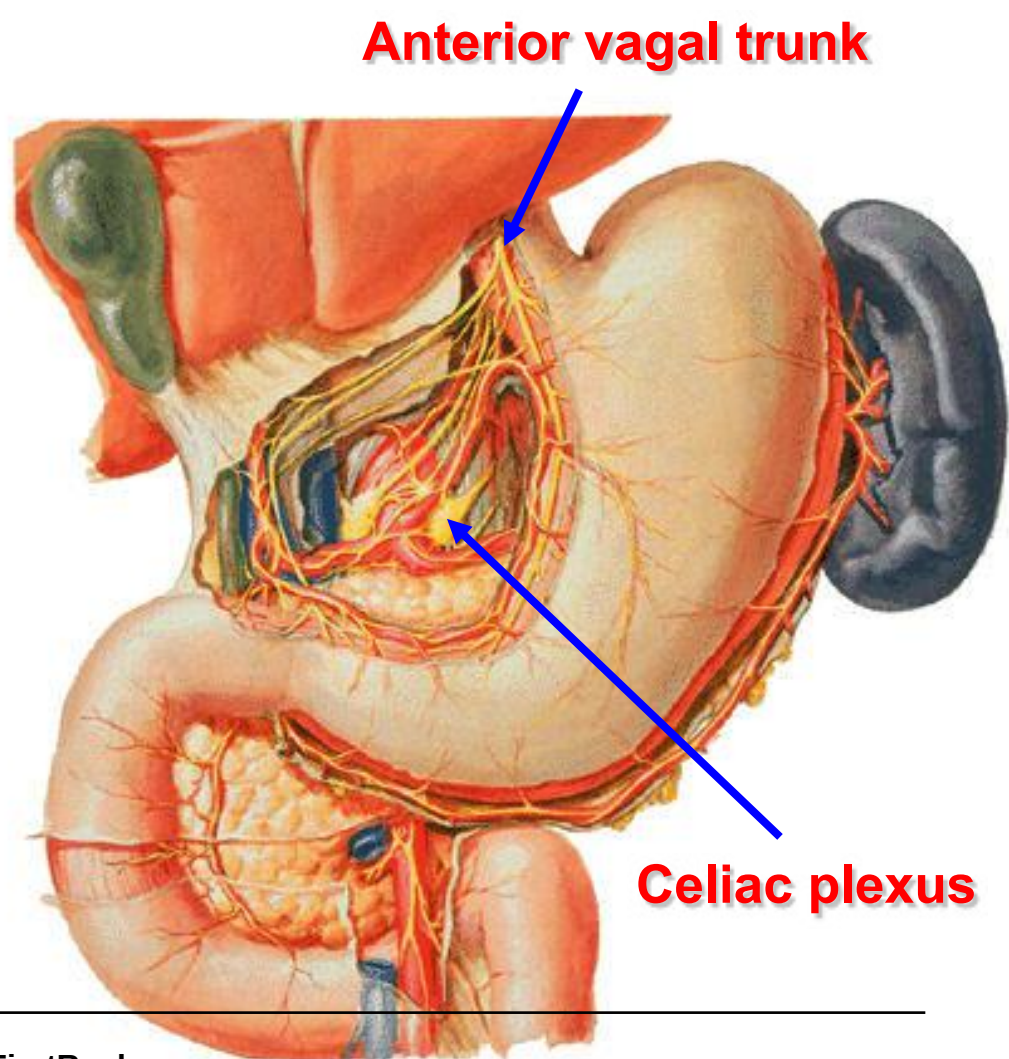


B. Portal vein and hepatic veins



Nerve

- Hepatic plexus contains symp. + parasympath. Or vagal fibers
- Nerve also reach liver via various peritoneal ligaments.



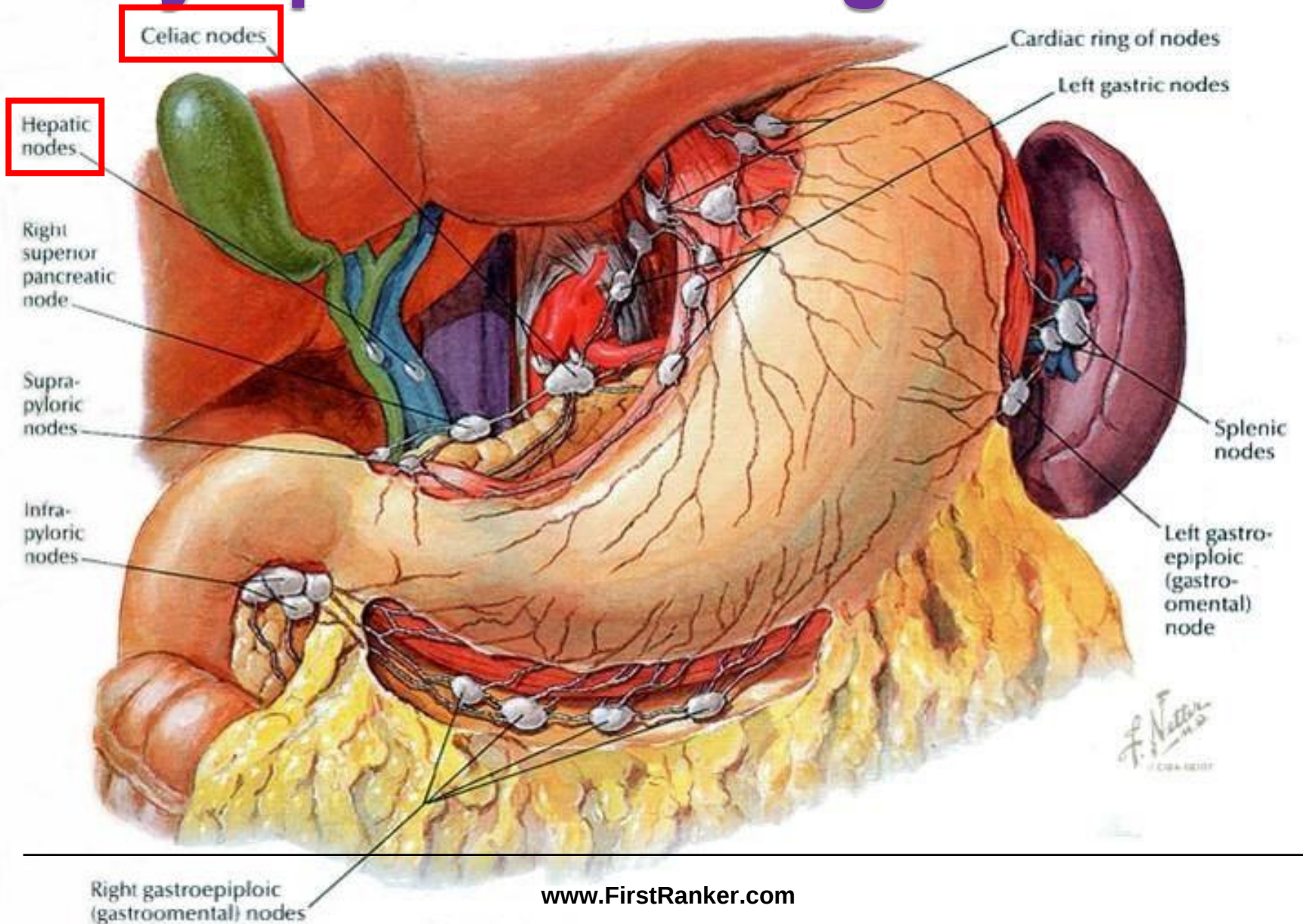
Liver

Lymphatic drainage of liver

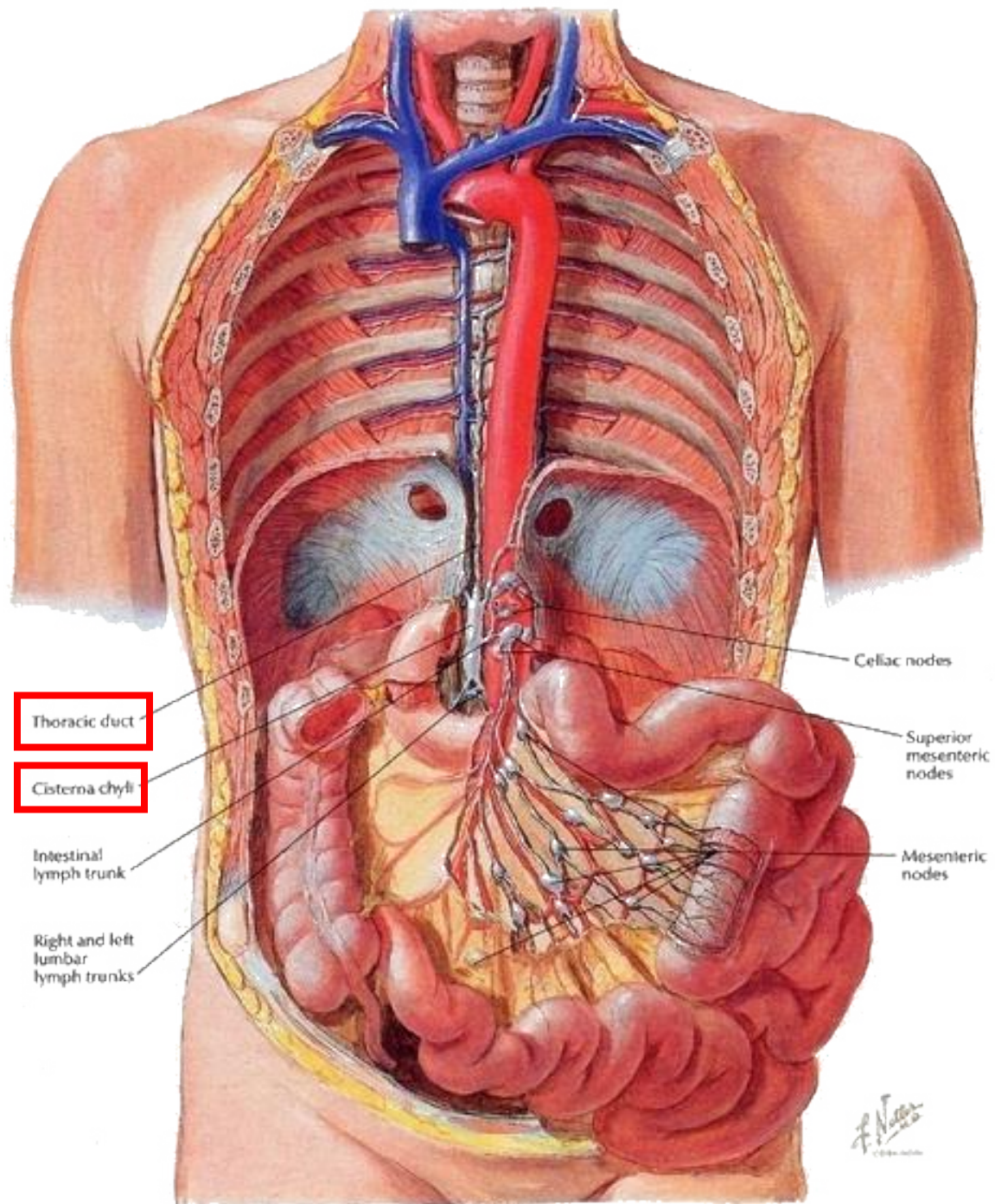
Liver is a major lymph-producing organ
(1/4 - 1/2 of lymph → Thoracic duct)

- *Diaphragmatic surface of liver* drains to Phrenic nodes
- *Visceral surface & deep lymphatics along portal triads* drains to Porta Hepatis → Hepatic nodes → Coeliac nodes → Cisterna chyli → Thoracic duct

Lymphatic drainage of liver



Lymphatic drainage of GI tract



Arterial Supply-

Hepatic artery

Portal vein

Rt& Lt. Branches -> segmental vessels -> Interlobular – Hepatic sinusoids. Mixes

Venous Drainage- Hepatic sinusoids- interlobular + sublobular v. + Hepatic v. -> I.V.C.

Nerve Supply- Hepatic plexus contains symp. + parasympath. Or vagal fibers
Nerve also reach liver via various peritoneal ligaments.

Gallbladder & Biliary tracts

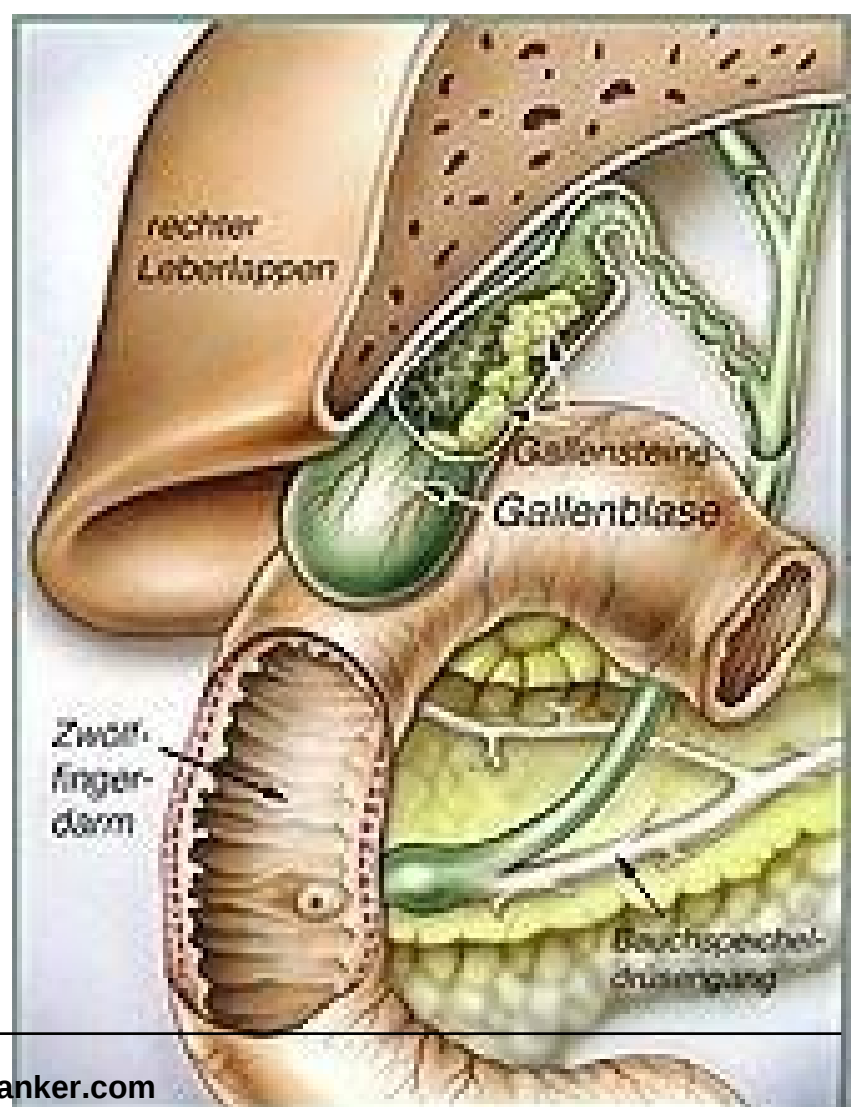


Gallbladder & Biliary tracts

Biliary system consists of

1. **Gall bladder**
2. **Biliary tracts**

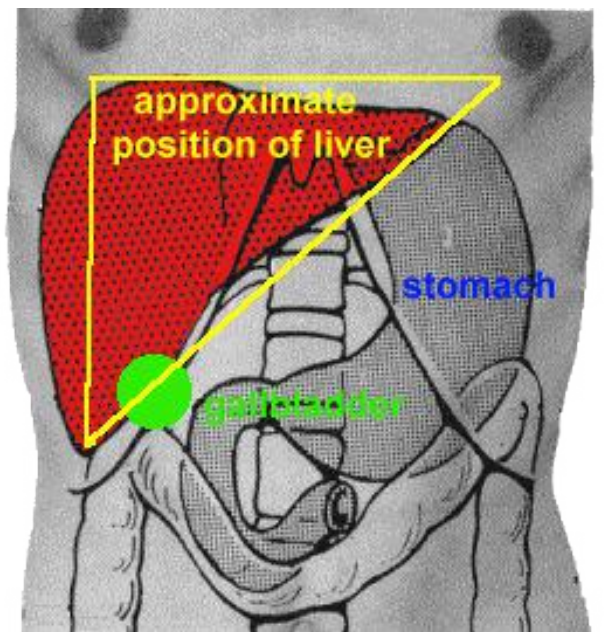
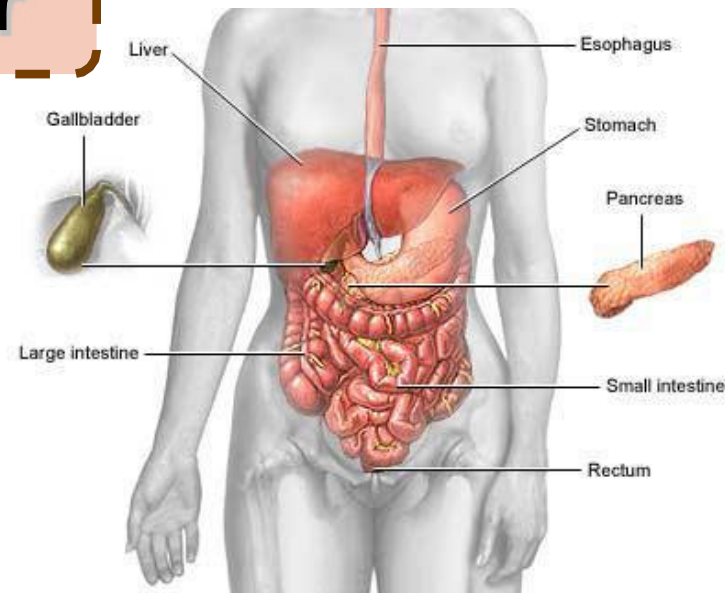
Cystic duct, hepatic ducts, common hepatic duct and common bile duct



Gallbladder

- Length 7-10 cm.
- Capacity 30-50 ml
- b/t Rt. lobe & Quadrate lobe of liver
- Surface projection

**Fundus of gallbladder =
Murphy's point**

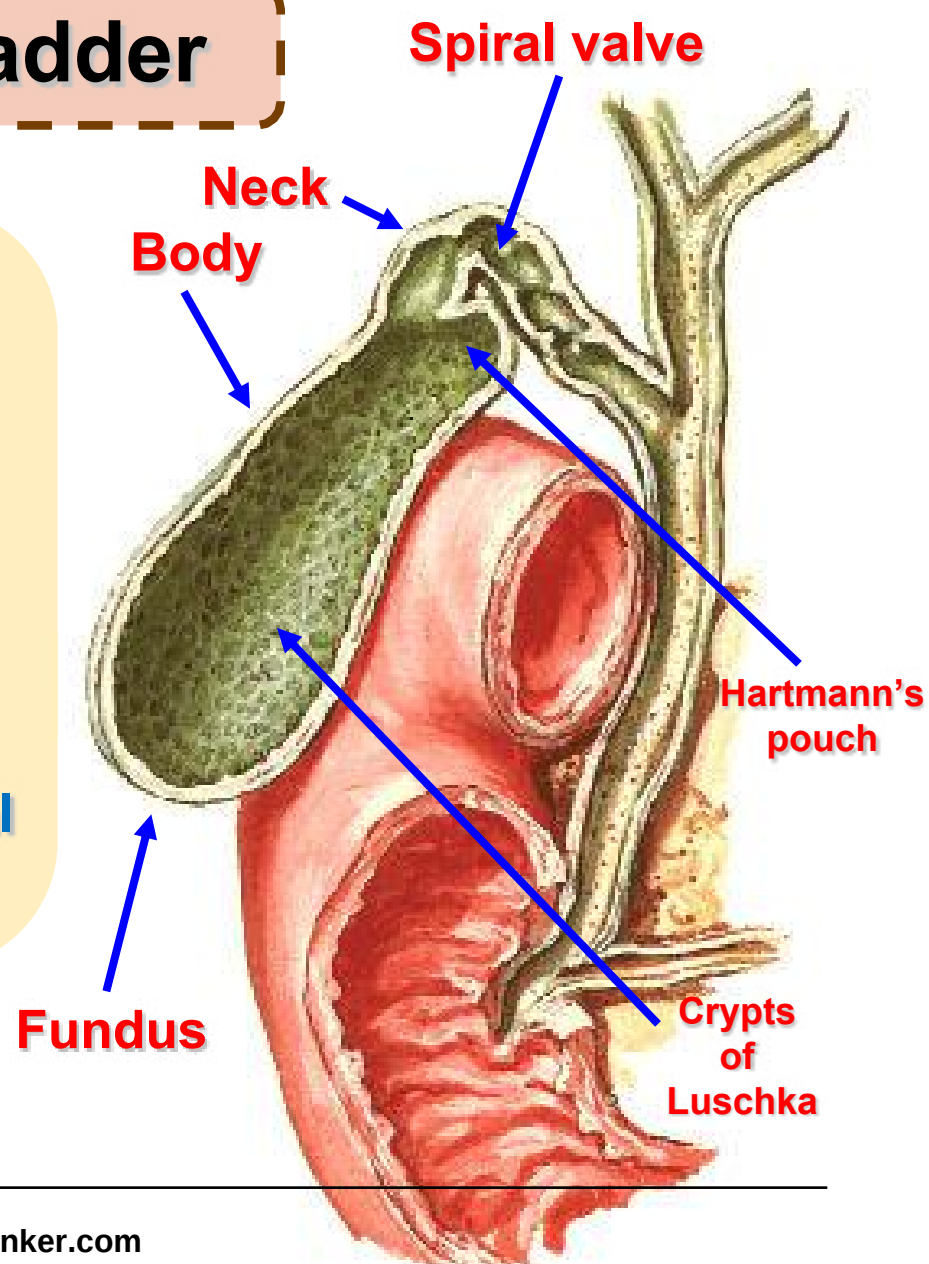


Gallbladder

Gallbladder has 4 portions

1. Fundus
2. Body
3. Neck → Infundibulum :
Hartmann's pouch

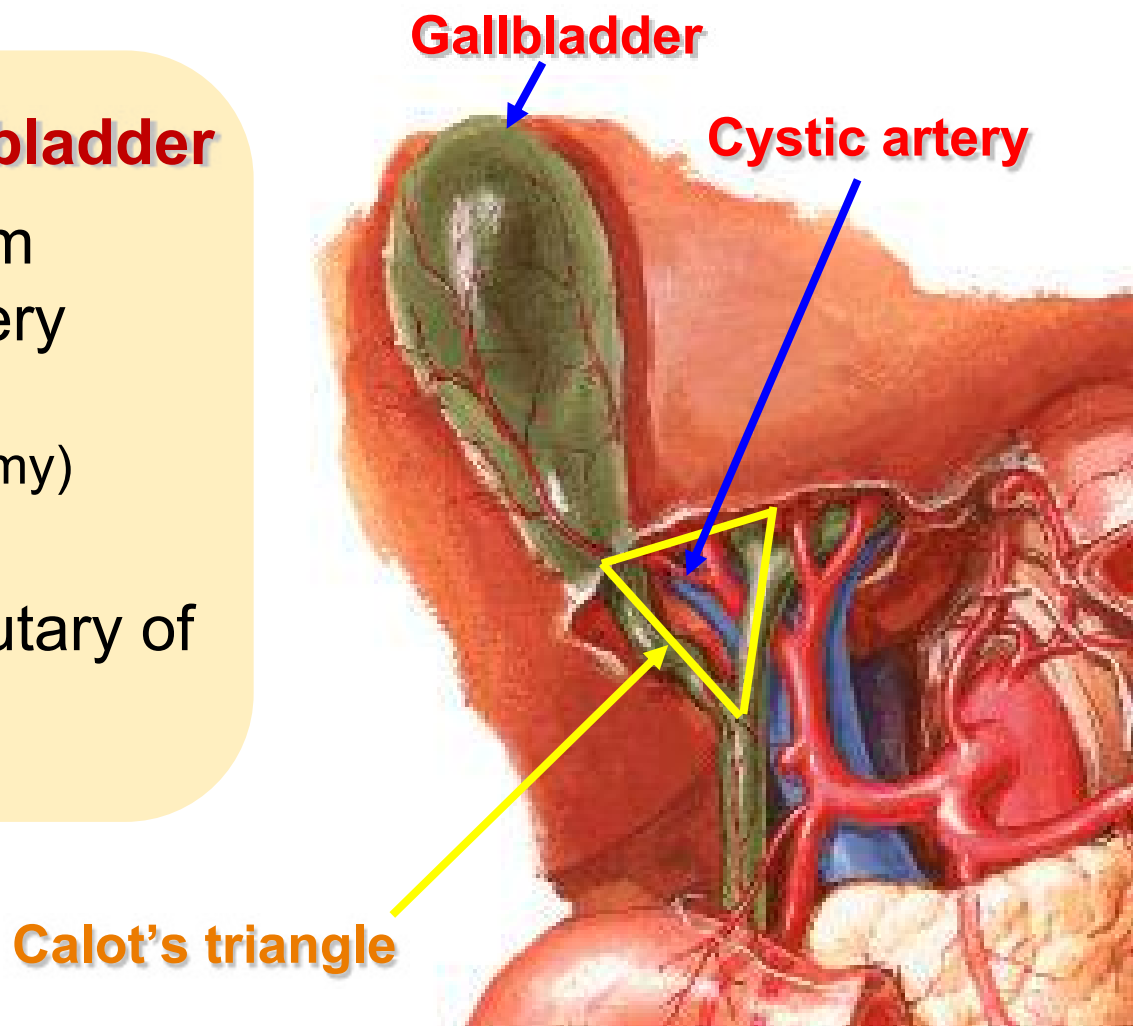
Internal surface : folds, spiral folds and crypts of Luschka



Gallbladder

Blood supply of gallbladder

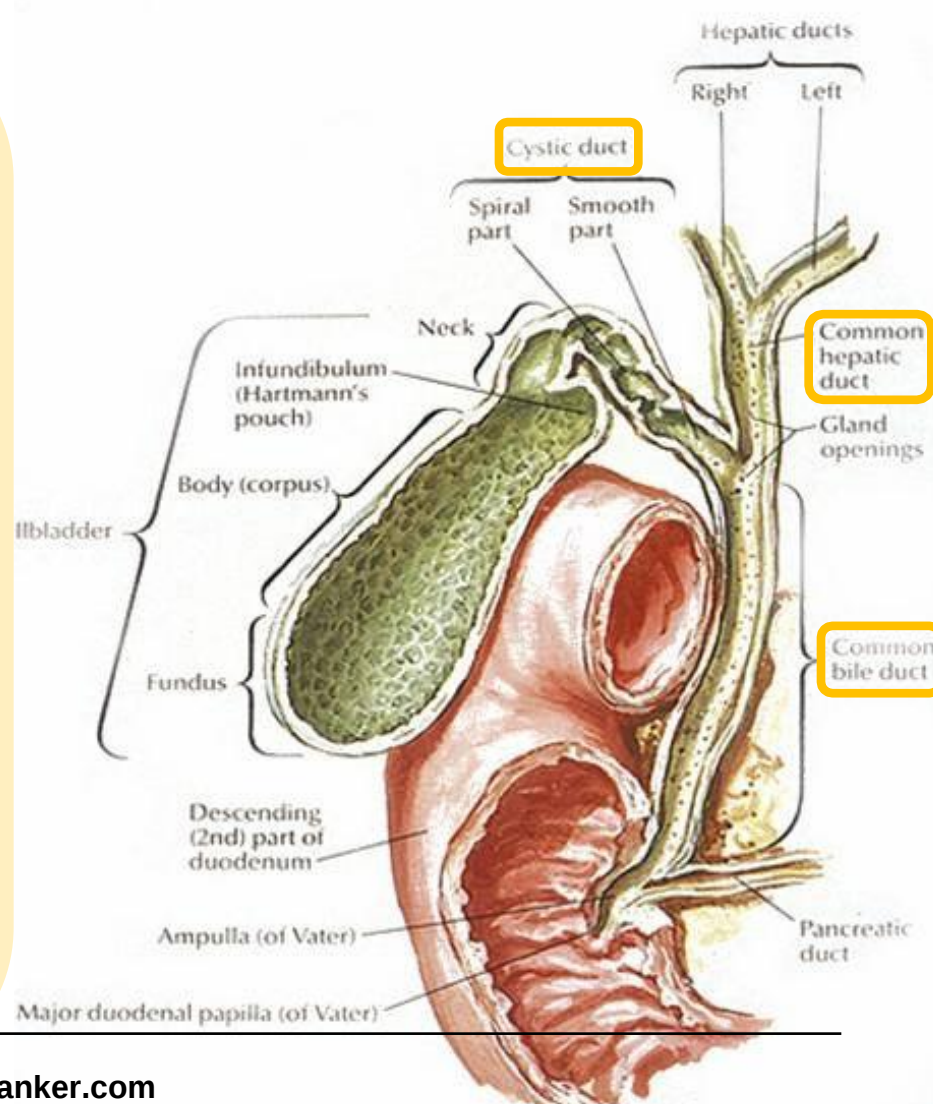
1. **Cystic artery** from Right Hepatic artery
(in Calot's triangle
→ Cholecystectomy)
2. **Cystic vein** : tributary of Portal vein



Biliary tract

1. **Cystic duct** : ~ 3-4 cm
: spiral valve of Heister
2. **Common hepatic duct**
: ~ 3.5 cm
: from Rt. & Lt. hepatic ducts
3. **Common bile duct**
: ~ 7-8 cm, Dia- 6mm

1+2 → 3



Biliary tract

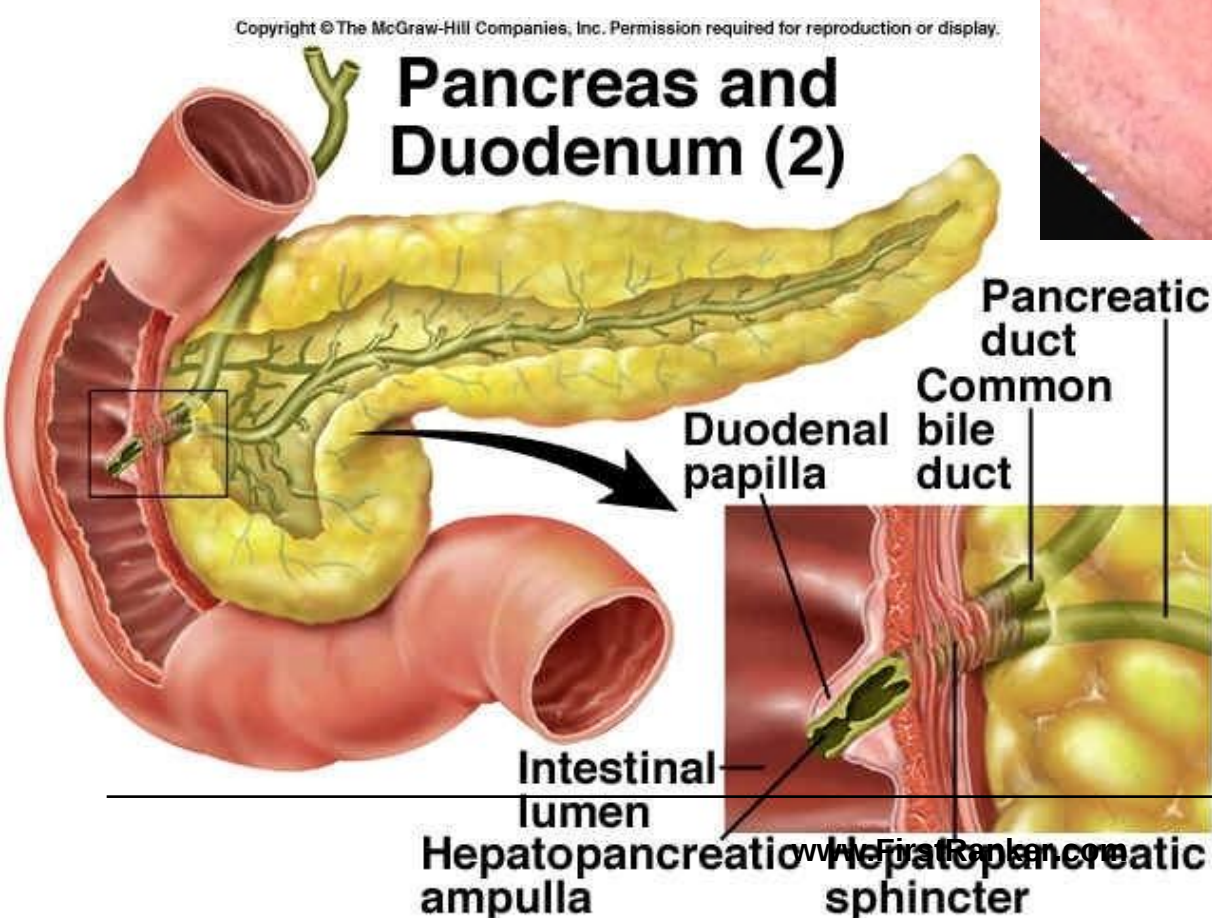
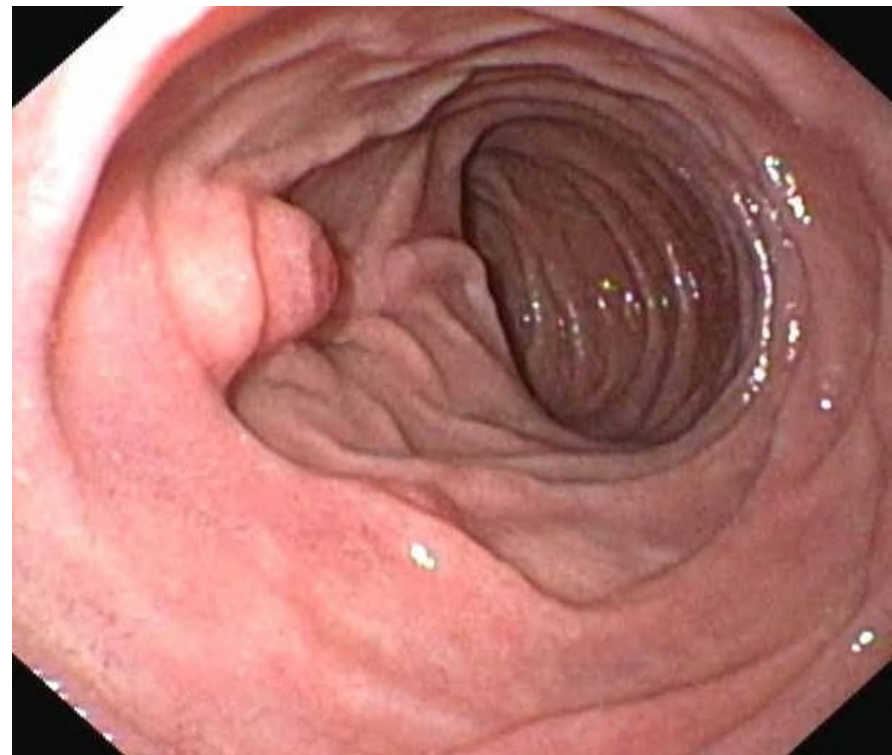
Common bile duct has 4 parts

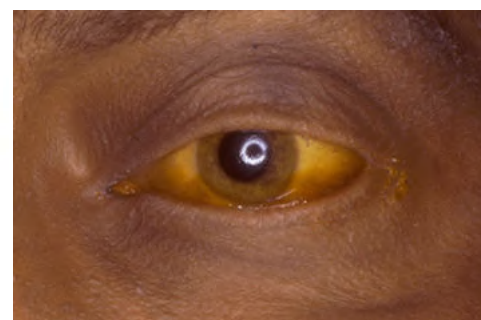
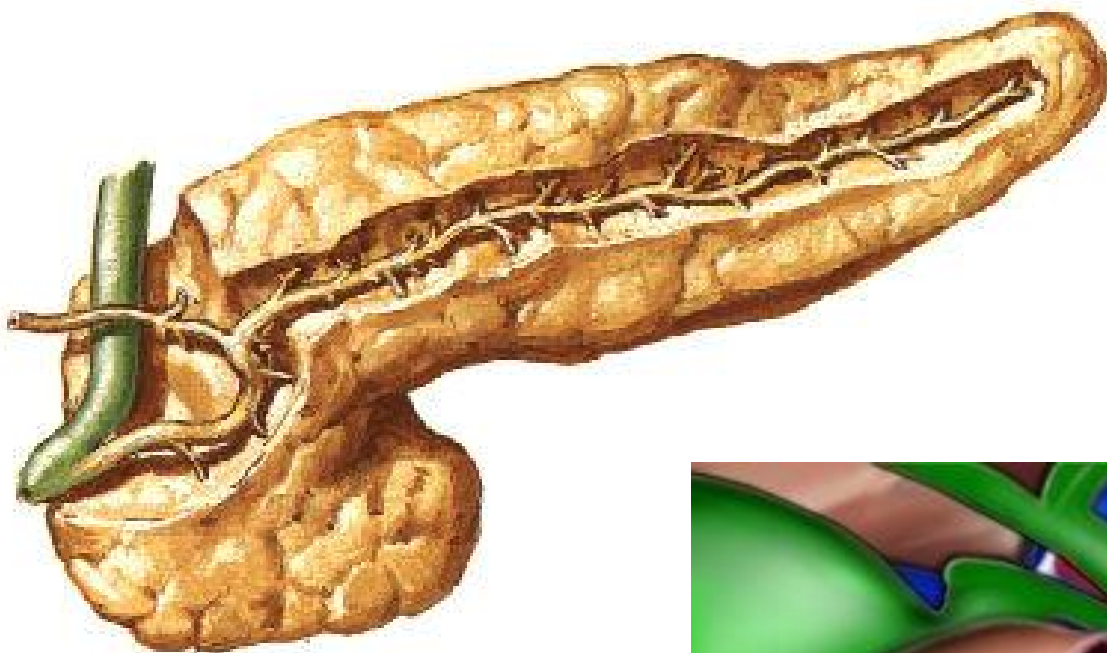
- Supraduodenal- Liver---portal v. epi. For.– Hep. Art.
- Retroduodenal
- Infraduodenal
- Intraduodenal

Common bile duct + Major pancreatic duct



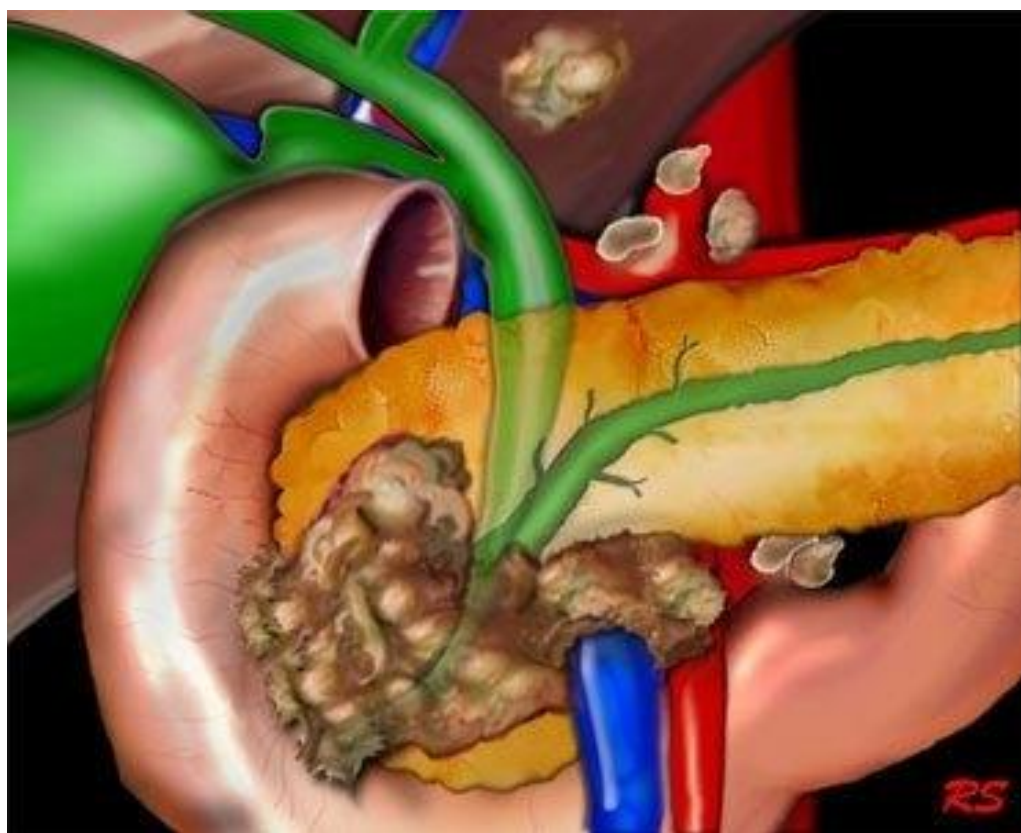
Hepatopancreatic ampulla (**Ampulla of Vater**)
Opening is Greater duodenal papilla in 2nd part of duodenum (surrounded by **Sphincter of Oddi**)





Icteric sclera

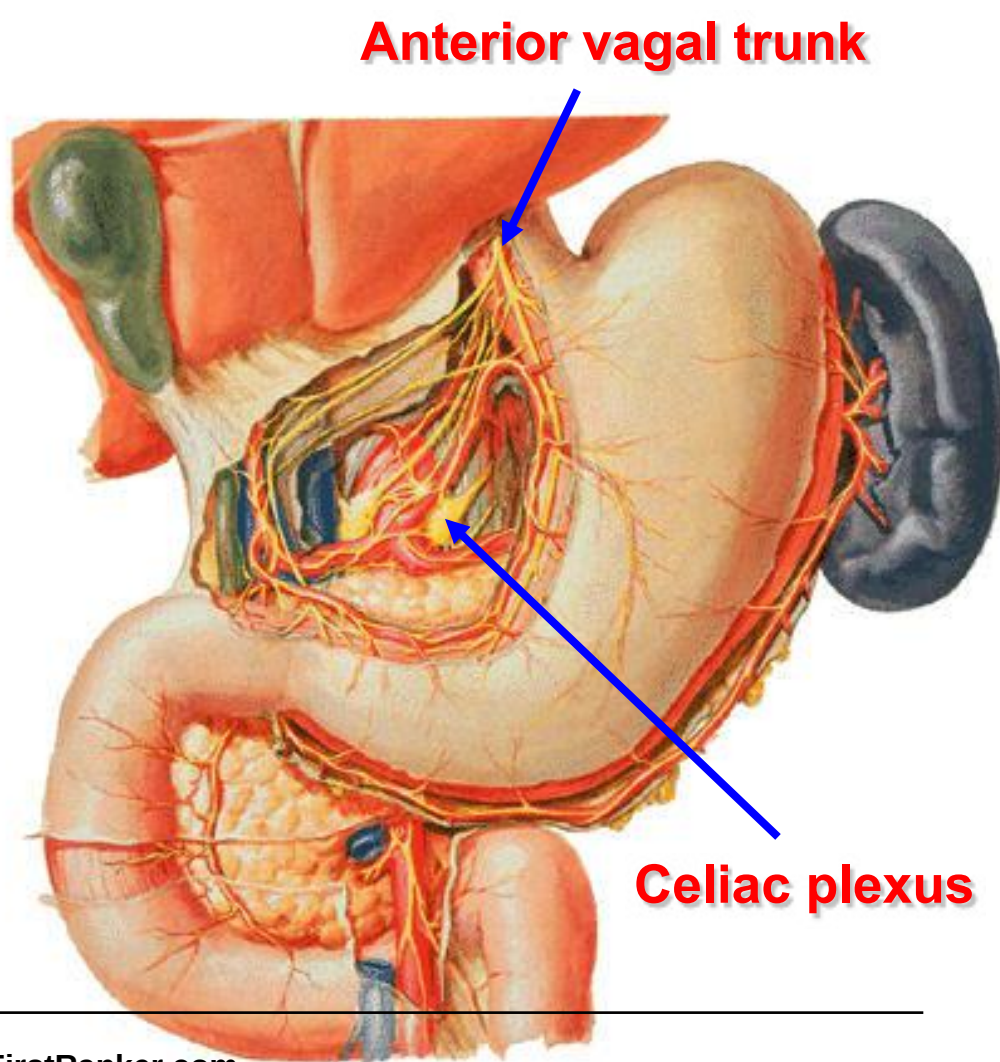
Compression of common bile duct resulted in obstructive jaundice



Biliary tract

Nerves of Gallbladder

- **Symp** : Celiac plexus
- **Parasymp** : Ant. and Post. vagal trunks



Anterior vagal trunk

Celiac plexus

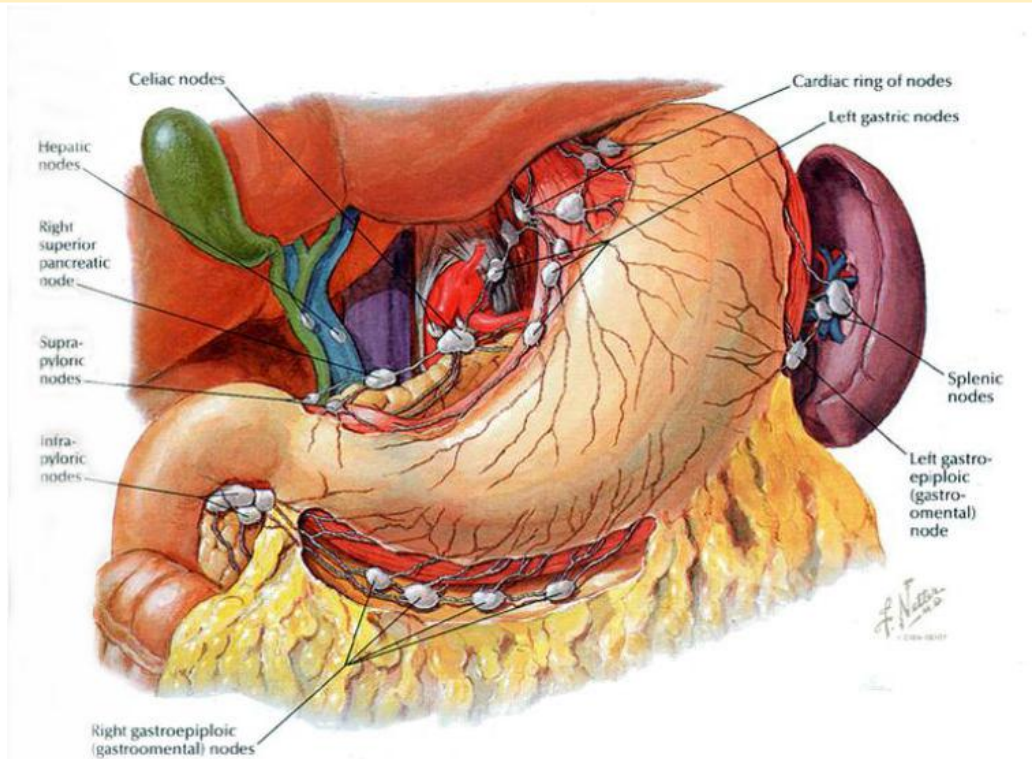
Biliary tract

Lymphatic drainage of Gallbladder

- Drain to Hepatic nodes of cystic nodes



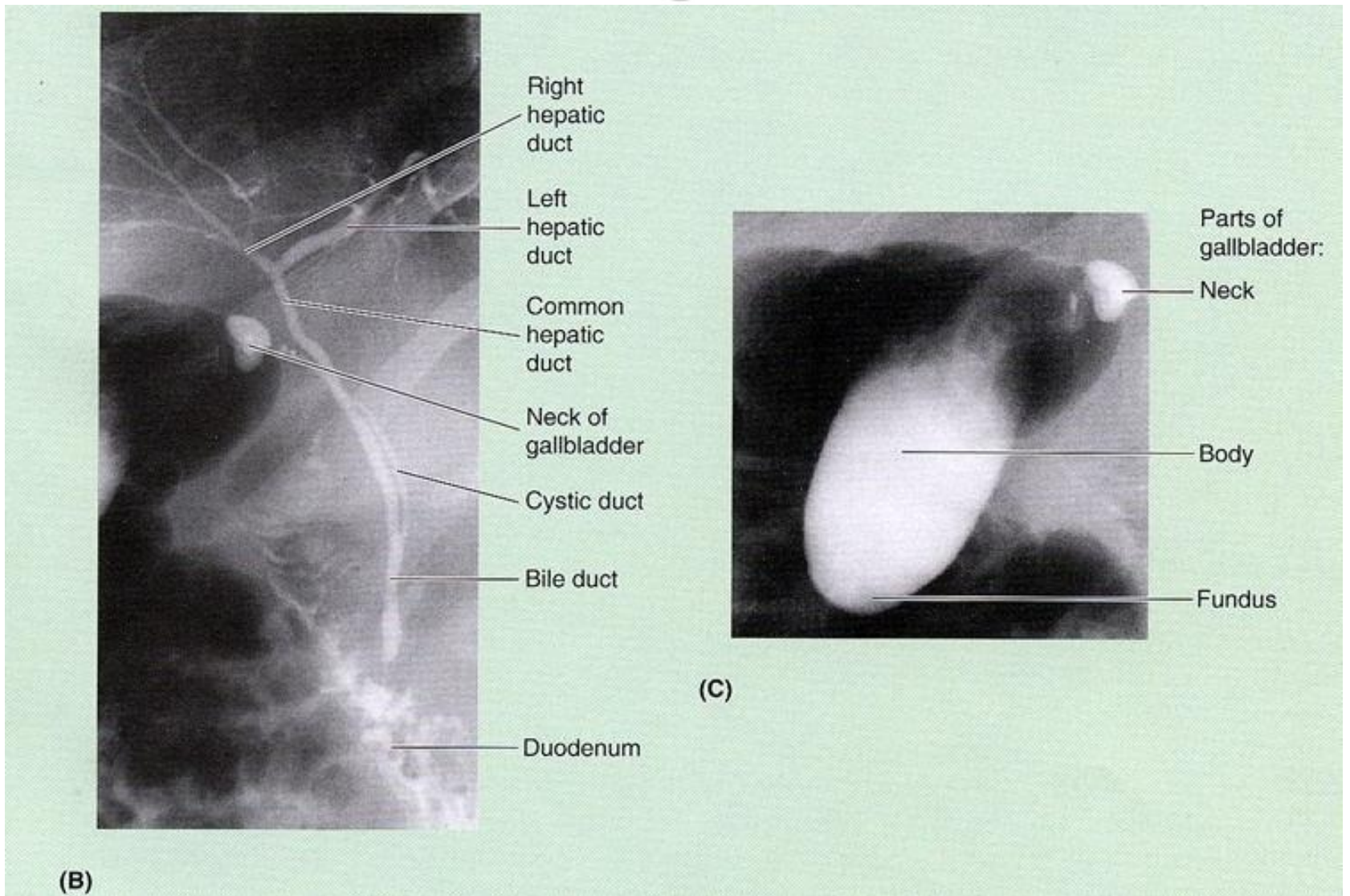
Celiac nodes



Applied Anatomy

- Cholelithiasis
- Cholecystitis
- Murphy's sign
- Courvoisier's law- dilatation of the G.B. occurs only in extrinsic obst. Of CBD , fibrosis
- Jaundice

Radiograph of gallbladder & biliary tracts



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