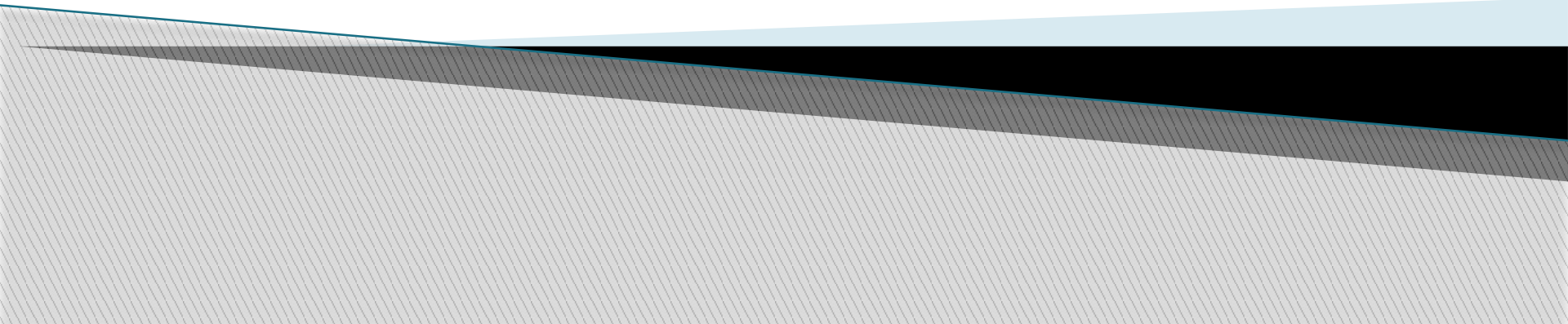
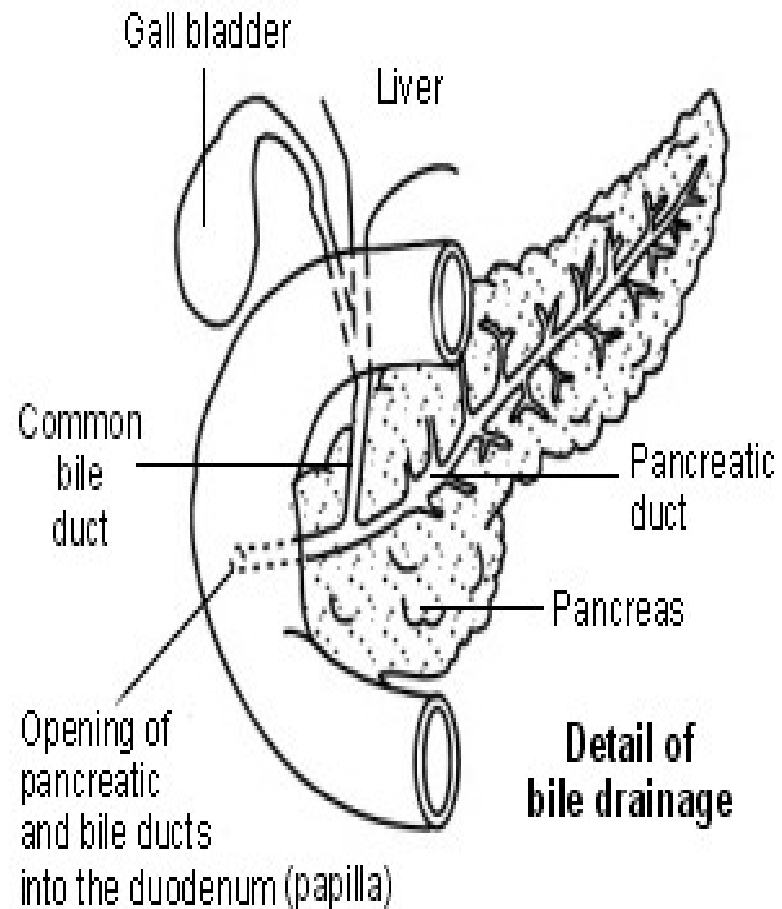
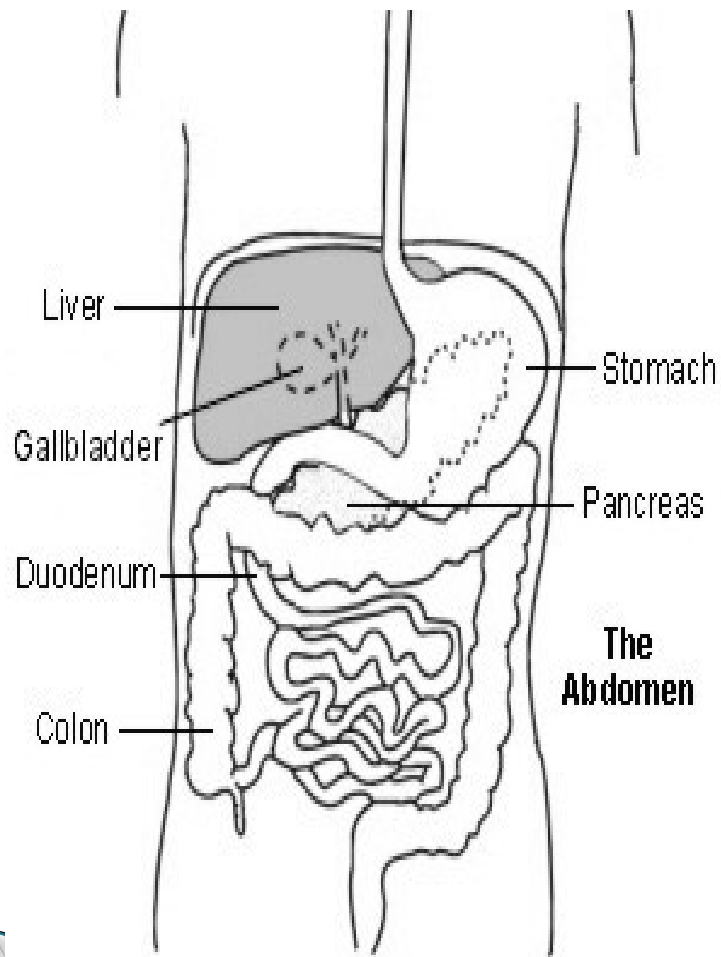
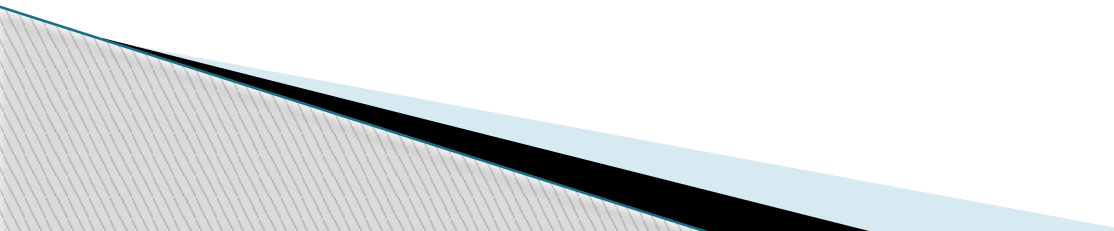


Liver functions test





- ▶ Measurement of various chemicals in blood made by the liver.
 - ▶ Indications to perform LFT:
 1. Help to diagnose liver disorders.
 2. Monitor activity of the disease
 3. Routine precaution when starting certain medicine; eg: antineoplastic agents.
 4. Screening for any potential diseases.
- 

WHAT ITEMS TO BE TESTED???

A - Enzymes :

Mainly used to diagnose liver disease
any injury to the liver result in cytolysis &
necrosis causes liberation of enzymes.
Extent of liver damage is determined by
serum level of these enzymes.

WHAT ITEMS TO BE TESTED???

Transaminases; AST/ SGOT. aspartate aminotransferase, serum glutamic oxaloacetic transaminase.

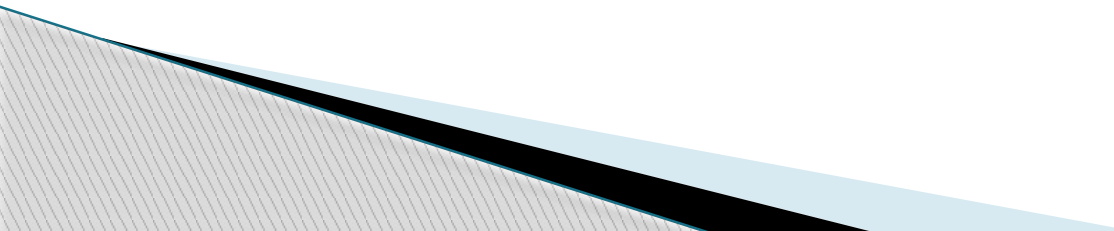
ALT/SGPT. Alanine aminotransferase, serum glutamic pyruvic transaminase.

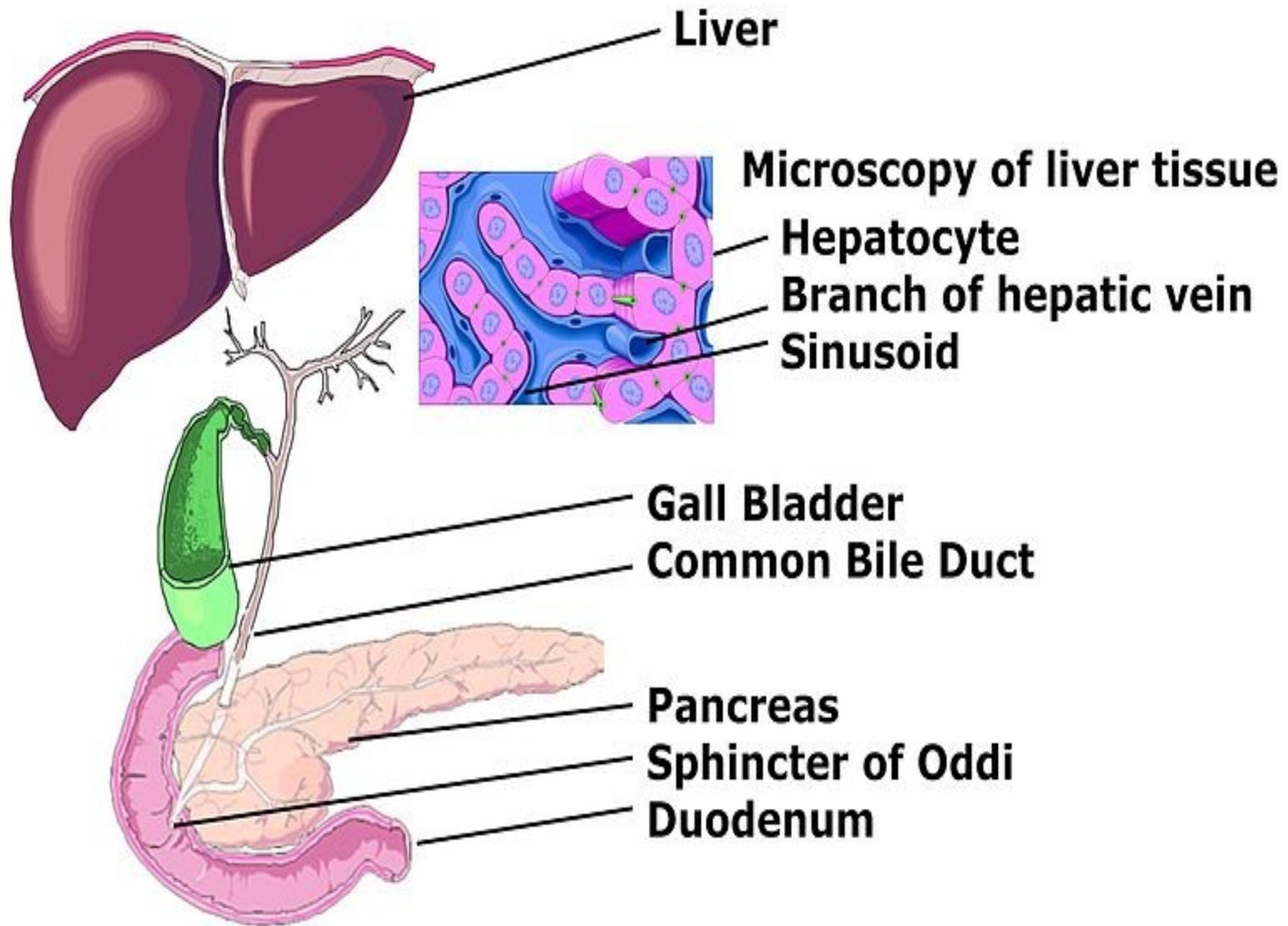
ALP, Alkaline phosphatase.

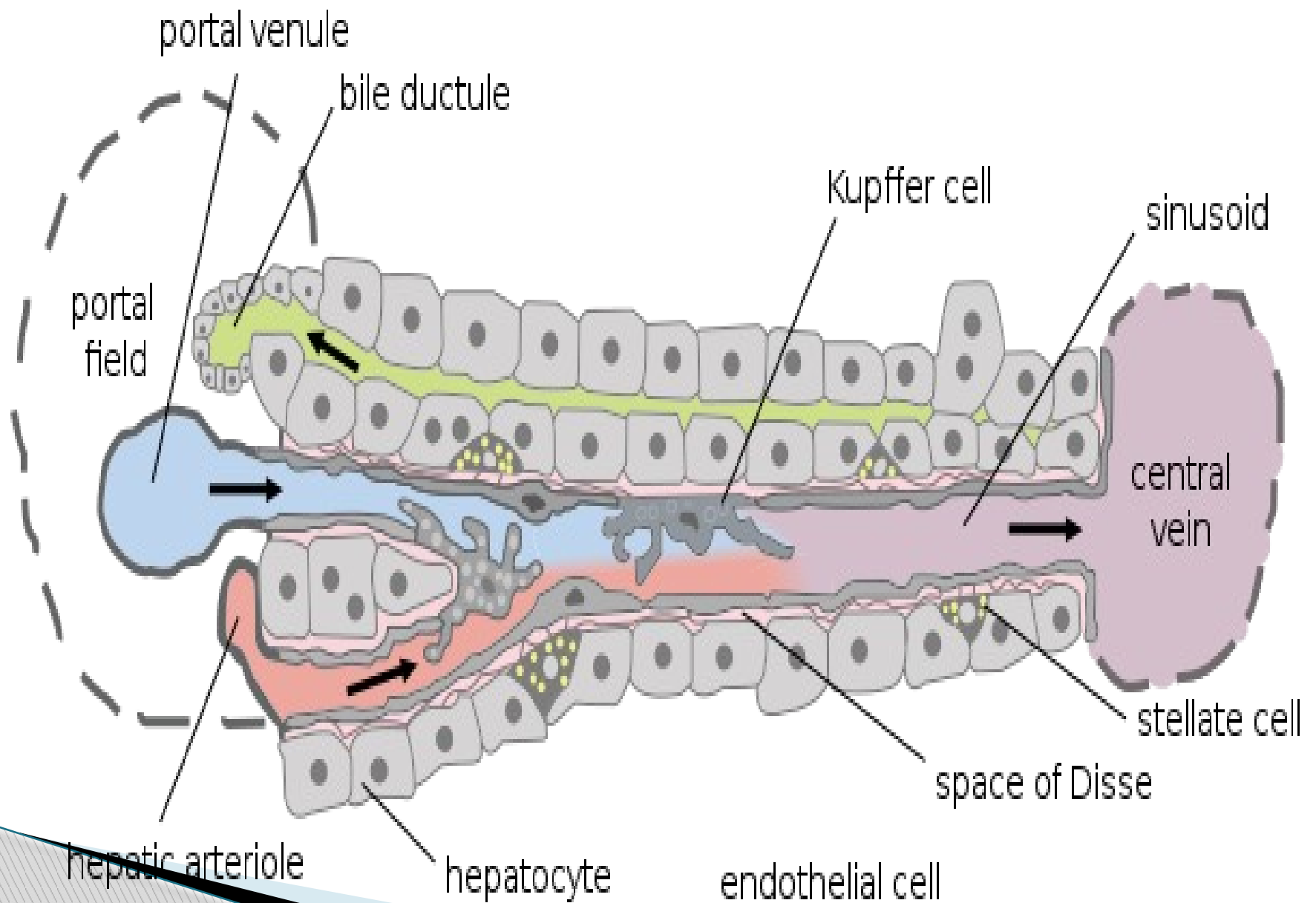
5`-nucleotidase (5NT).

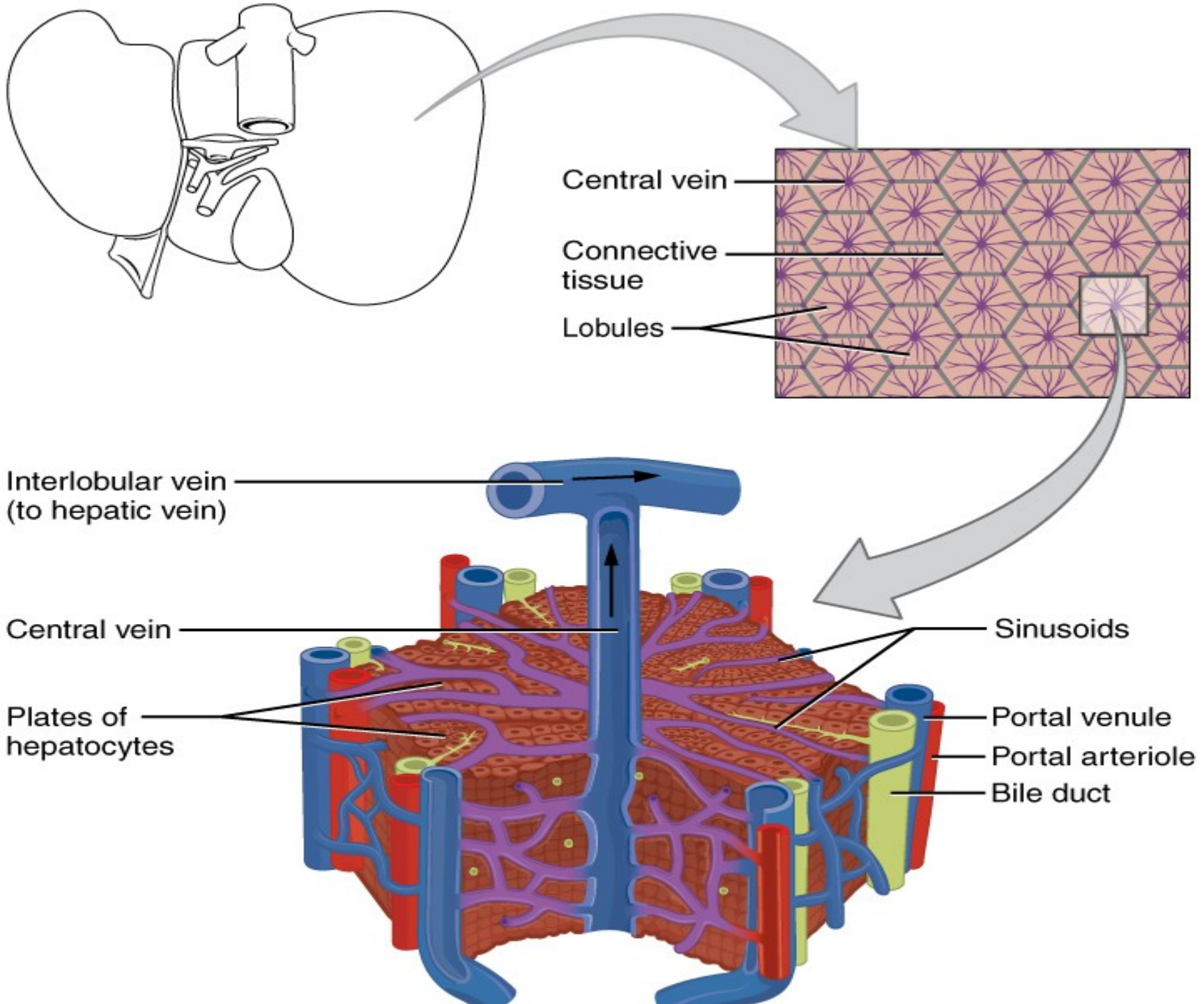
Gamma glutamyl transferase, GGT,.

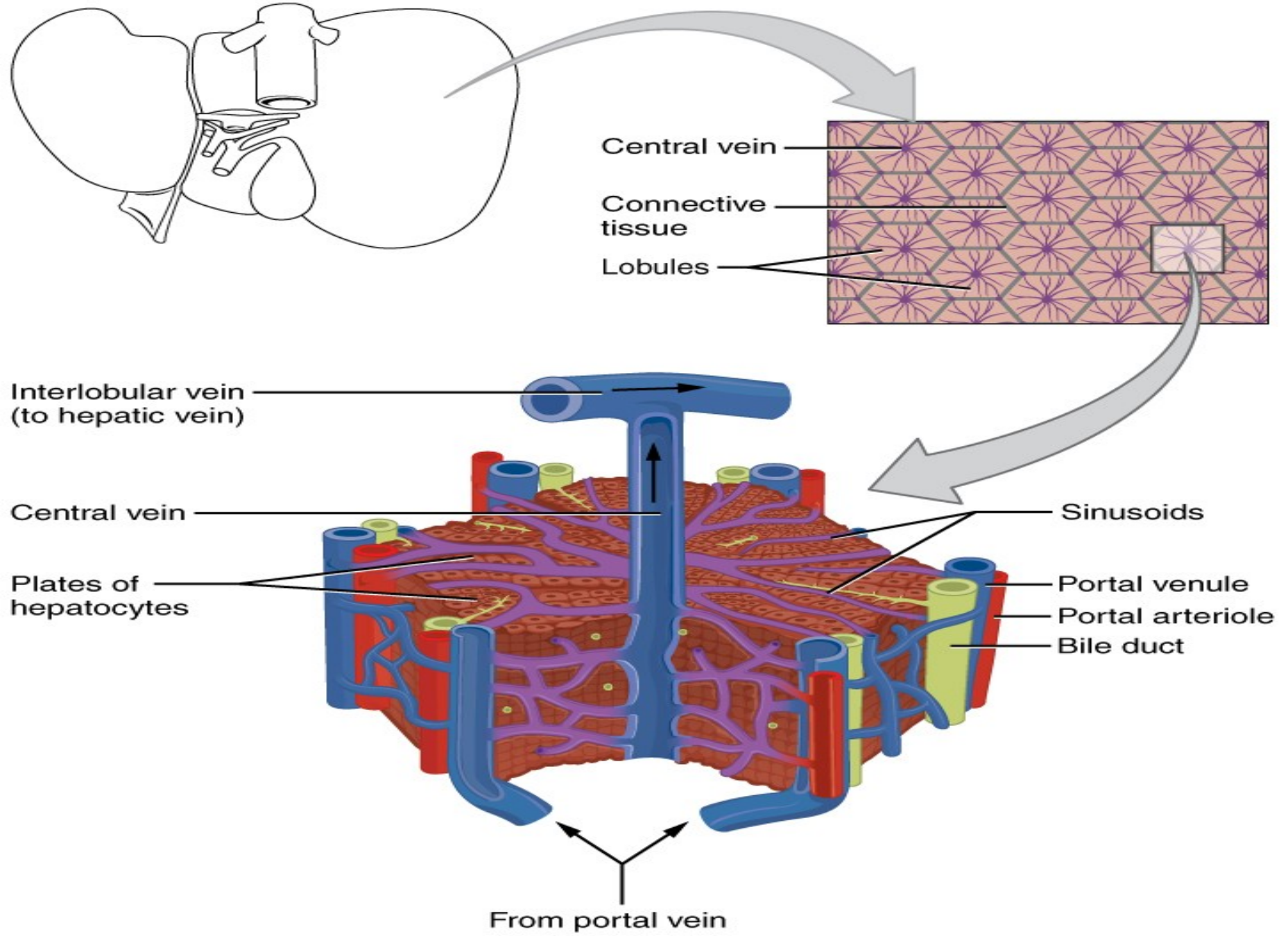
Cont:

- ▶ LDH, lactate dehydrogenase.
 - ▶ Transaminases;
 - ▶ AST, is found in all tissues;(heart, muscles, liver, RBCs) ie non tissue specific.
 - ▶ ALT, primarily present in liver, so it is more liver specific, ie of more diagnostic value.
 - ▶ Care should be taken in interpreting results of these enzymes.
- 

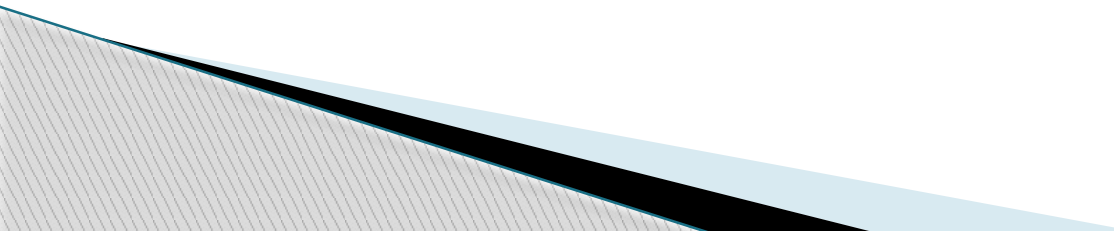




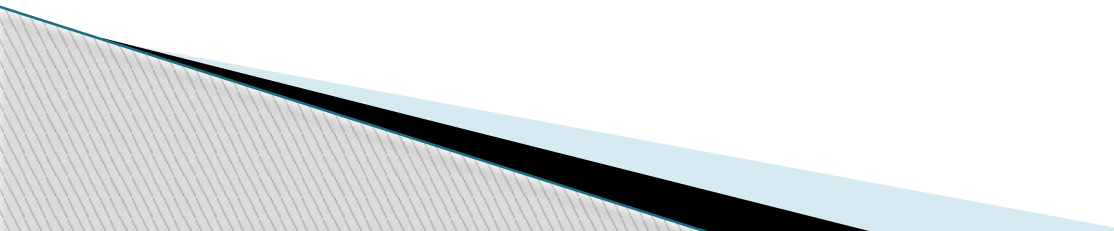




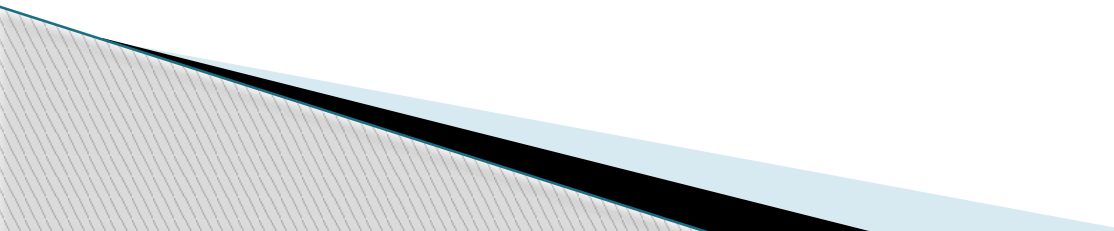
Cont;

- ▶ Examples:
 - ▶ Sudden reduction in transaminases..means???
 - ▶ Gradual reduction in transaminases...means??
 - ▶ ALP; tissue sources: l
 - ▶ Liver in both sinusoidal and bile canalicular membranes, intestine, bone , spleen ,placenta , RBCs, kidney.
 - ▶ Physiological rise in children.
 - ▶ Transient rise in ALP may occur in all types of liver diseases.
- 

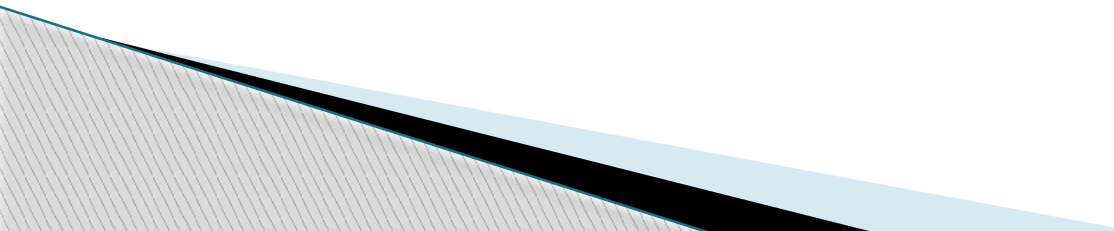
Cont,

- ▶ Specific causes to considered for ALP rise:
 - ▶ Highest elevation occur in extra-hepatic biliary obstruction.
 - ▶ Intra-hepatic cholestasis.
 - ▶ Primary biliary cirrhosis.
 - ▶ Metastatic liver lesions.
 - ▶ Bone disease, eg Paget disease.
- 

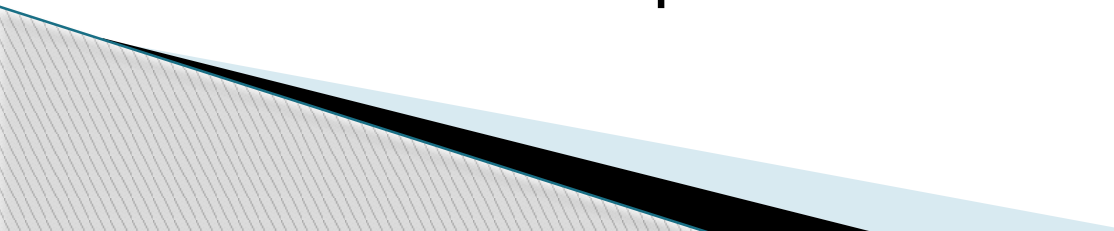
Cont;

- ▶ 5-Nucleotidase:
 - ▶ Rise occur in obstructive diseases.
 - ▶ Used to differentiate origin ALP source.
 - ▶ More sensitive to metastatic liver disease.
 - ▶ May rise after abdominal surgery.
 - ▶ Also in bone disease.
- 

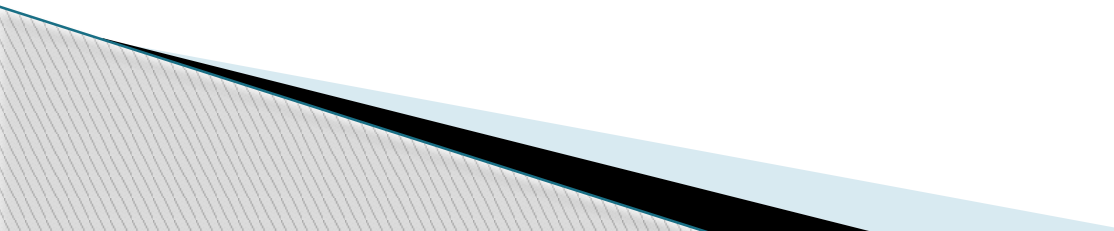
Cont;

- ▶ Gamma glutamyltransferase:
 - ▶ Tissue sources; liver and kidney.
 - ▶ Most sensitive to **ALCOHOL** consumption/ alcoholic liver disease.
 - ▶ Also rise can occur in biliary obstruction.
 - ▶ LDH: **NOT HELPFUL DIAGNOSTICALLY.**
- 

Tests measuring synthetic function:

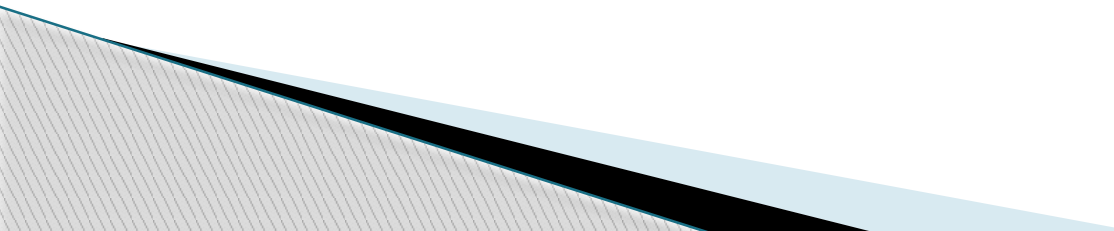
- ▶ Usually not sensitive to minimal liver damage, these tests are:
 - ▶ Albumin, alpha and beta globulins, and prothombin time.
 - ▶ Tests to nitrogen metabolism:
 - ▶ Liver plays a major role in removing ammonia from blood stream & converting it to urea,so ammonia & other toxins increase in liver failure that lead to what is known as hepatic coma.
- 

Cont:

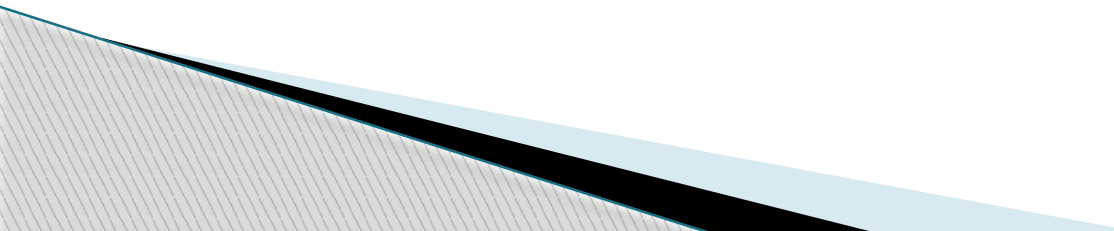
- ▶ Bilirubin, total; conjugated and unconjugated.
 - ▶ Blood ammonia level.
 - ▶ CSF glutamine (in hepatic encephalopathy, REYE`S syndrome.
 - ▶ Other tests: blood glucose, coagulation factors, ferritin
- 

Tumors of the liver

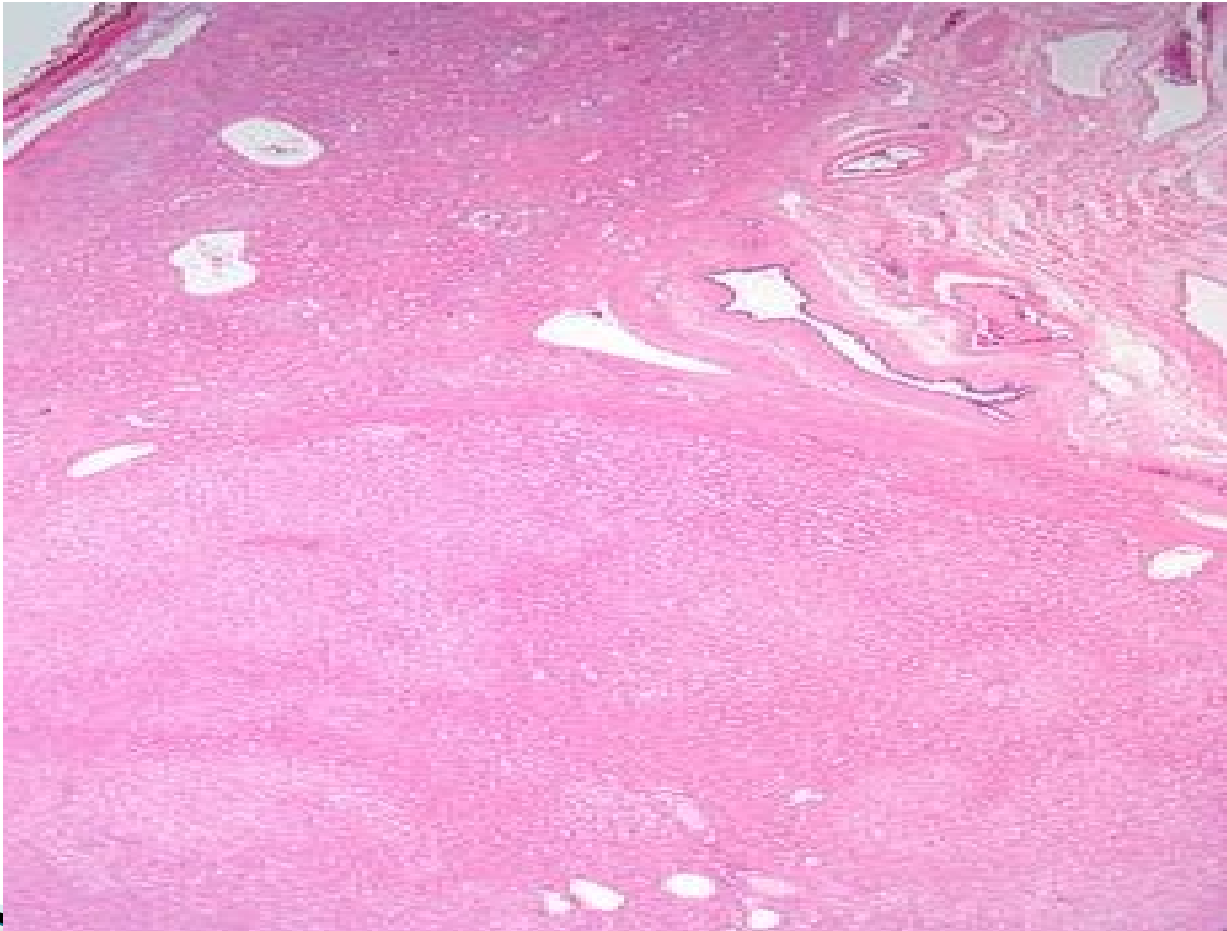
The background of the slide is black. A large, dark gray circle with a fine, concentric line pattern occupies the upper right portion of the frame. In the bottom left corner, there is a triangular shape with a blue-gray gradient and a fine, diagonal line pattern.

- ▶ The most common hepatic neoplasm are metastatic carcinomas, from colon, breast, lungs)
 - ▶ As other organs ;liver is site benign & malignant neoplasm:
 - ▶ Primary hepatic malignancies are;
 - ▶ Hepatocellular carcinoma (hepatoma).
 - ▶ Hepatoblastoma (of childhood).
 - ▶ Angiosarcoma (of blood vessels).
- 

Cont;

- ▶ Benign neoplasm;
 - ▶ Cavernous hemangioma: well circumscribed small soft nodules, beneath the capsule, consist of endothelial cell-lined vascular channels plus intervening stroma.
 - ▶ Incidental U/S ,chief significance is not to be mistaken as secondary.
 - ▶ Biopsy could lead to fatal intrapritoneal bleeding.
- 

Adenoma

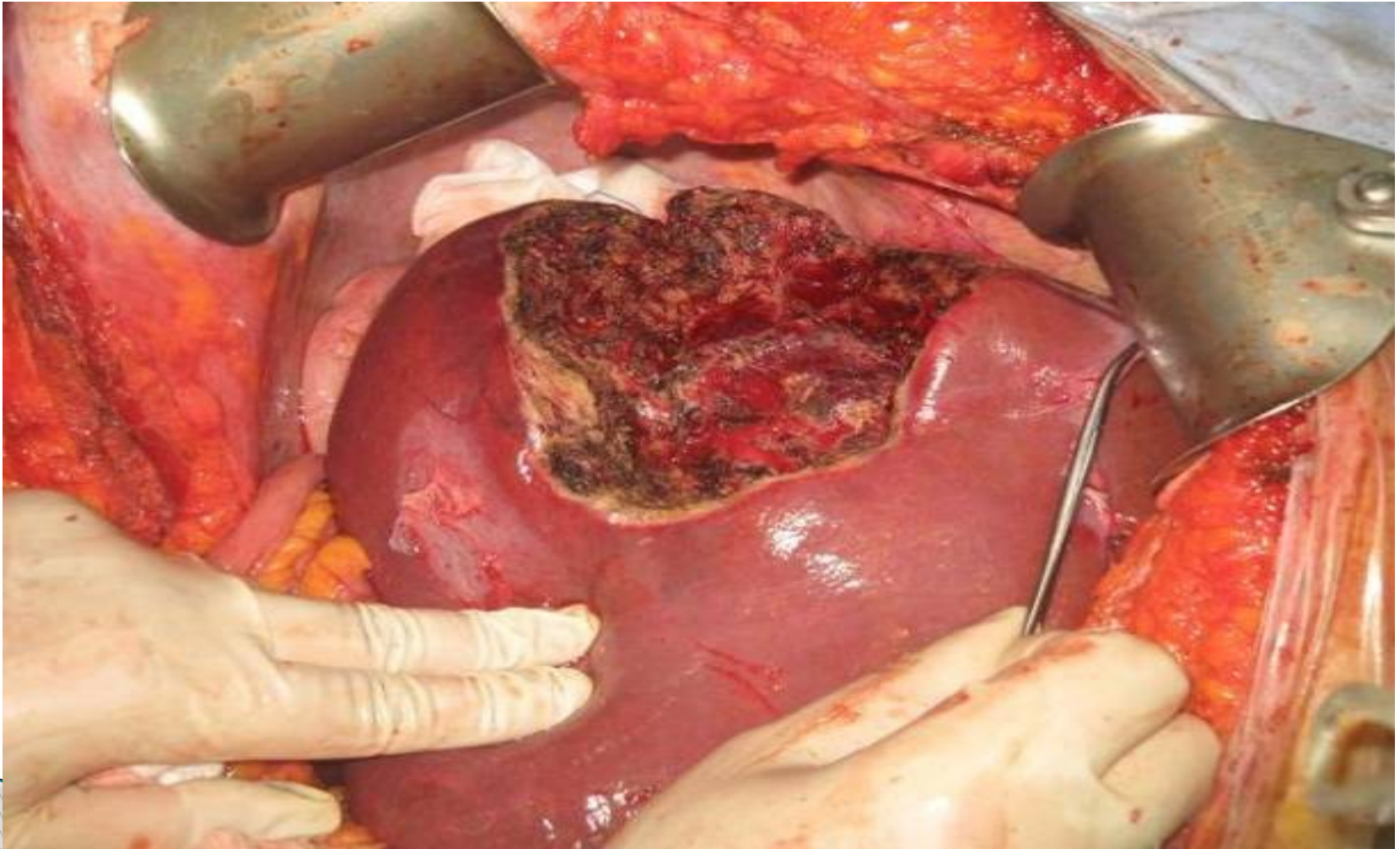


Liver Hemangioma

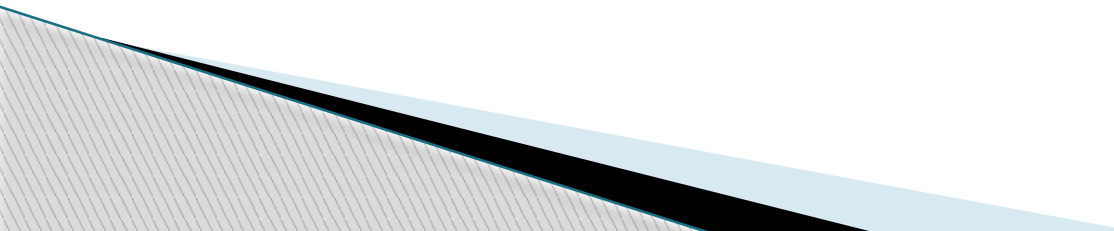


"Restricted Use. Source: FESP; University of Alabama at Birmingham, Department of Pathology"

Liver hemangioma



Cont;

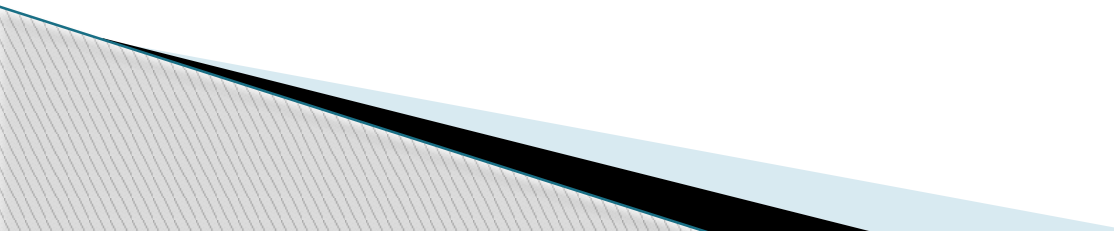
- ▶ Von Meyenburg complex; a congenital bile duct hamartomas, no malignant potential.
 - ▶ Focal nodular hyperplasia, simply it is a sort of increased blood flow through acquired or congenital vascular anomaly, can occur in women in reproductive age+/_ use contraceptive pills
 - ▶ Can be asymptomatic, or causing pressure symptoms.
- 

Cont;

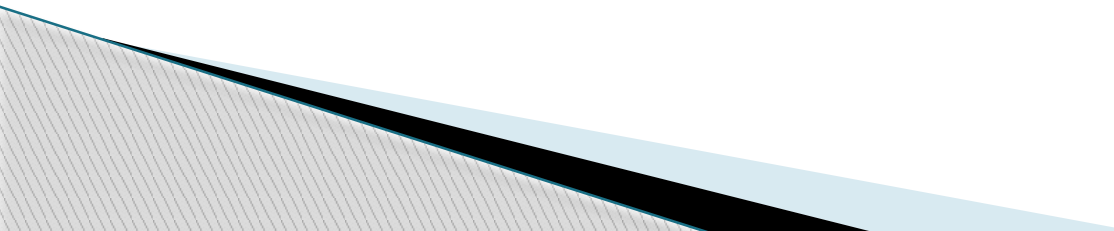
- ▶ Hepatic adenoma;
- ▶ Occur with use of use contraceptive pills,
 - 1- if intrahepatic ; mistaken as HCC.
 - 2-subcapsular ones are at risk of rupture.
 - 3- malignant transformation unusual, associated with beta- canten mutation.

Hepatocellular carcinoma

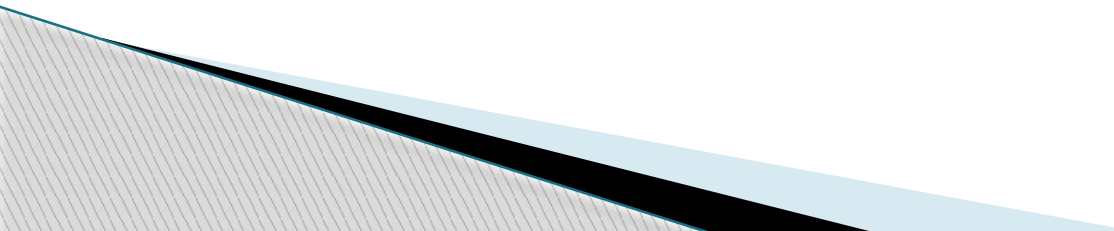
HCC

- ▶ Etiologic associations
 - ▶ Commonly preceded by chronic liver disease that lead to cirrhosis; eg
 - ▶ Viral hepatitis.
 - ▶ Alcoholic liver disease.
 - ▶ Metabolic disease(AAT deficiency, hemochromatosis).
 - ▶ Liver cirrhosis by itself is premalignant.
- 

HCC cont;

- ▶ Afla toxin exposure.
 - ▶ Non alcoholic fatty liver disease.
 - ▶ pathogenesis: in chronic viral hepatitis, cellular dysplasia; if occur, it considered as premalignant lesions, they are two types of lesions; large and small cell changes, recognized by liver biopsy)
 - ▶ in most cases it develop from small-cell, high grade dysplastic nodules in cirrhotic liver.
- 

HCC cont;

- ▶ It also may arise from hepatocytes as well as progenitor cells, characterized by high genetic instability, and high tendency for vascular invasion.
 - ▶ Morphology can be:
 - ▶ Unifocal, multifocal, or diffusely infiltrative
- 



Clinical features:

- ▶ Silent hepatomegally.
- ▶ If developed from cirrhosis, there is sudden increase in liver size & worsening ascites.

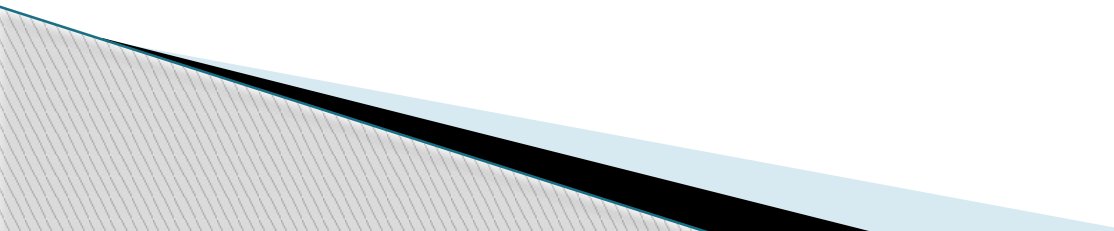
Diagnosis:

Symptoms & signs.

LFT

Tumor marker, Alfa-fetoprotein, positive only in 50% of tumors, it is not specific for HCC as it rise due to other causes (pregnancy, yolk sac tumors)

prognosis

- ▶ Bad
 - ▶ Resection, curative for single small lesion.
 - ▶ Transplantation can be curative,
 - ▶ Clinical trials using broad spectrum tyrosine kinase inhibitor.
 - ▶ HBV immunization programme reduce the incidence in endemic areas.
- 

THE END

THANK YOU

