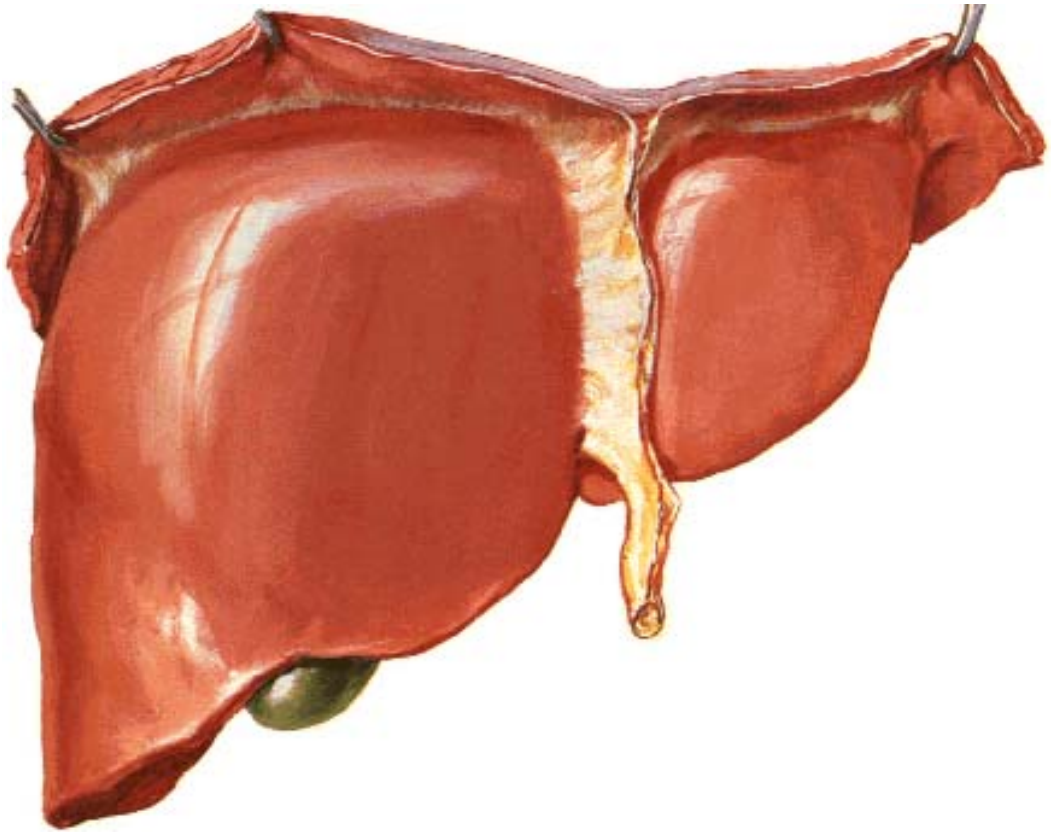
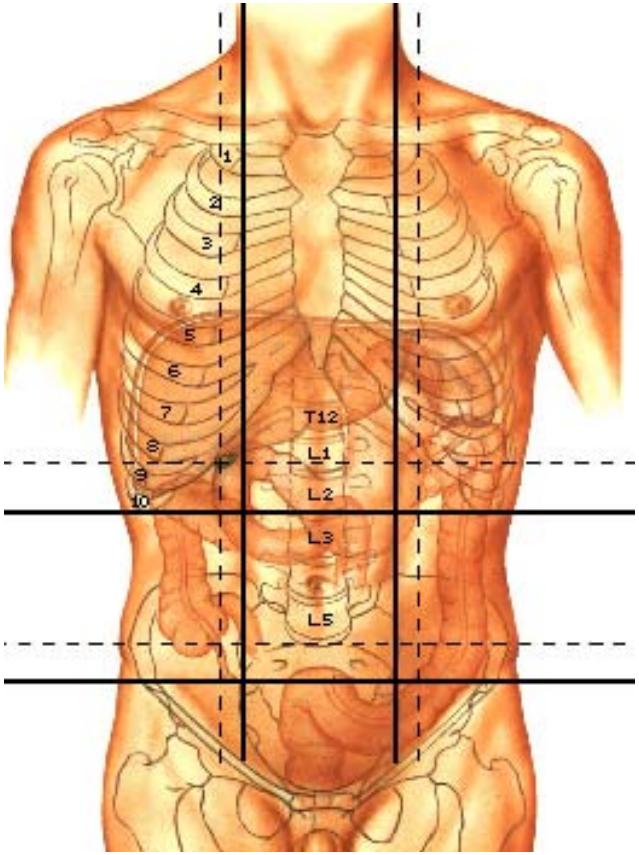
Liver

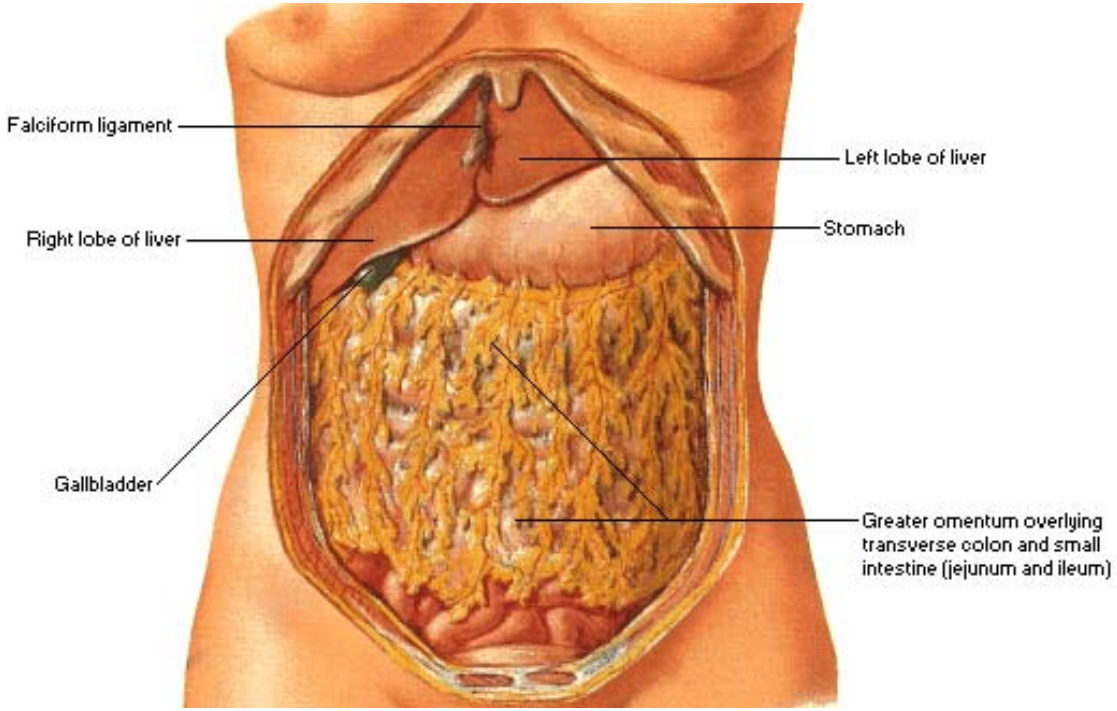
- Hepatic
- Largest Gland
- Wedge Shaped (Resemble 4 sided pyramid & apex on left



- Exocrine (secrete bile) as well as endocrine
- (Liberate Glucose from Glycogen , Pl. proteins ,
- heparin - Directly into blood stream
- Involved in metabolic , detoxification activities

- Occupy - Rt. Upper Quadrant
- Occupy Regions –
  - ❖ Rt Hypochondrium,
  - ❖ Epigastrium-upper part
  - ❖ Lt. Hypochondrium – Partly up-to Lt. lateral plane





Liver

- Weight- 1.4 – 1.8 KG

  - At birth – 150 gms.

Proportionate weight – Higher in children

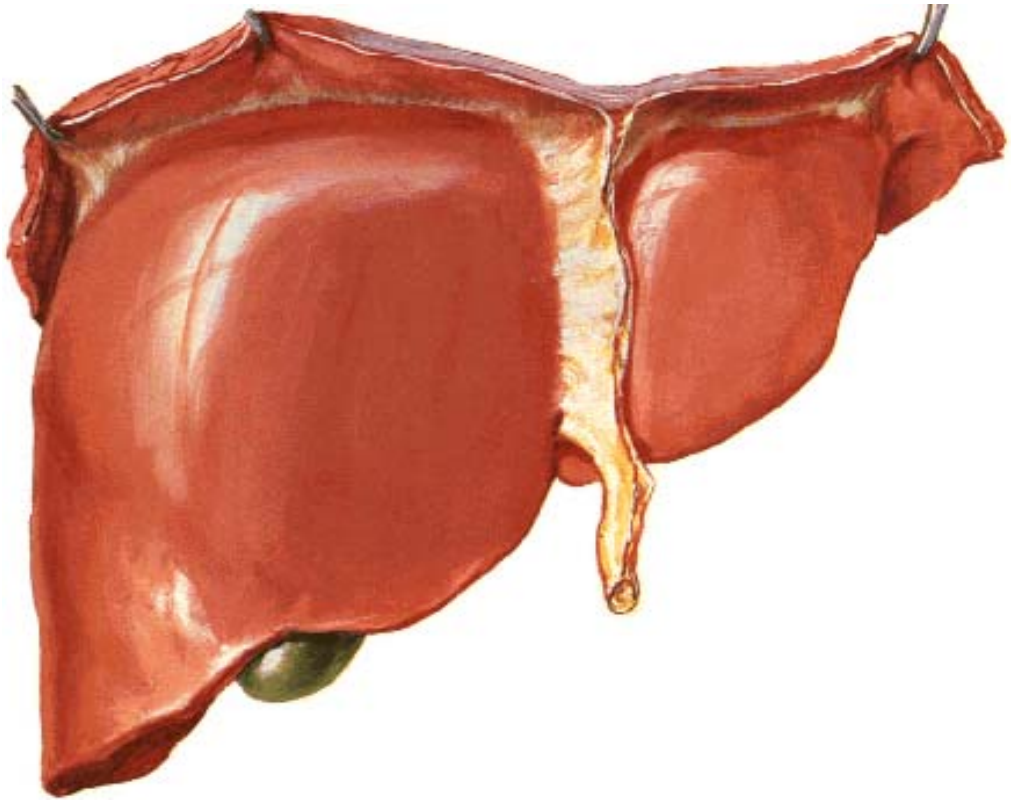
Adult- 1/36th of body Wt

New Born- 1/18th of body Wt

Due to Haematopoietic Function

Liver

- Reddish brown
- Soft , solid
- Friable to touch
- Highly Vascular
- Bleed continuously
- Undergo rapid mitosis
- Move with respiration
- Essential for life



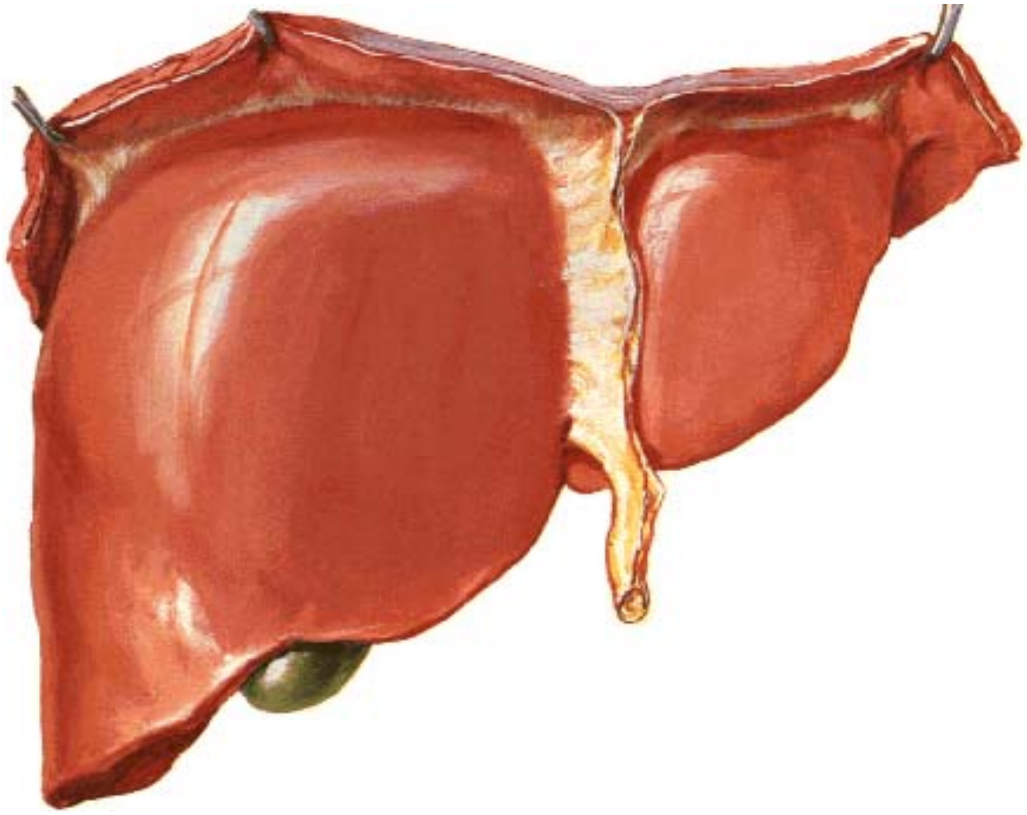
Liver

Factors keeping in position

- Intra-abdominal pressure maintained by tone of intra-abdominal muscles
- Hepatic veins opening in IVC
- Ligaments of Liver

Liver

- Surfaces
- Borders
- Lobes
- Fissures
- Porta Hepatis
- Bare area
- Ligaments & peritoneal reflections



2 Surfaces

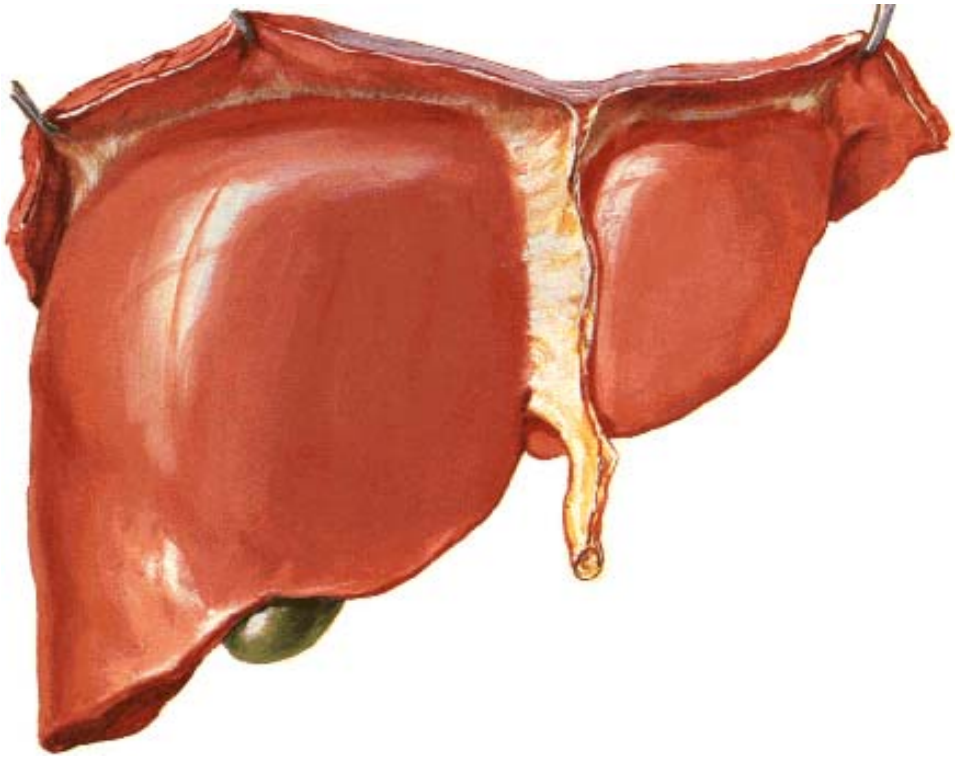
- Parietal
- Visceral (Inferior)

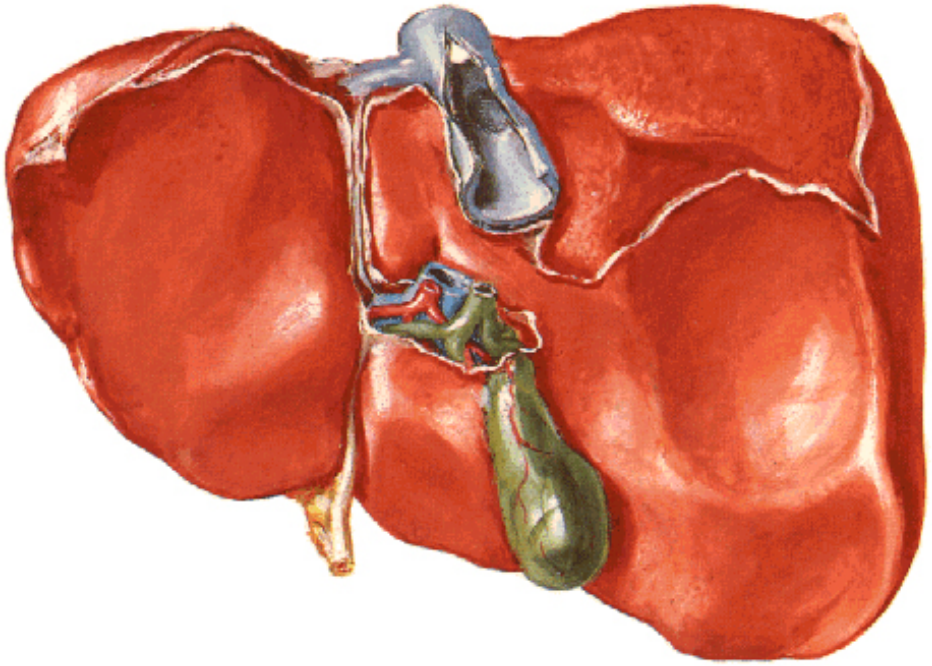
Subdivisions of Parietal

- Superior
- Anterior
- Rt. Lateral
- Posterior

3 Borders

- Postero-superior
- Postero-inferior
- Inferior

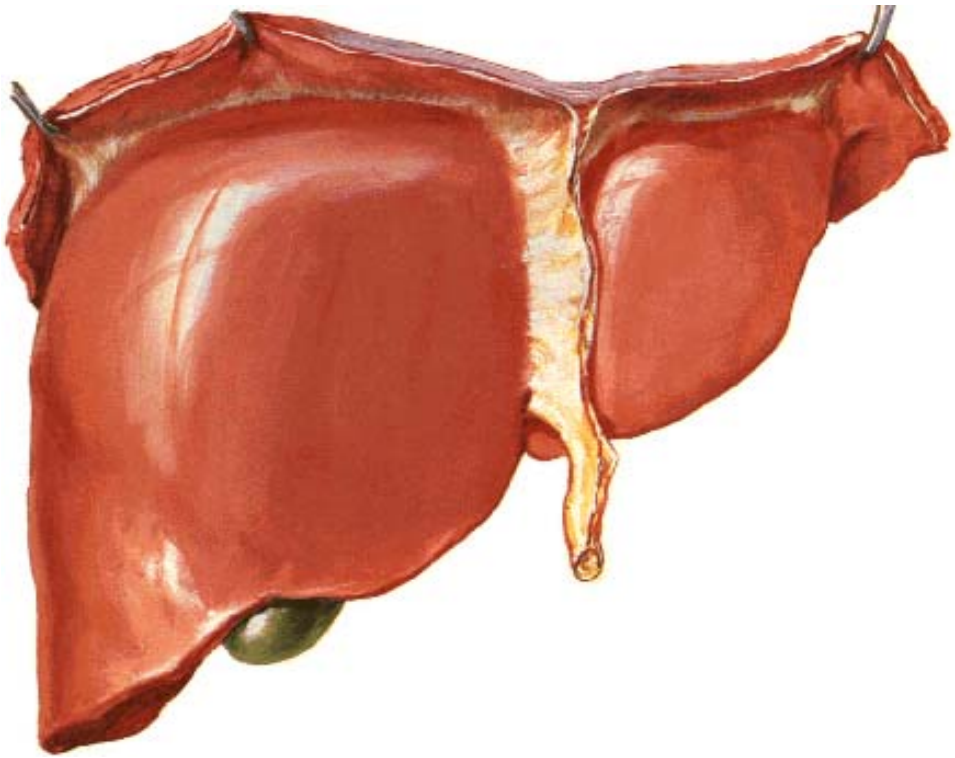




Borders

Inferior border

- Sharp
- Separate inferior surface from Ant. & Rt. Lateral



Features

Interlobar notch –

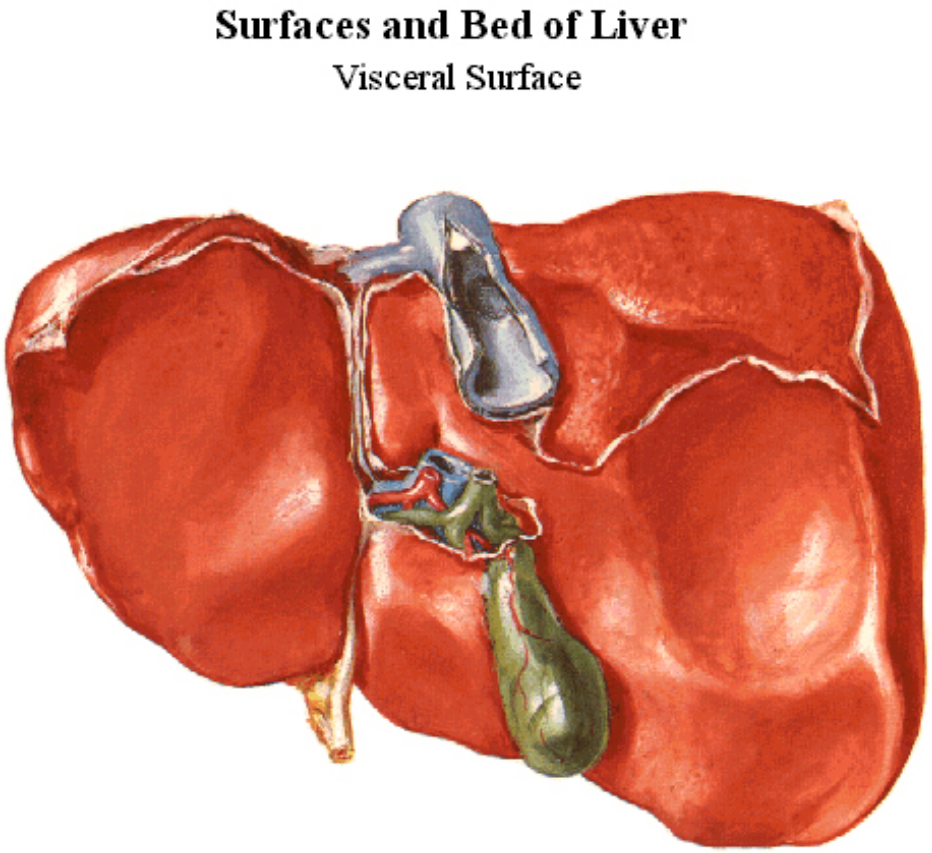
Lodges Ligamentum Teres (Left Umbilical Vein)

Cystic notch –

Lodge fundus of Gall bladder

Postero-Inferior Border

Separate Inferior From Posterior surface



Extent – From Rt. To Lt.

- Lower layer of Coronary Lig.
- Lower end –Vena caval groove
- Tr. Line across caudate lobe
  Above caudate & papillary process
- Ant.(Lt.) lip of fissure for
  Lig. Venosum (Ductus Venosus)
- Lower end of Oesophageal goove
- Sharp post. Margin of Lt. lobe

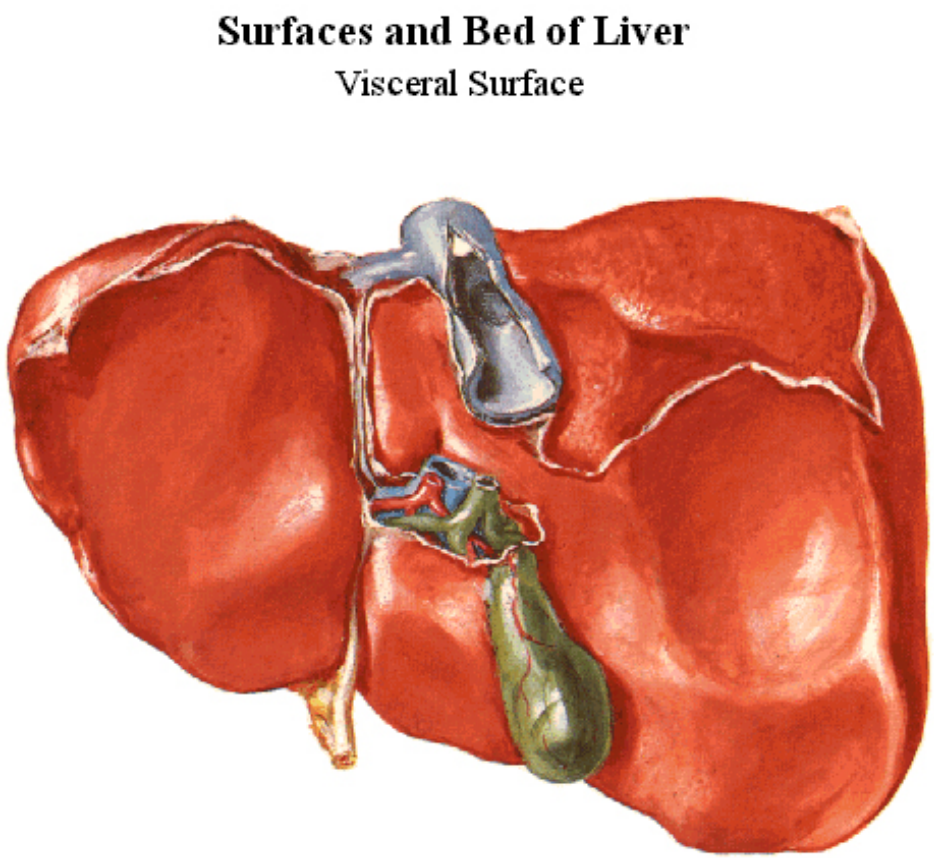
Postero- Superior Border

Separate posterior

from superior surface

Demarcation

- Upper layer of coronary Lig.
- Vena caval groove (upper End)
- Lt. Triangular Lig.



Superior Surface

- Moulded with diaphragm ,Convex on sides & depressed in middle (Cardiac impression)

Relation

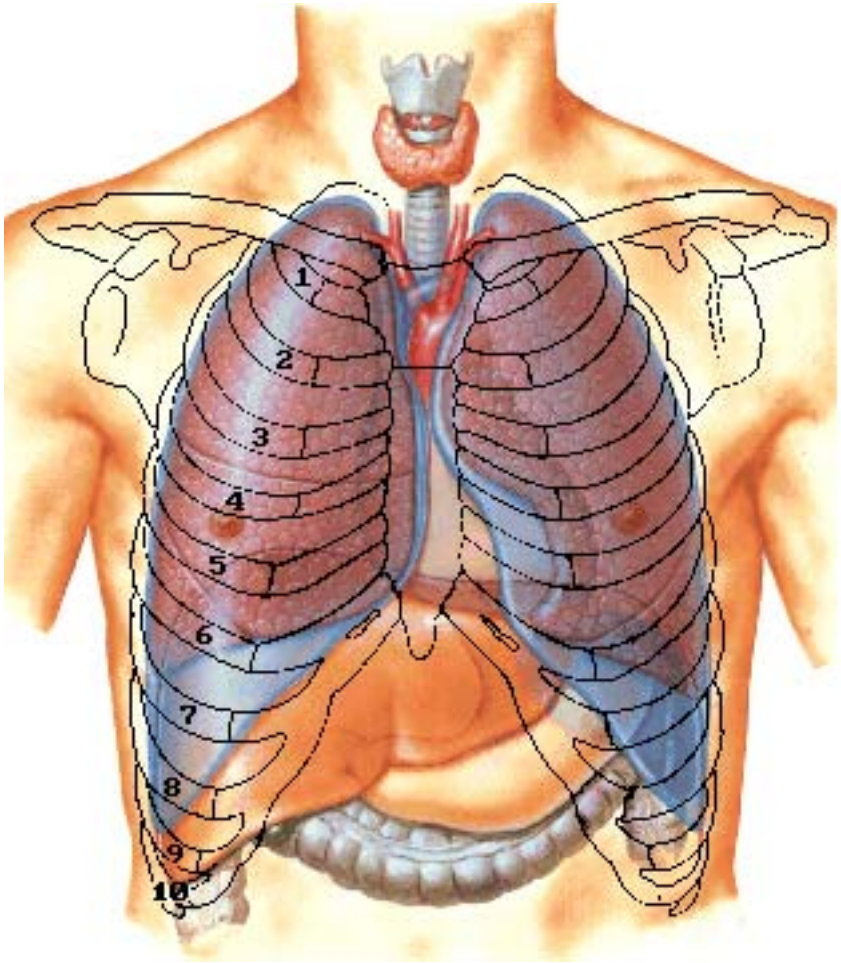
- Corresponding lung & pleural sac above the diaphragm
- Above central tendon – inferior surface of heart separated by fibrous pericardium & pericardial sac

Rt. Lateral surface

- Convex
- Covered with peritoneum

Relation

- Undersurface of Rt. Part of Diaphragm
- 7^{th} – 11^{th} Rib (Rt. side)



Rt. Lateral surface

Between ribs & Pleura

Upper 1/3rd

- Lower border of Rt. Lung (Lung extend up-to 8th rib in mid-axillary line)
- Rt. Pleural sac

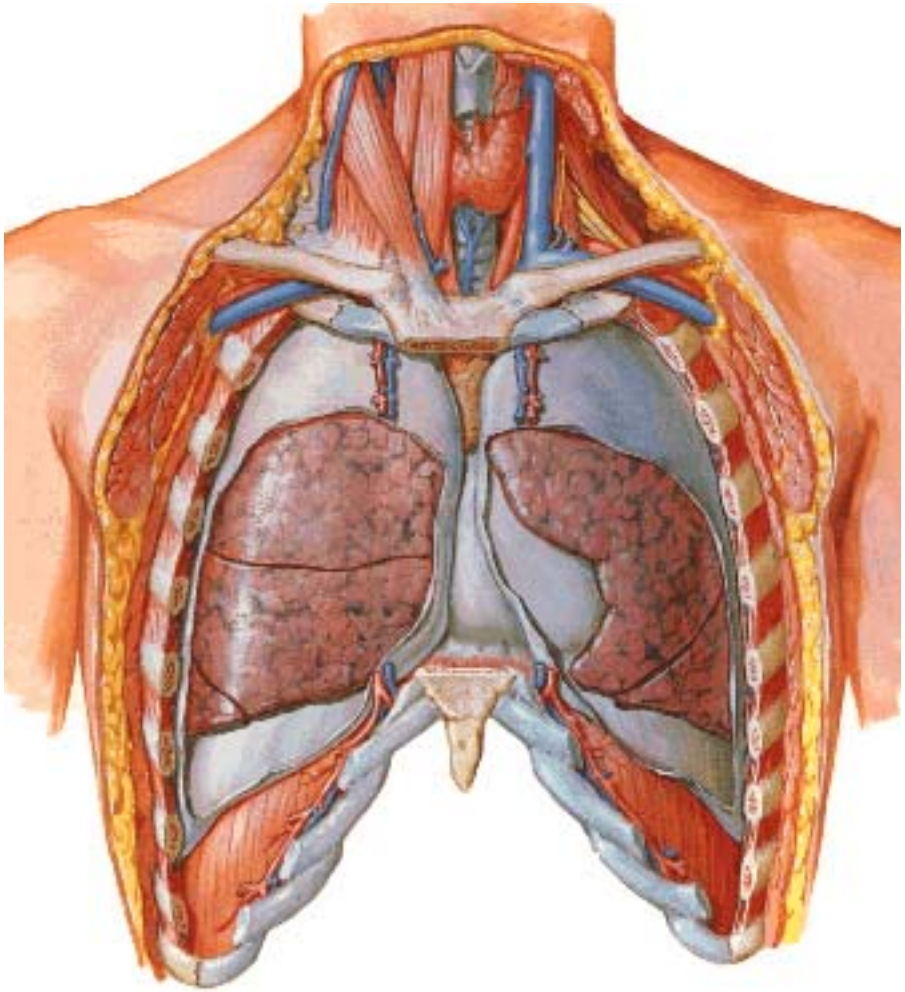
Middle 1/3rd

- Costo-diaphragmatic recess of Rt. Pleura (Pleura Extend up-to 10th rib in mid-axillary line)

Lower1/3rd

No Lung , No Pleura

Diaphragm comes in contact with 10th & 11th rib



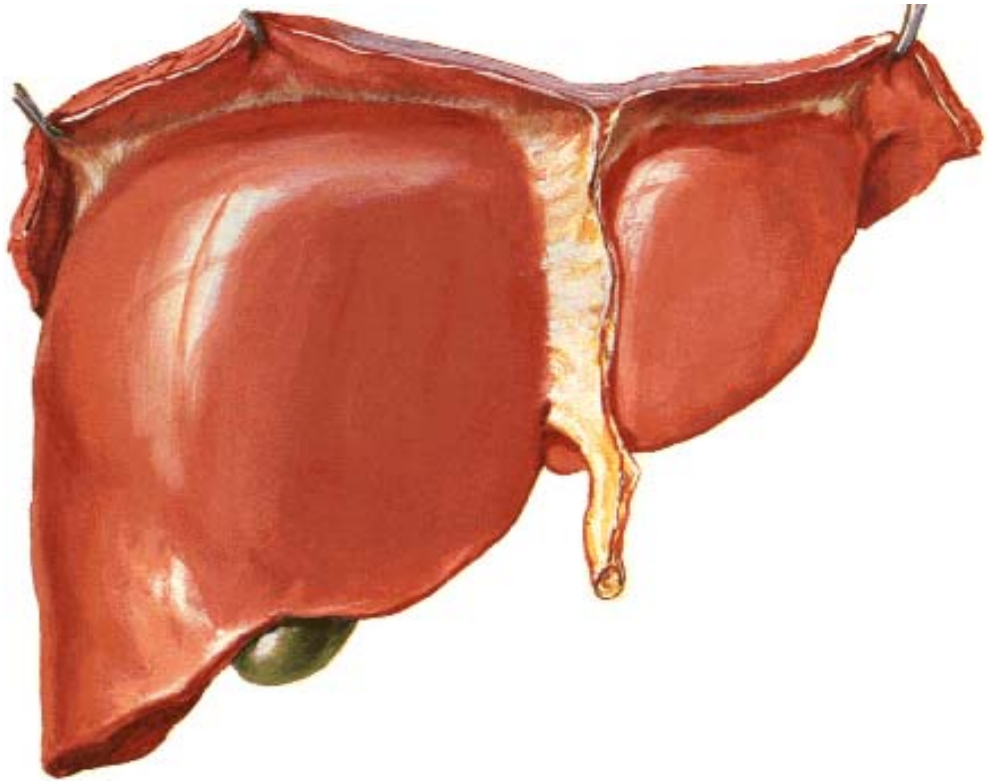
Clinical Importance

Biopsy of Liver

- Done in forced expiration
- Liver approached through Rt. 9^{th} or 10^{th} Intercostal space in mid axillary line to avoid damage to lung

Anterior Surface

- Roughly Triangular in outline
- Subdivided Anatomically into Rt & Lt lobes by the attachment of Falciform ligament
- Broad Rt part , narrow Lt. part & intermediate triangular portion

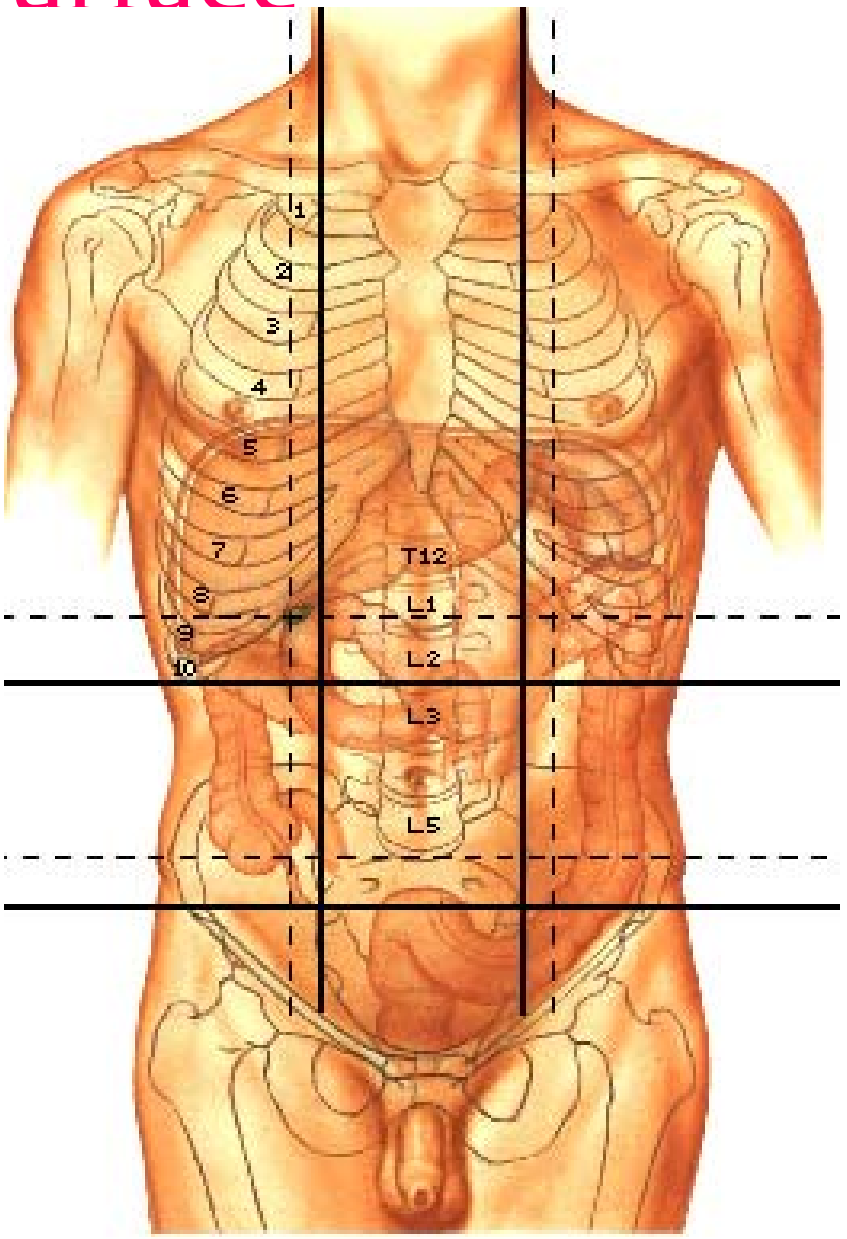


Anterior Surface

Relations of Right Part

Lie below Rt. Costal margin

- Diaphragm
- 6^{th} – 10^{th} rib – Rt. Side
- Lower margin of Rt. Lung & pleura



Anterior Surface

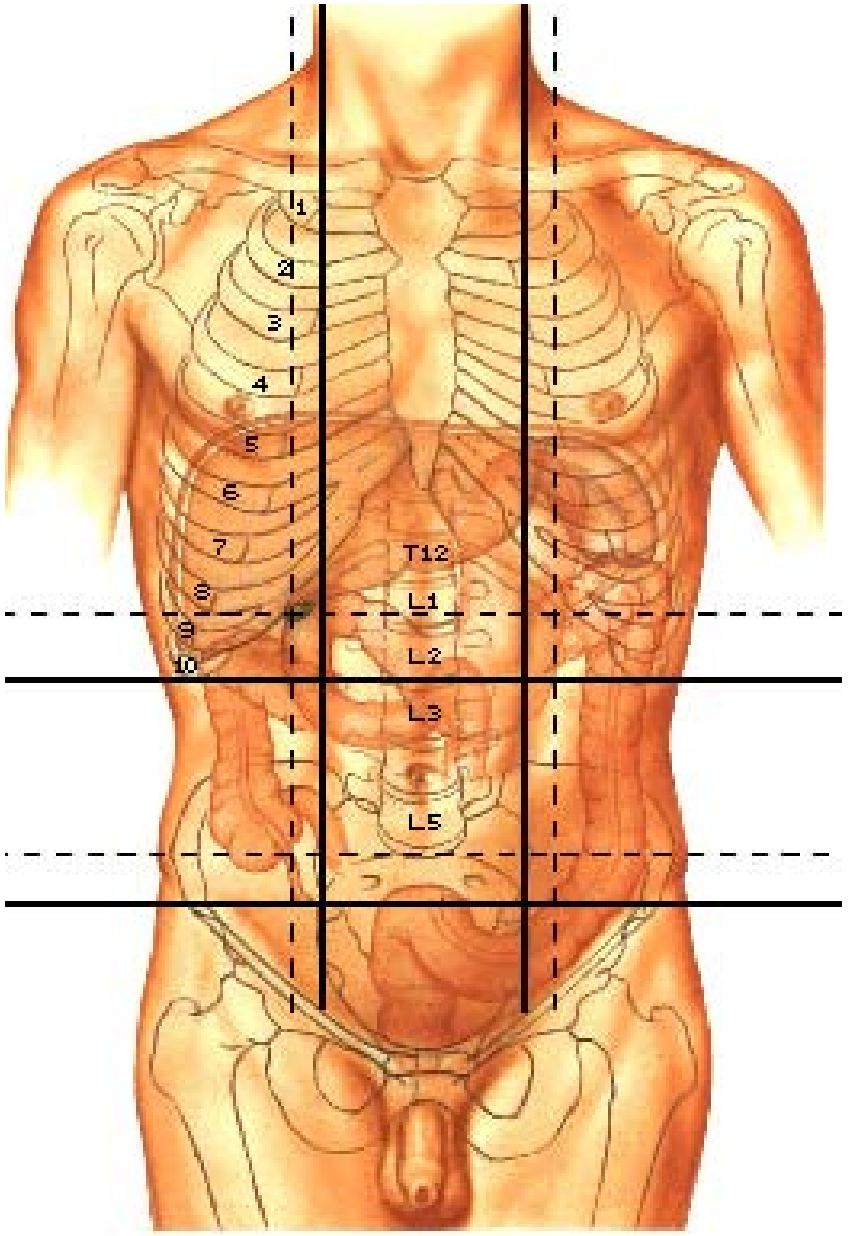
Relations of Left part

Lie below Left costal margin

- Diaphragm
- 7^{th} & 8^{th} left costal cartilages

Intermediate part

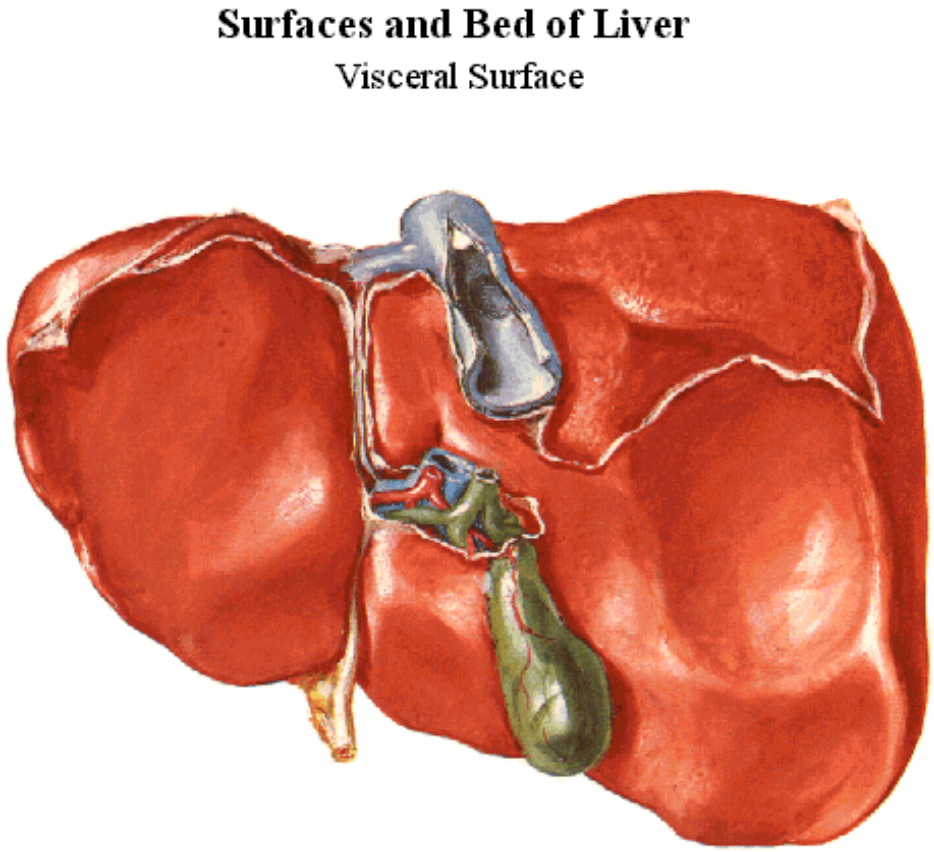
- Xiphoid Process
- Ant. Abdo. Wall



Posterior Surface

- Lie b/w Postero-Sup. & Postero – Inf. Border
- Deeply concave backward (for V. Column)

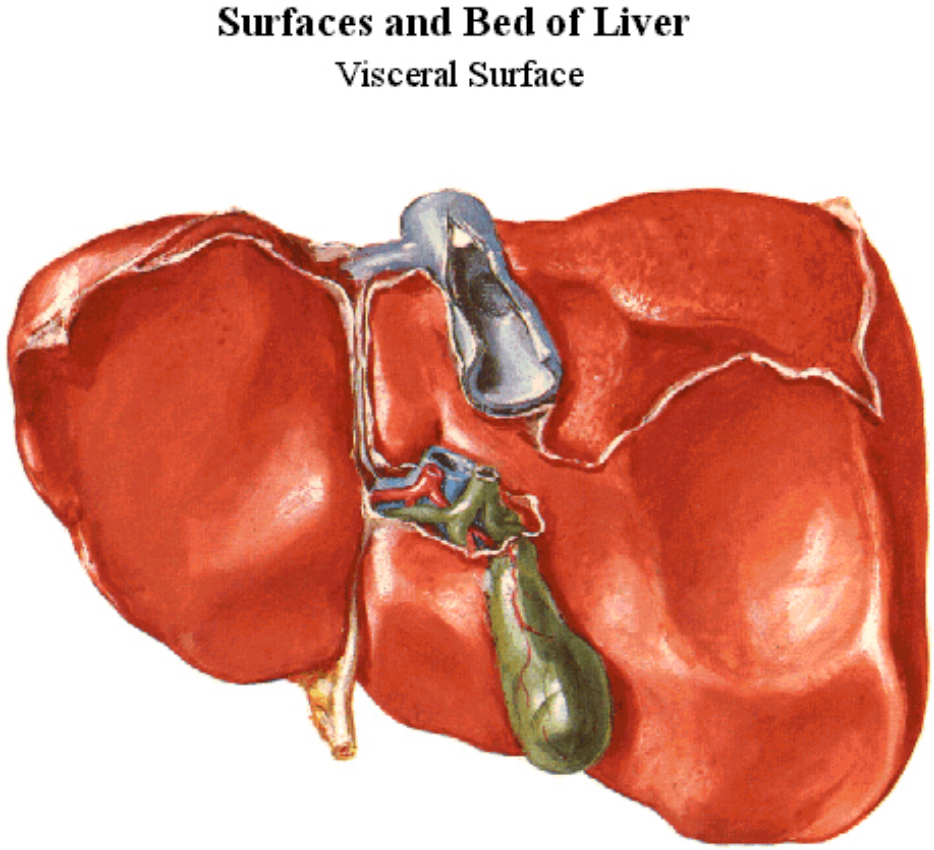
  Called vertebral groove
- Convex on Rt. Occupying Rt. Para-vertebral gutter



Posterior Surface

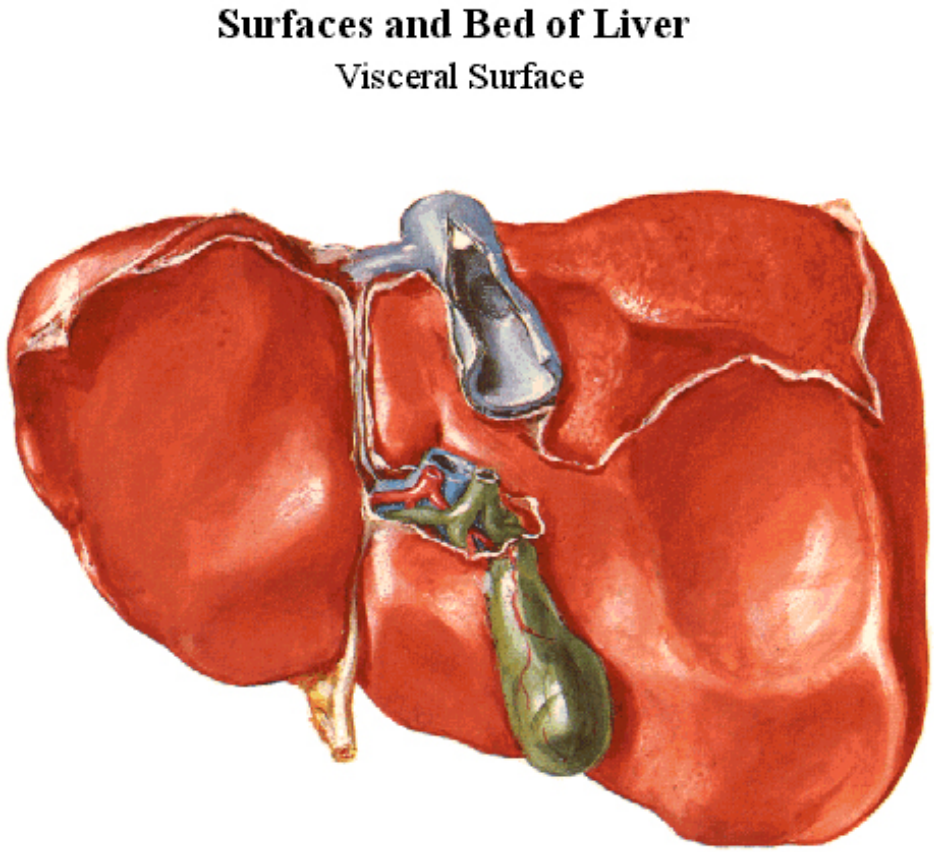
Features from Right to Left

- Largest bare area
- Groove for IVC
- Caudate lobe
- Fissure for Ligamentum Venosum
- Groove for Oesophagus



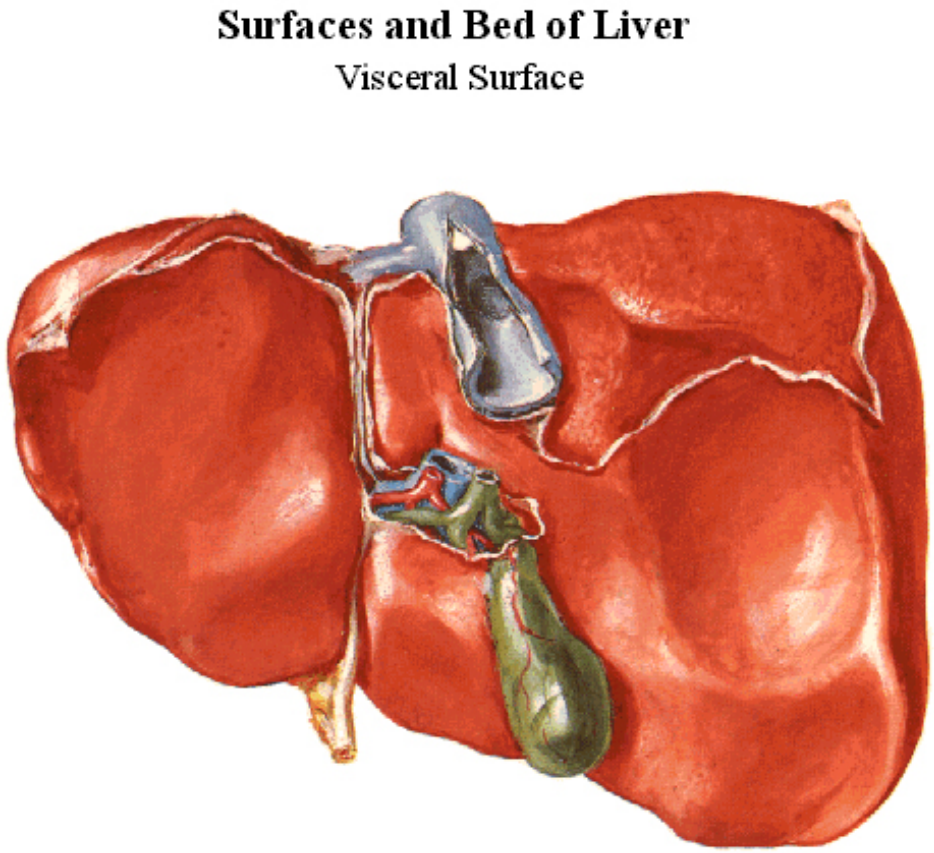
Largest Bare Area

- On post surface of Rt. Lobe
- Triangular shaped
- Apex – Rt. Triangular Ligament
- Base – Groove for IVC
- Upper & lower limits – Sup. & Inf. Layer of coronary ligament



Groove For IVC

- Non peritoneal vertical groove
- Floor pierced by Hepatic veins
- Arranged in two groups , upper & Lower
- Devoid of valves
- Upper Gr.- Rt. , Intermediate & Lt.Veins
- Lower – usually two on left & one on Rt.



Caudate Lobe

Boundaries

- On Rt.-

Groove for Vena cava

- On Lt.–

Fissure for Lig. Venosum

- Above –

by Postero-Sup. Border

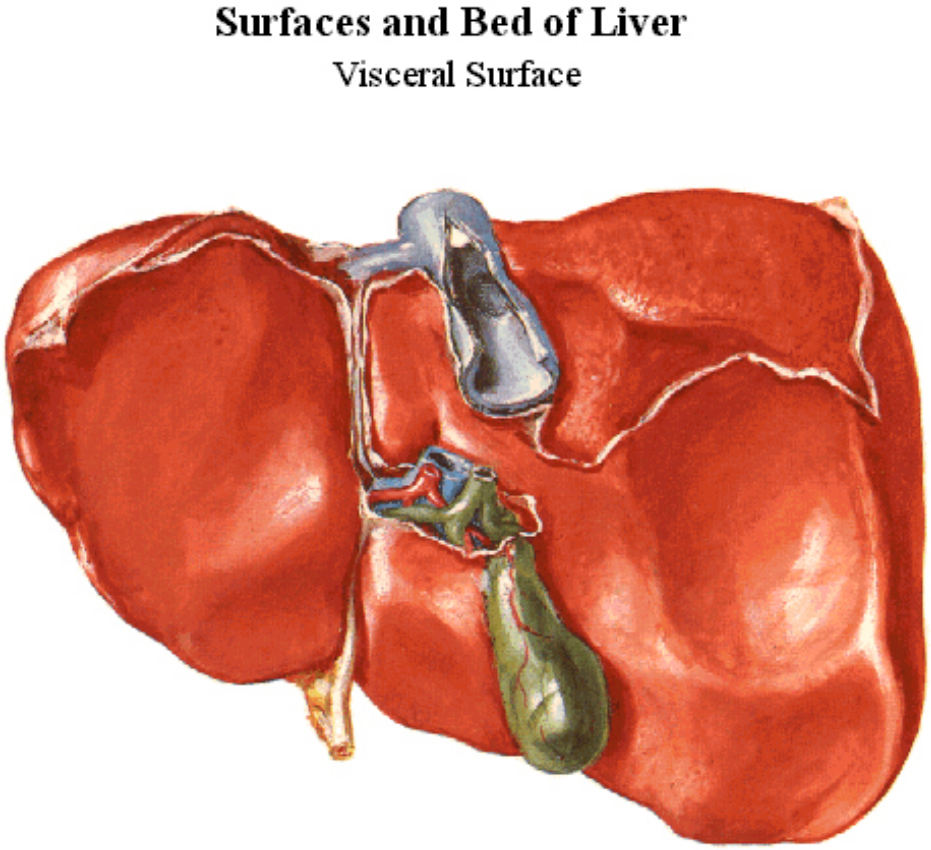
- Below –

by Porta Hepatis

Features

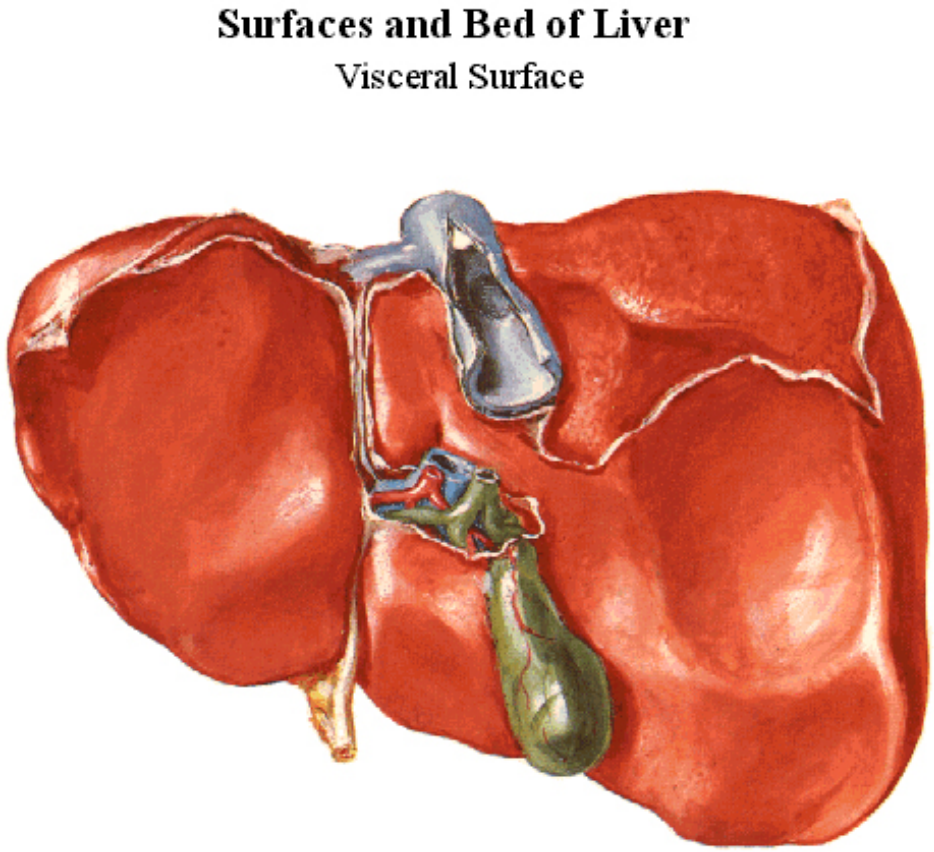
Caudate preocess (Rt.) &

Papillary process (Lt.)



Fissure for Ligamentum Venosum

- Deep Vertical Cleft
- Floor lodges Ligamentum Venosum (Remnant of Ductus Venosus of Foetal life)



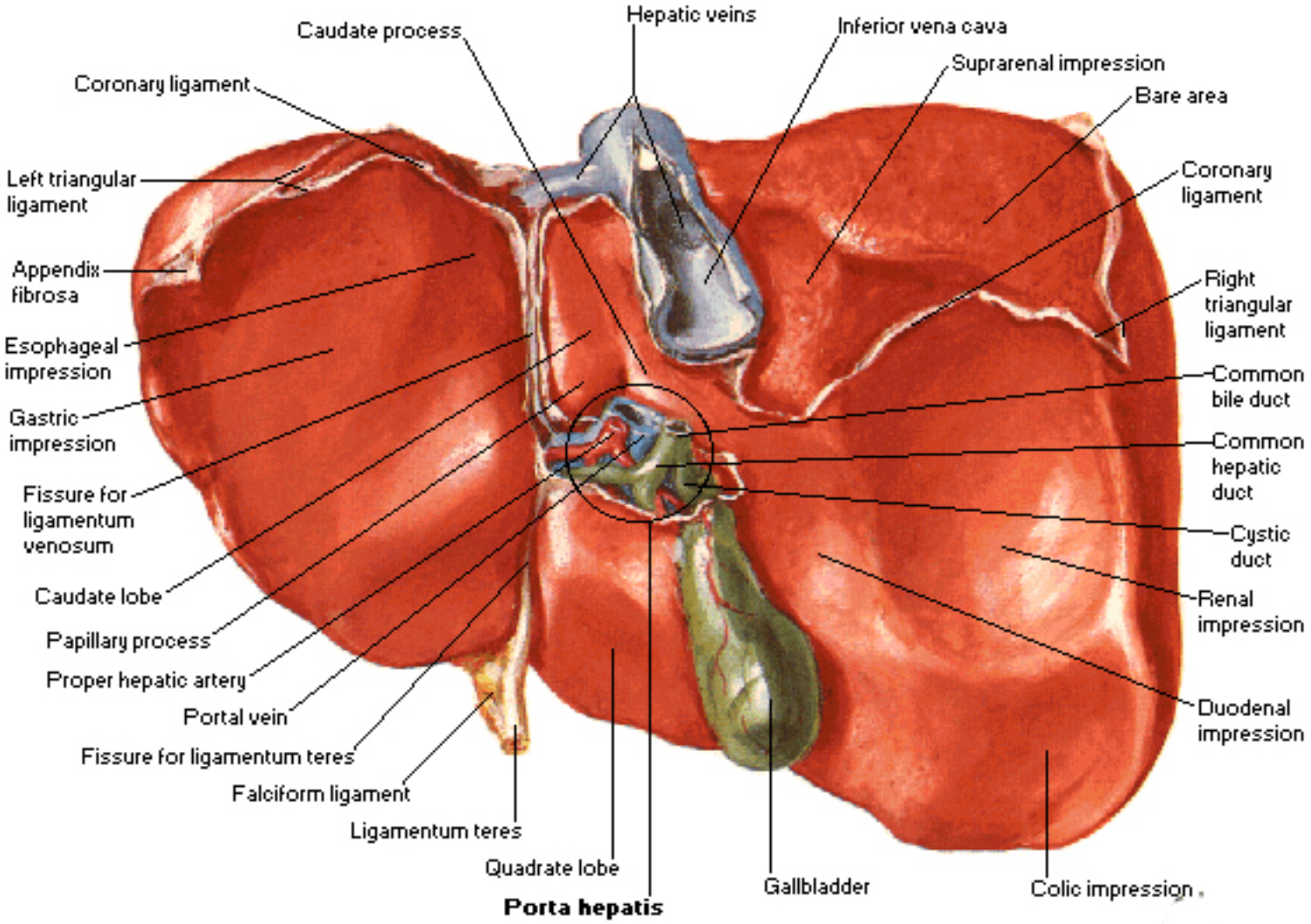
Inferior Surface

Impressions – Lt. To Rt.

- Gastric impression- fundus & body of stomach
- Tuber omentale
- Fissure for Ligamentum Teres
- Quadrate Lobe
- Porta Hepatis
- Caudate & papillary process
- Fossa for Gall bladder
- Duodenal impression (Junction Of Ist & Iind Part)
- Colic Impression (Rt. Colic Flexture)
- Renal Impression – ant surface & upper part(Rt. Kidney)

Surfaces and Bed of Liver

Visceral Surface



Porta Hepatis

- Transverse non peritoneal fissure – Gateway of liver
- Extent

from neck of Gb to Fissure for Lig. Teres & Venosum & intervene b/w –

Quadrate lobe in front &

Caudate process behind

Porta Hepatis

Structures Entering Liver

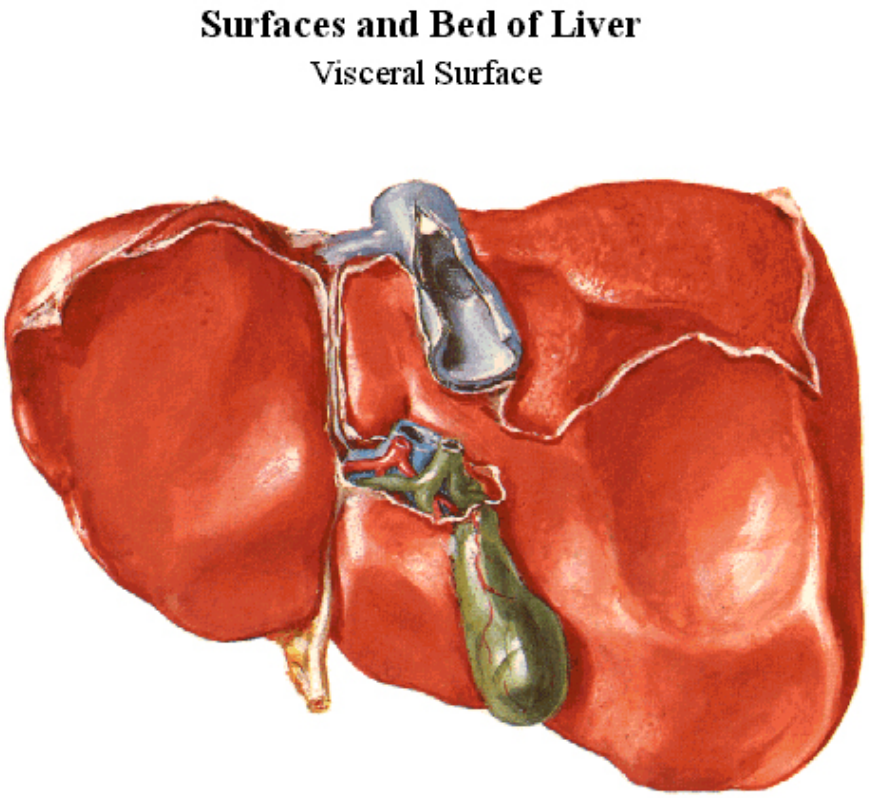
- Rt. & Lt. Branches of Hepatic Artery
- Rt. & Lt divisions of Portal vein
- Hepatic Plexus of Nerves

Structures Leaving

- Rt. & Lt. Hepatic ducts
- Lymphatics of Liver

Arranggement from before backwards

Ducts , Arteries & Veins

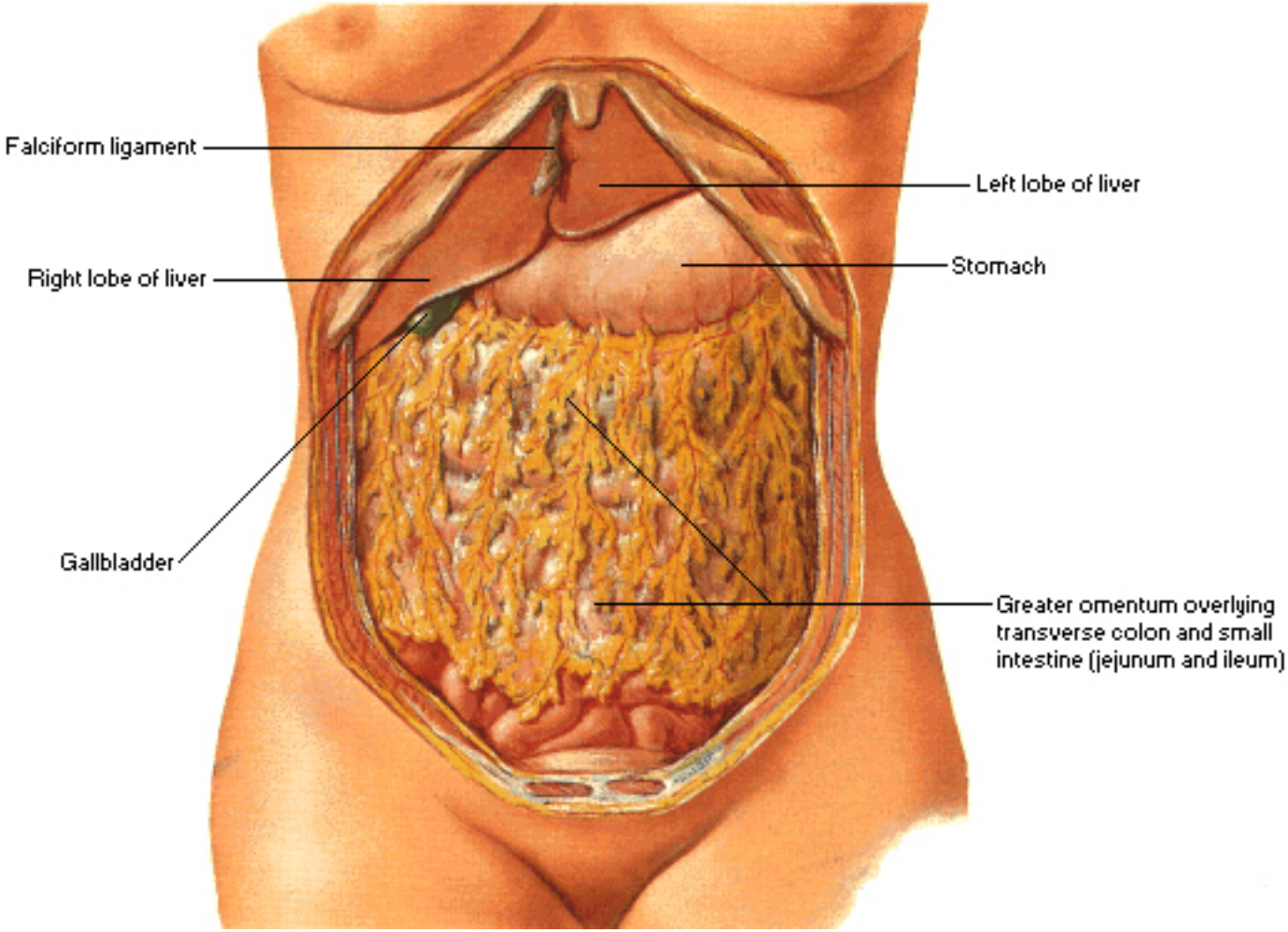


Liver

Applied Anatomy

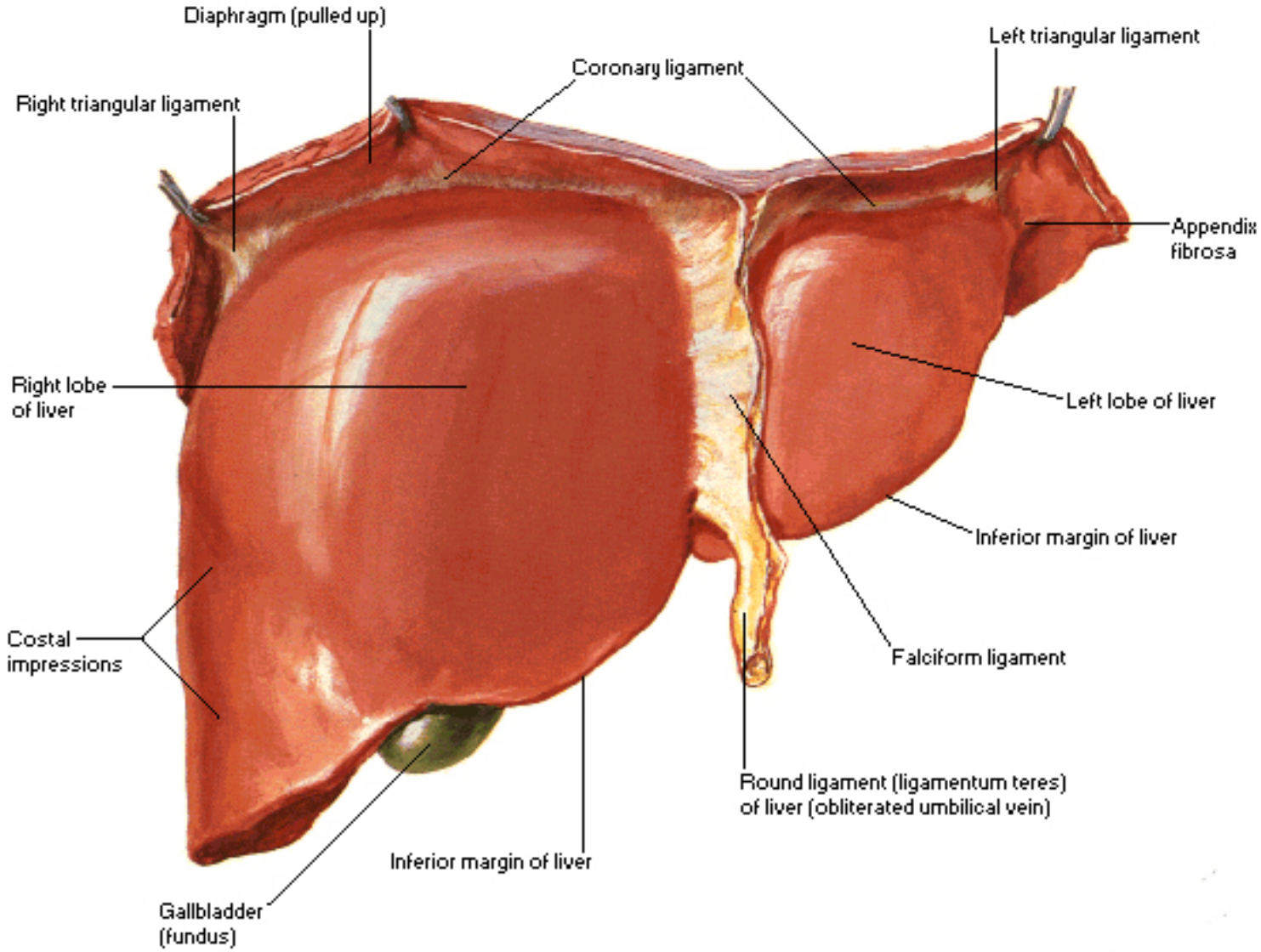
- Palpation
- Hepatitis
- Cirrhosis of Liver
- Amoebic Liver abscess
- Hepato-cellular Carcinoma

Greater Omentum and Abdominal Viscera



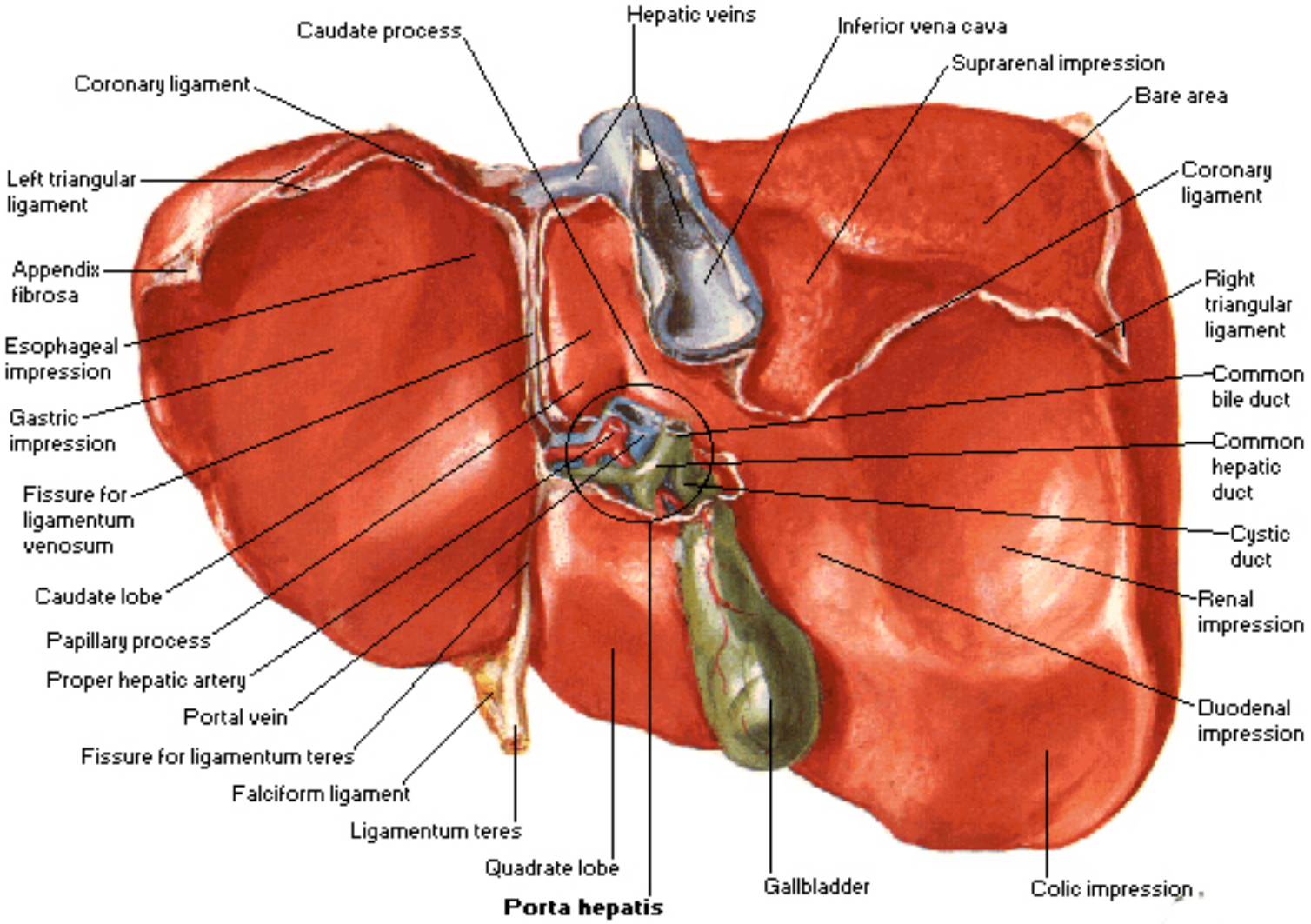
Surfaces and Bed of Liver

Anterior View



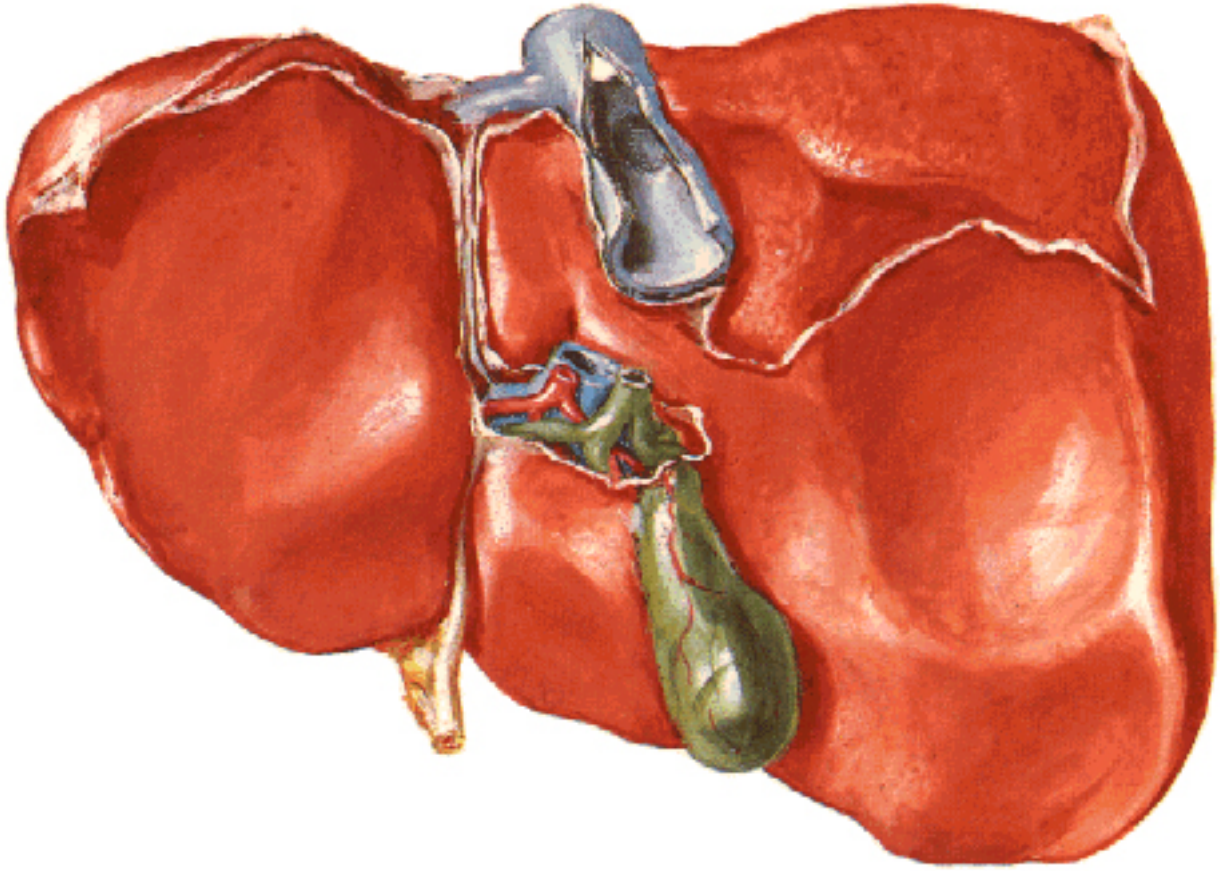
Surfaces and Bed of Liver

Visceral Surface



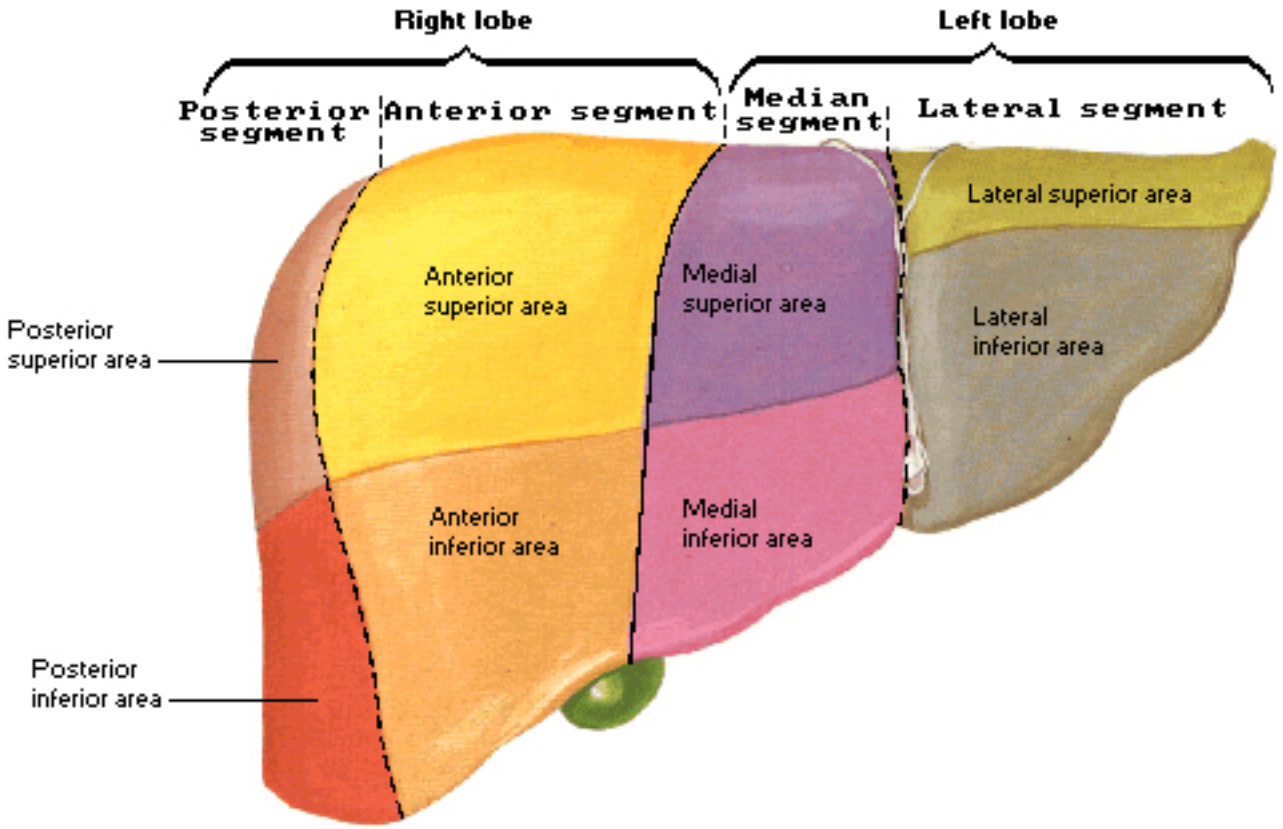
Surfaces and Bed of Liver

Visceral Surface



Liver Segments and Lobules

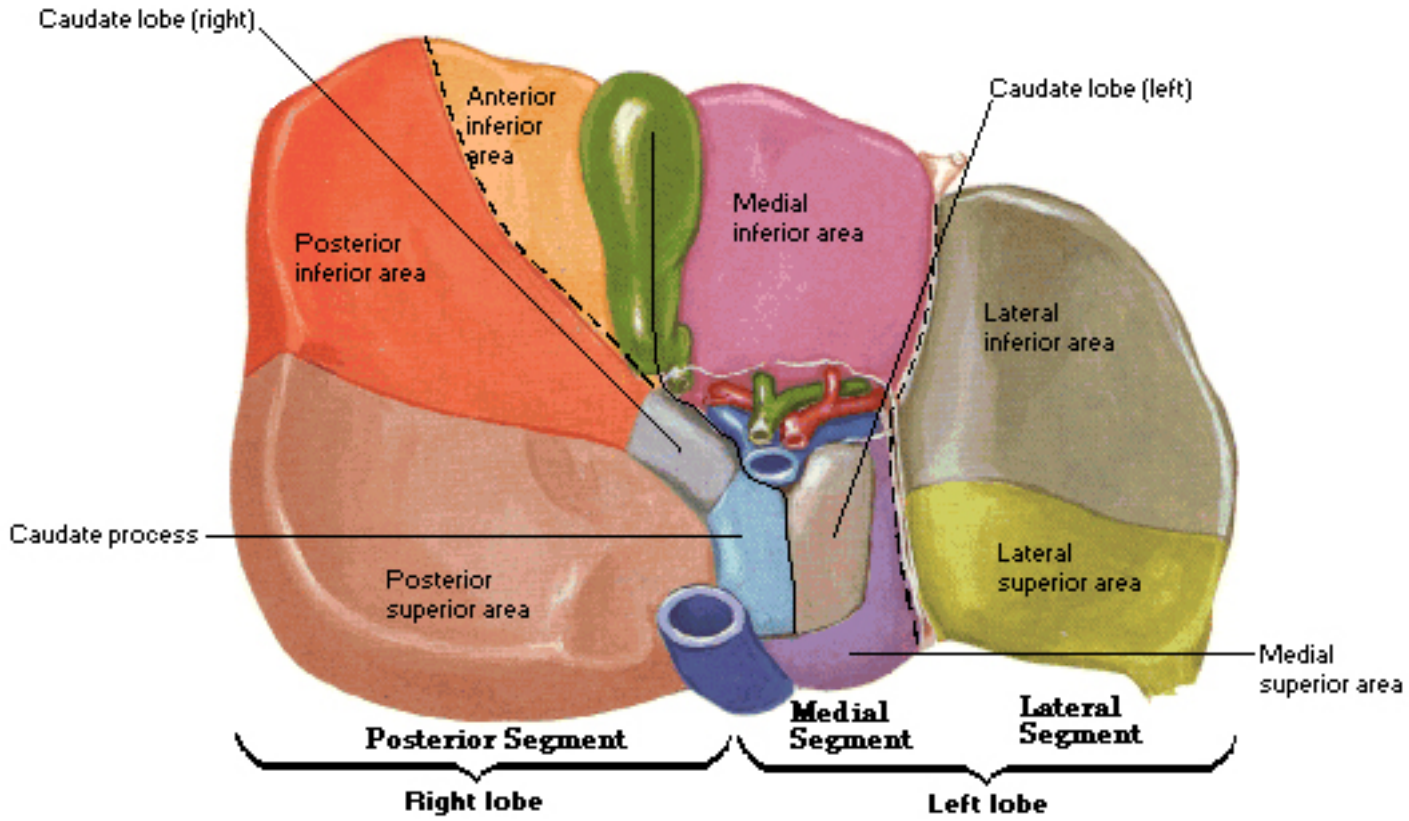
Parietal Surface



Division into segments is based upon ramifications of bile ducts and hepatic vessels. It does not entirely correspond with division into lobes

Liver Segments and Lobules

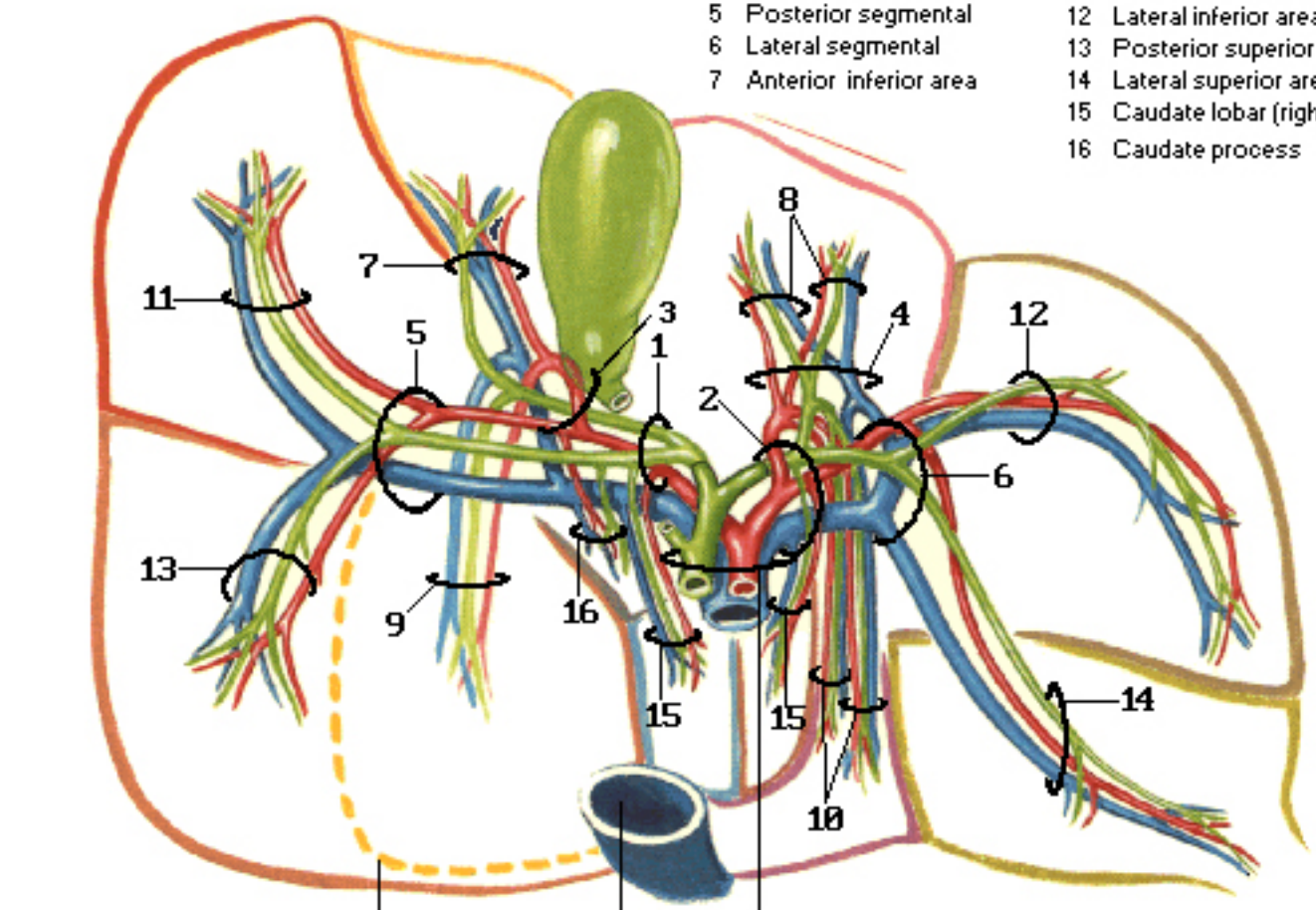
Visceral Surface



Division into segments is based upon ramifications of bile ducts and hepatic vessels. It does not entirely correspond with division into lobes

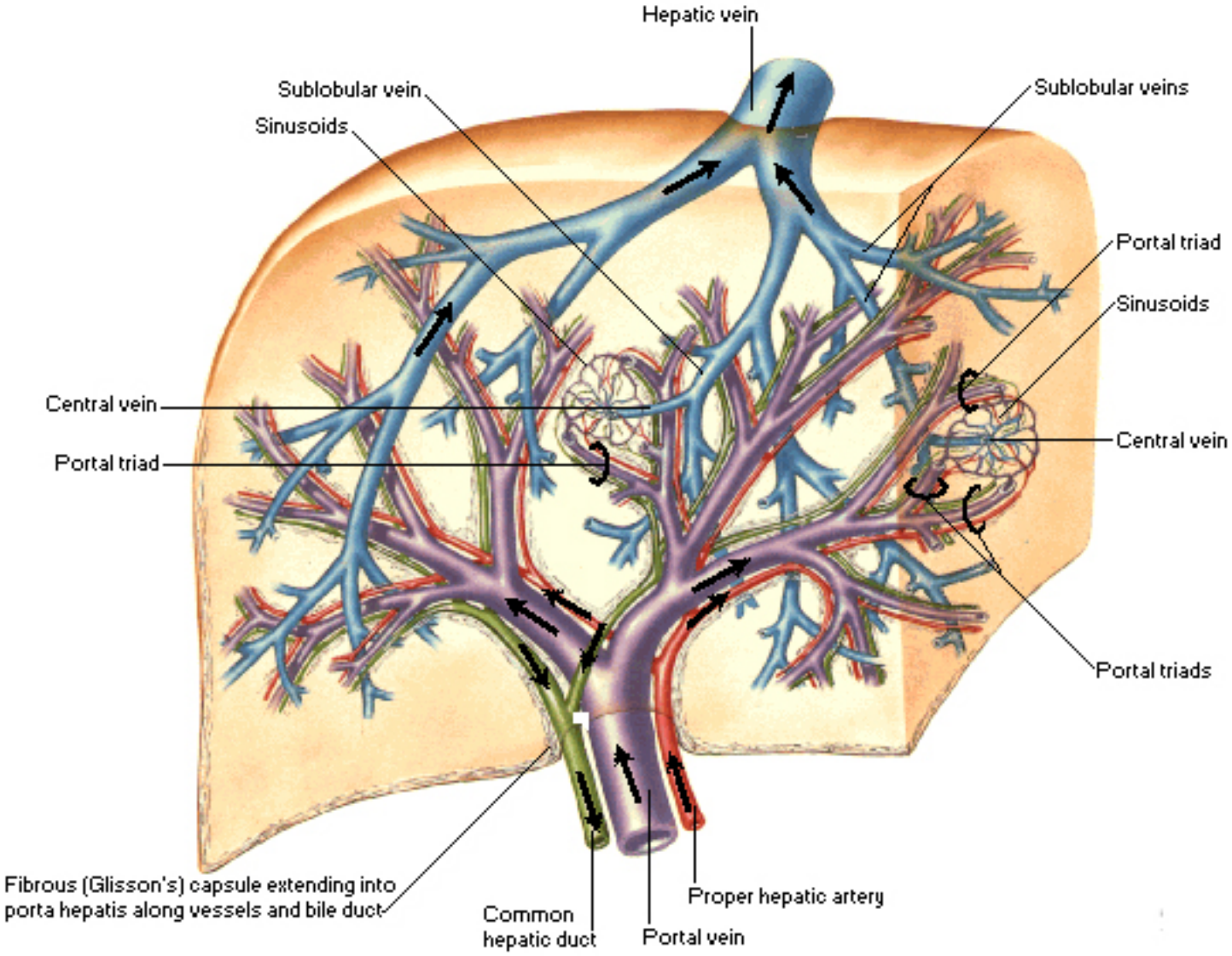
Distribution of Vessels and Ducts of Liver

1 Right lobar
2 Left lobar
3 Anterior segmental
4 Medial segmental
5 Posterior segmental
6 Lateral segmental
7 Anterior inferior area
8 Medial inferior area
9 Anterior superior area
10 Medial superior area
11 Posterior inferior area
12 Lateral inferior area
13 Posterior superior area
14 Lateral superior area
15 Caudate lobar (right and left)
16 Caudate process

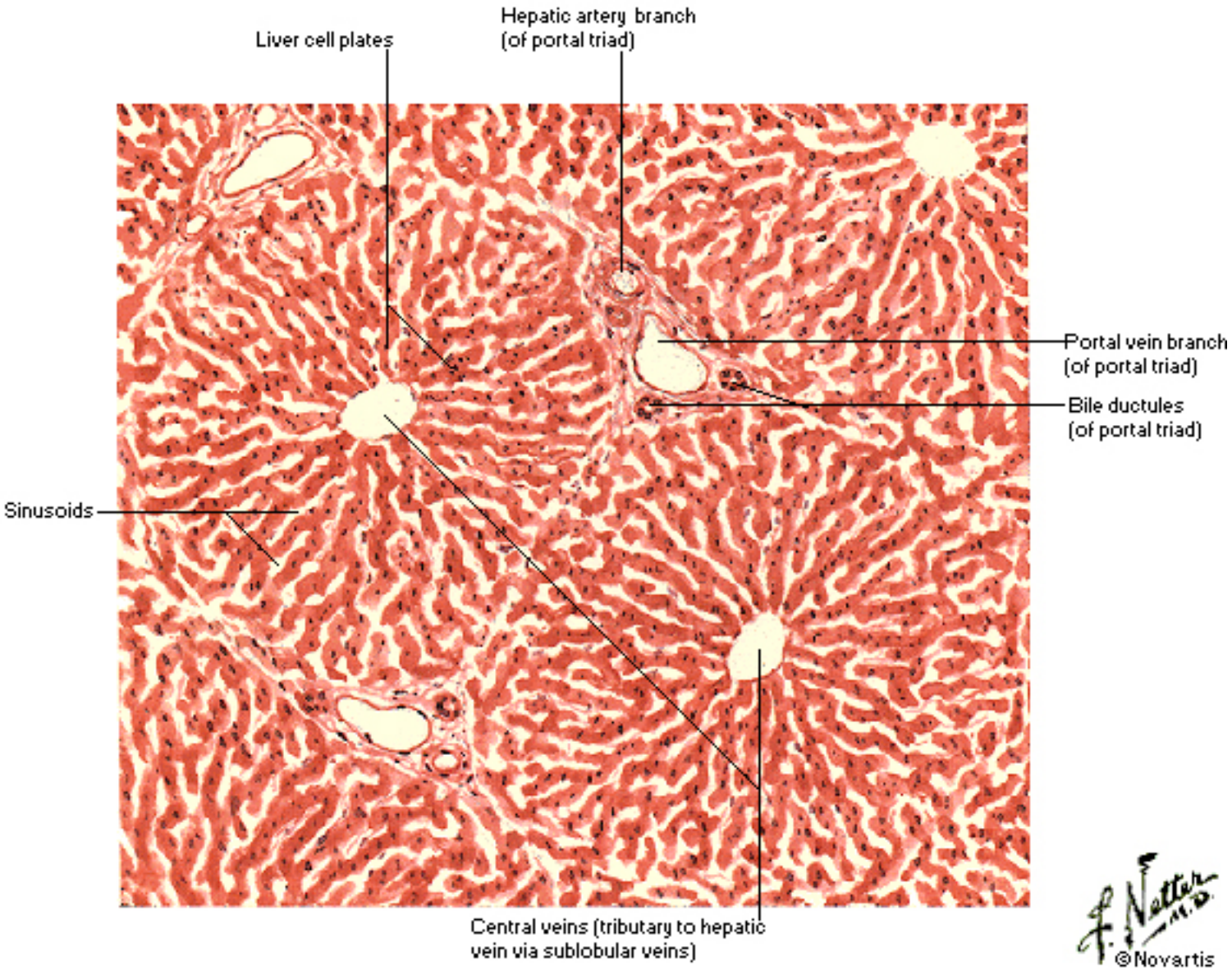


Intrahepatic Vascular and Duct Systems

Schema

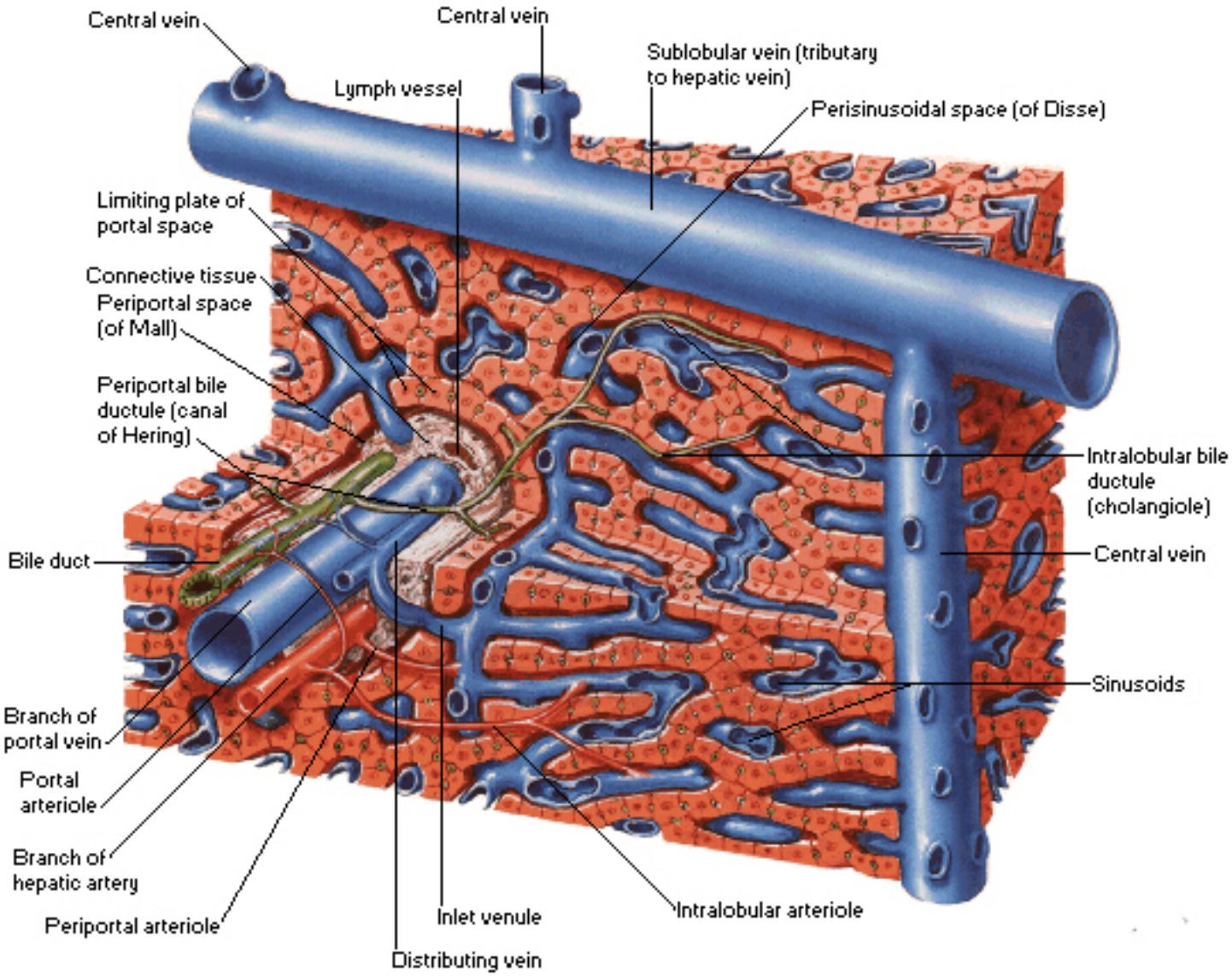


Normal Lobular Pattern of Liver



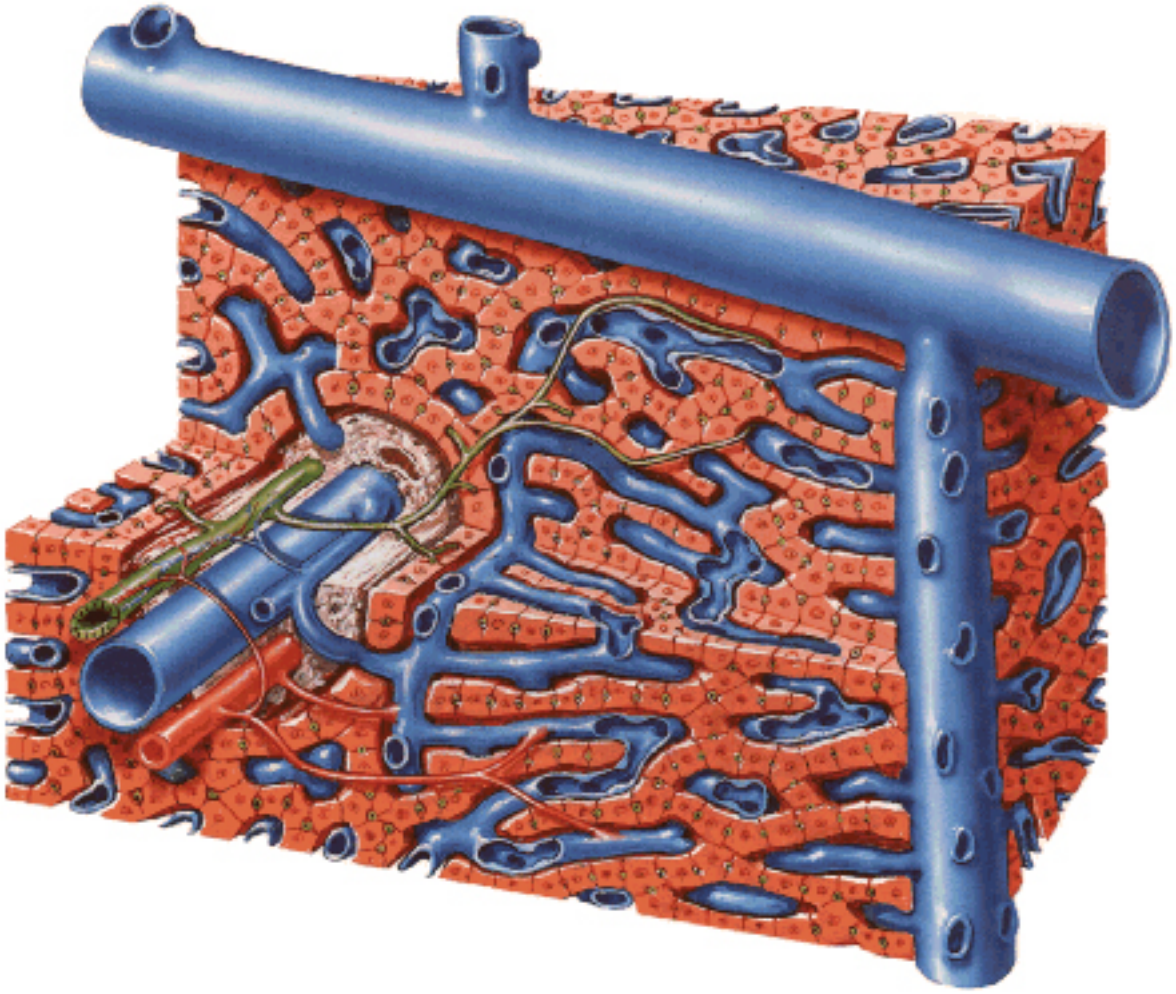
Liver Structure

Schema



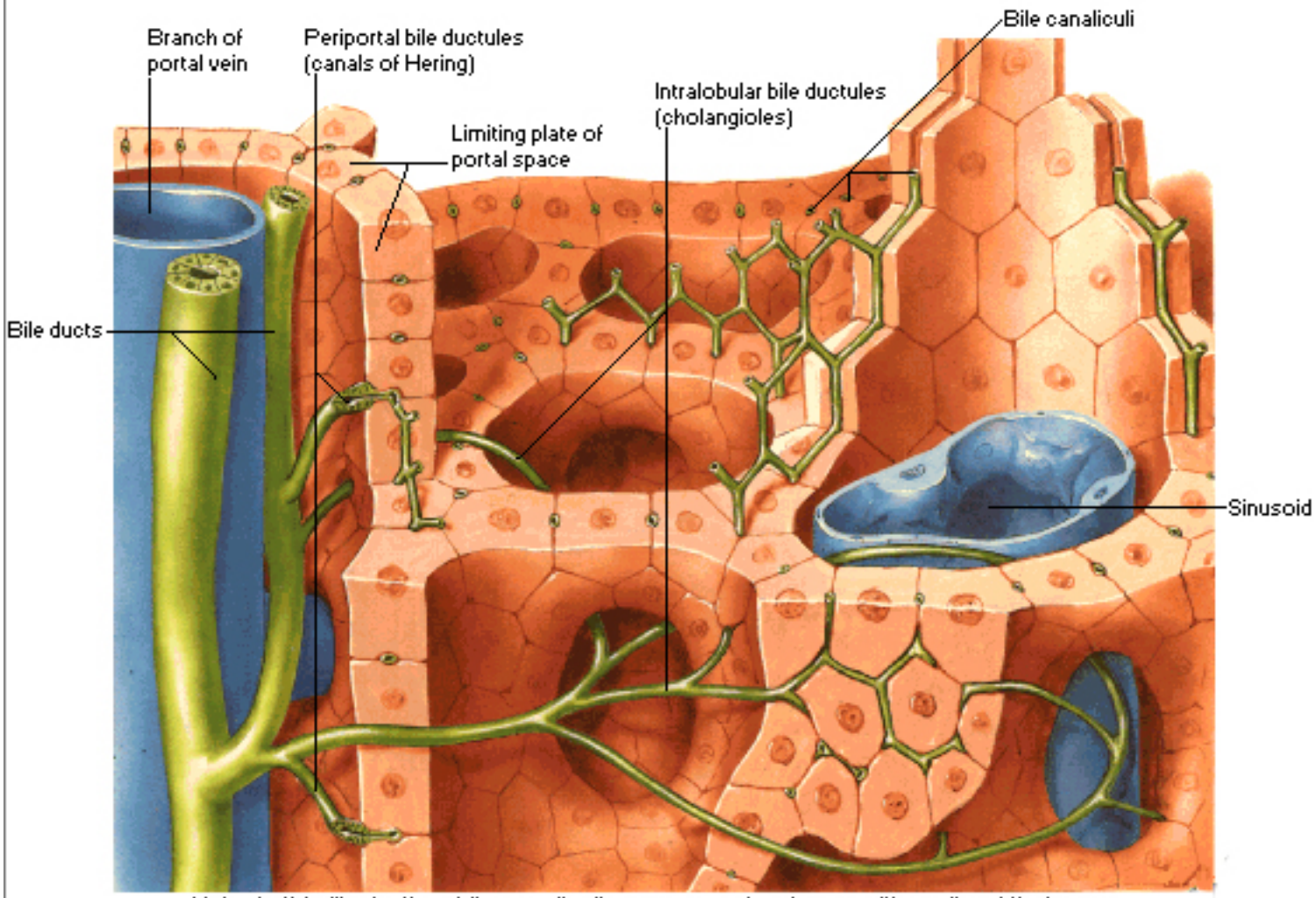
Liver Structure

Schema



Intrahepatic Biliary System

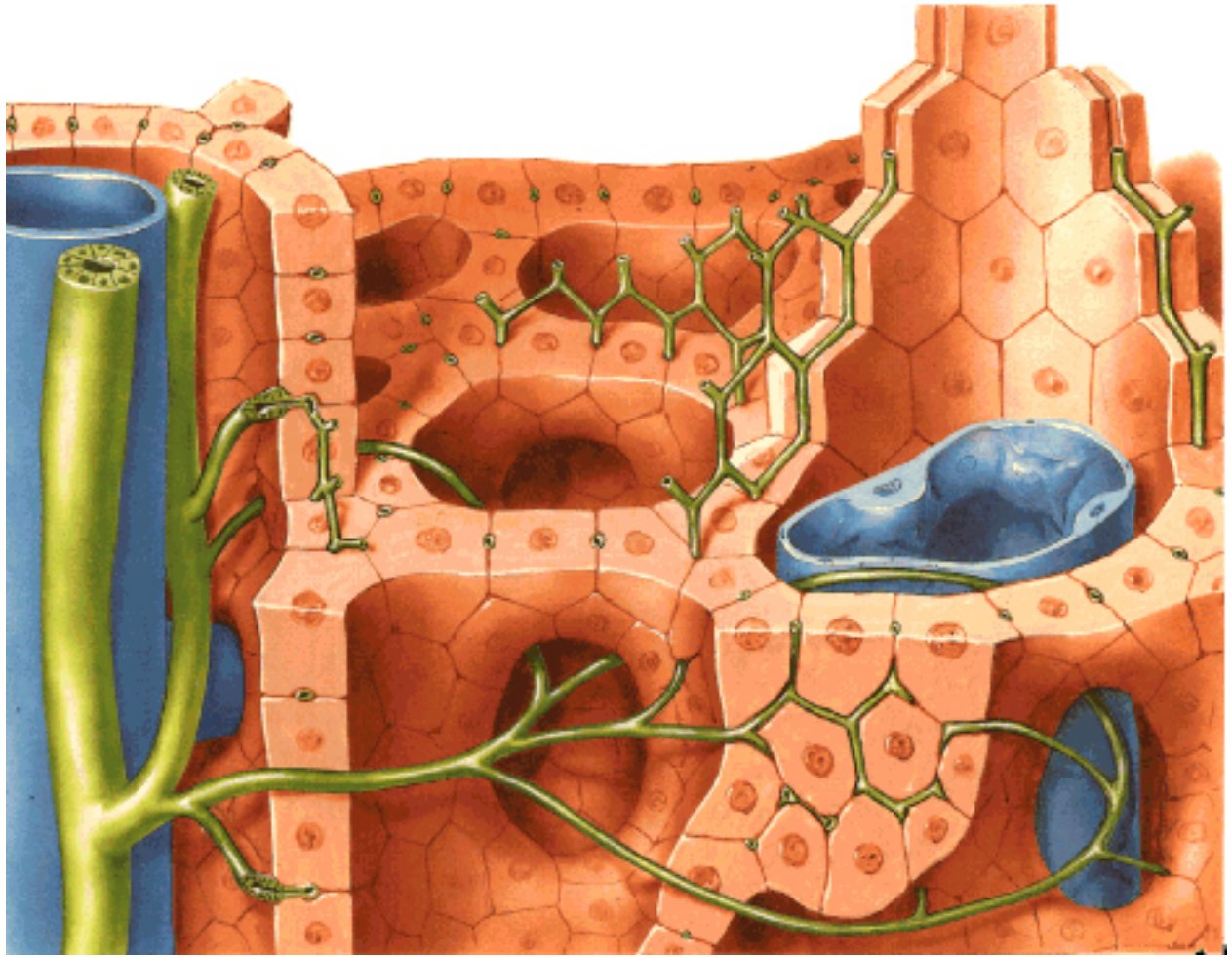
Schema



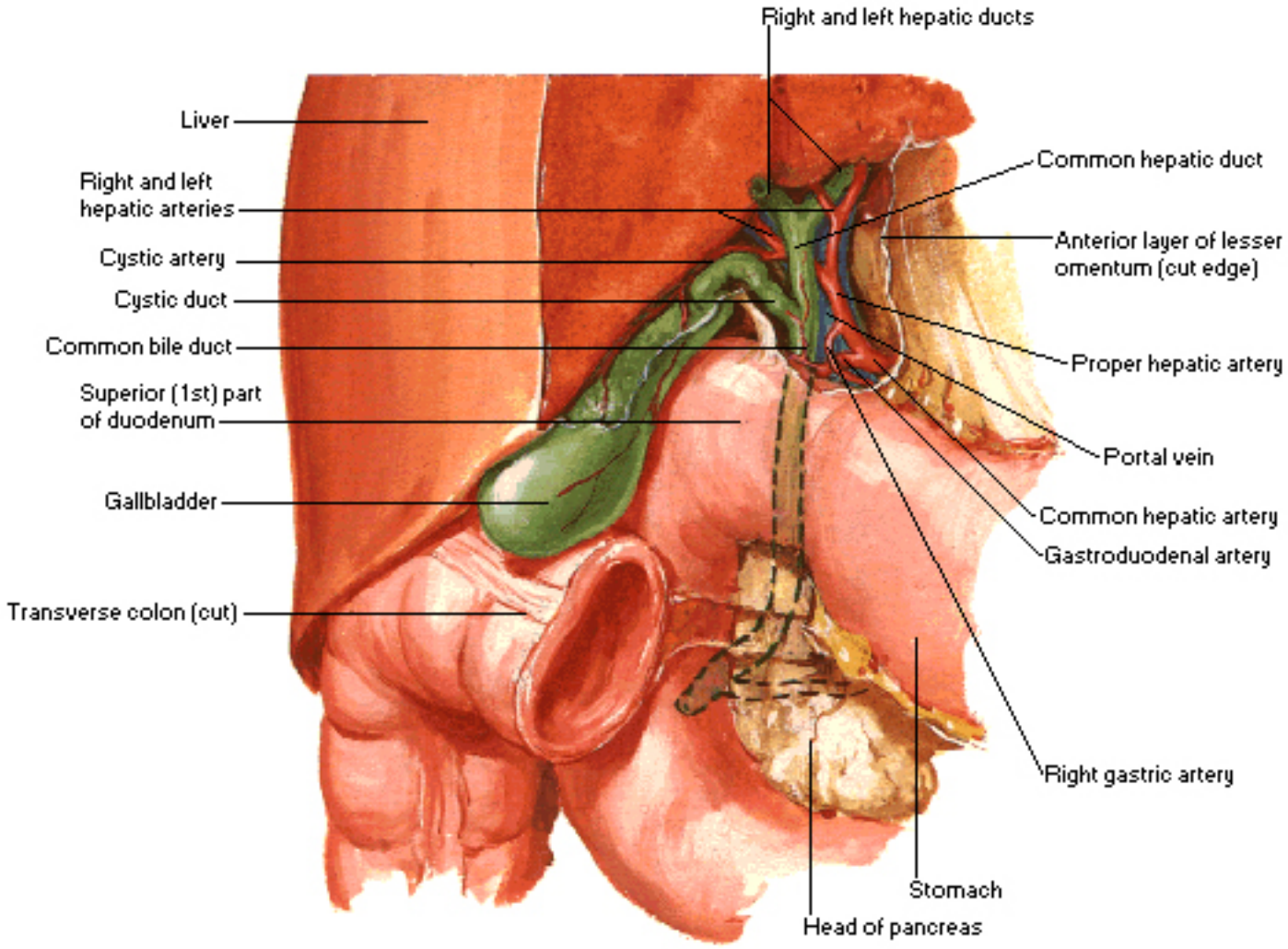
Note: in this illustration, bile canaliculi appear as structures with walls of their own. However, as shown in image 275B, boundaries of canaliculi are actually a specialization of surface membranes of adjoining liver parenchymal cells

Intrahepatic Biliary System

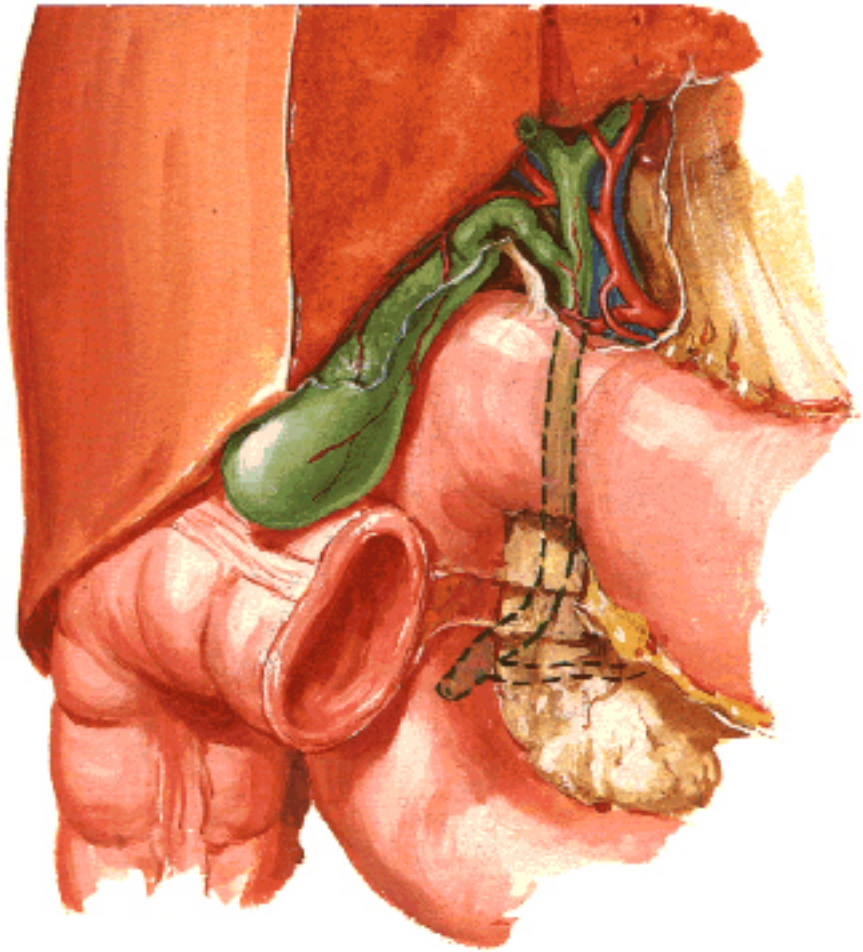
Schema



Gallbladder and Extrahepatic Bile Ducts

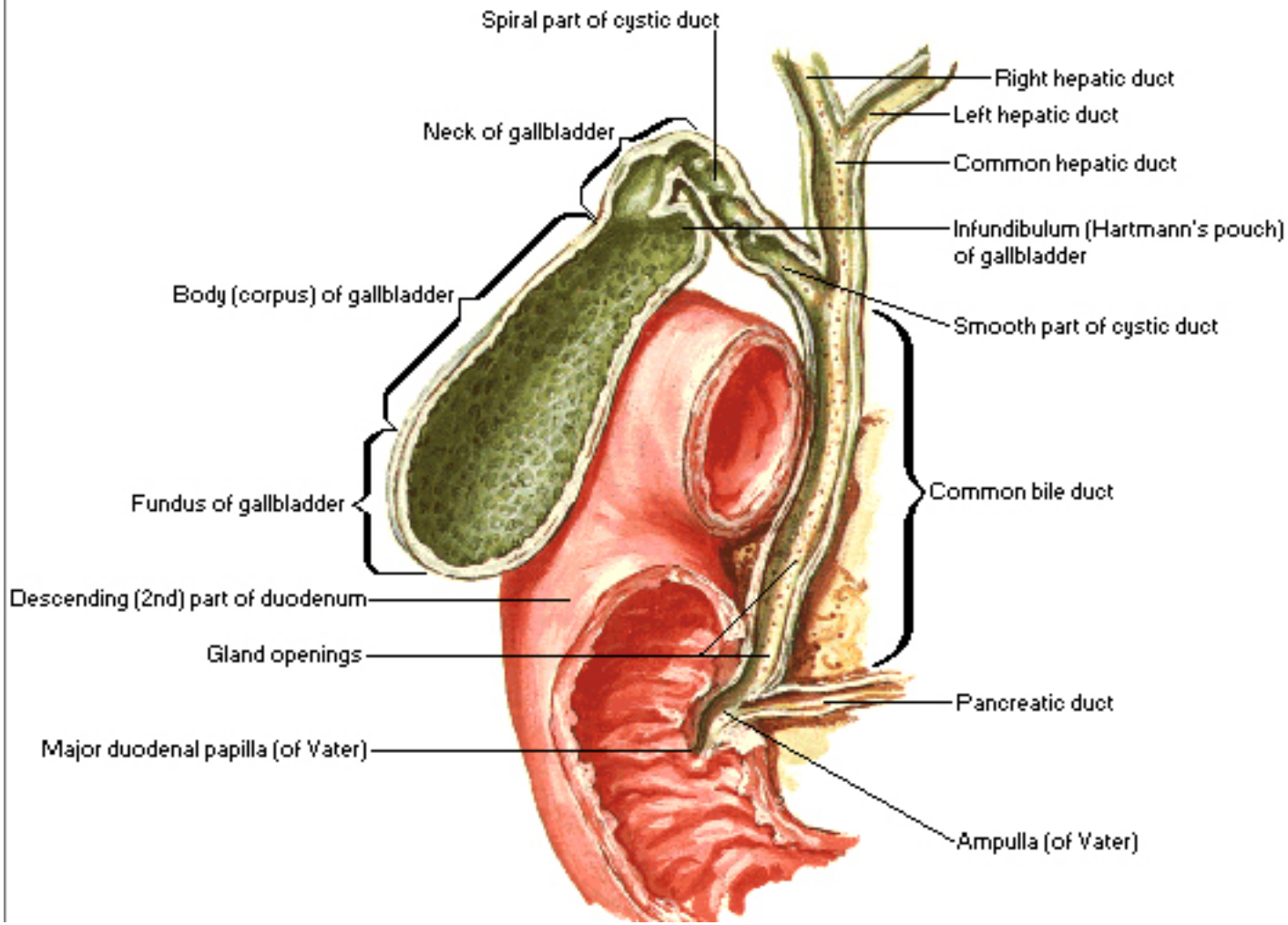


Gallbladder and Extrahepatic Bile Ducts

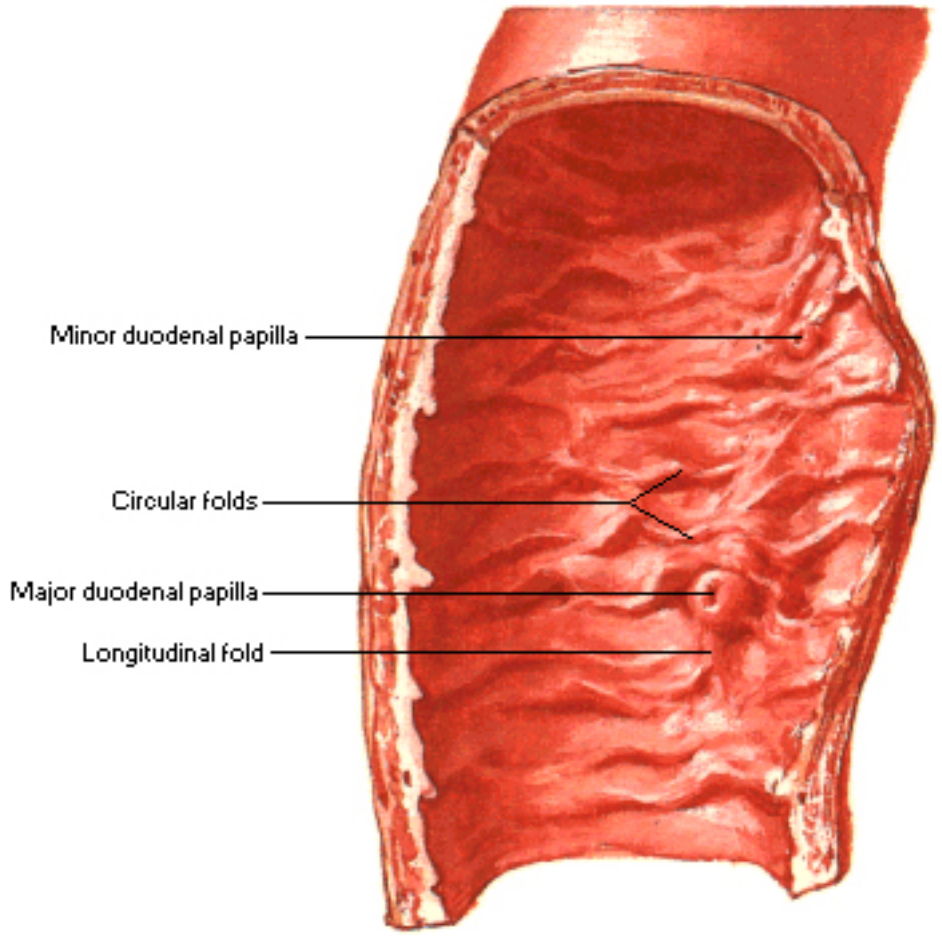


Gallbladder and Extrahepatic Bile Ducts

Sectioned



Choledochoduodenal Junction



Interior of descending (2nd) part of duodenum

Choledochoduodenal Junction

Dissection