

# Liver Disease

KOGATAM.LIVINGSTONE  
KOPULLA.VIJAY VARDHAN  
MOHAMMED.ABDUL SAQIB  
SHAIK NAYAB RAHMAN.SADHIK

# Alcoholic Liver Disease

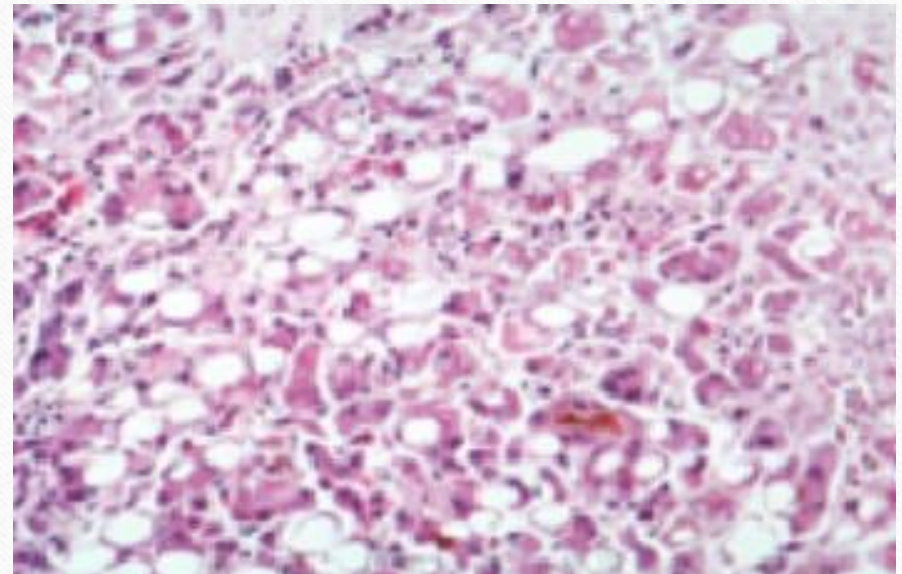
- Three ways alcohol (ethanol) can damage liver
  - #1: Alcoholic fatty liver disease
  - #2: Acute hepatitis
  - #3: Cirrhosis



# Alcoholic Fatty Liver Disease

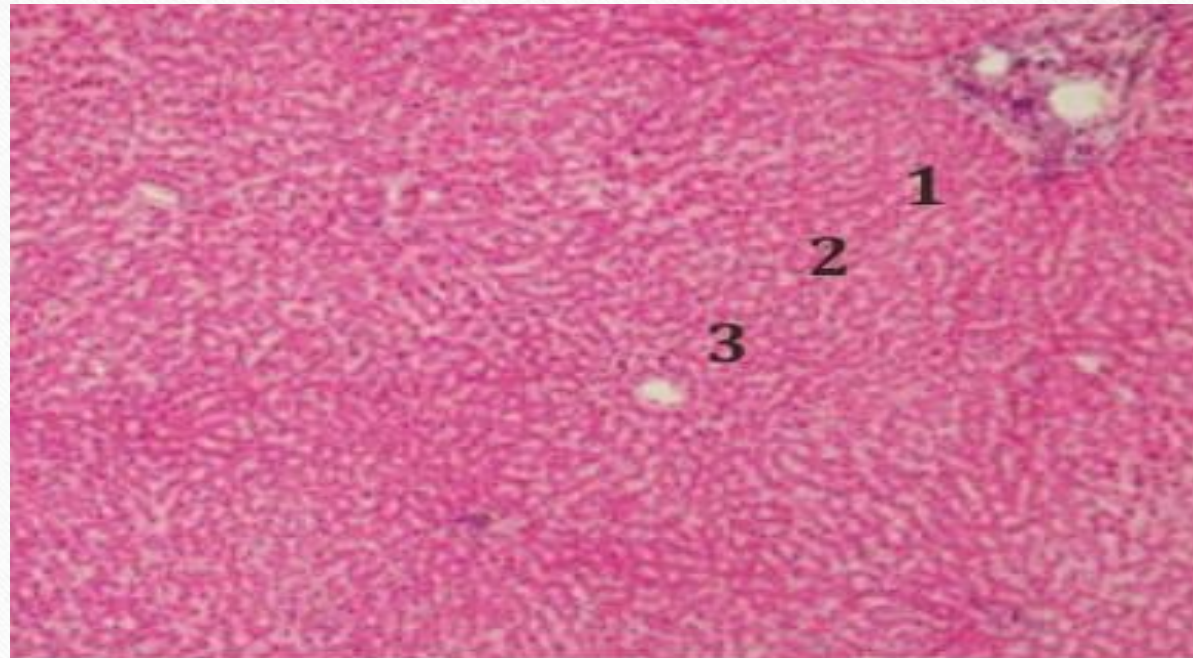
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- Accumulation of **fatty acids** (fatty infiltration of liver)
- Usually asymptomatic among heavy drinkers
- May cause hepatomegaly on exam
- Abnormal LFTs (**AST>ALT**)
- Often reversible with cessation of alcohol
- ↑ risk of cirrhosis



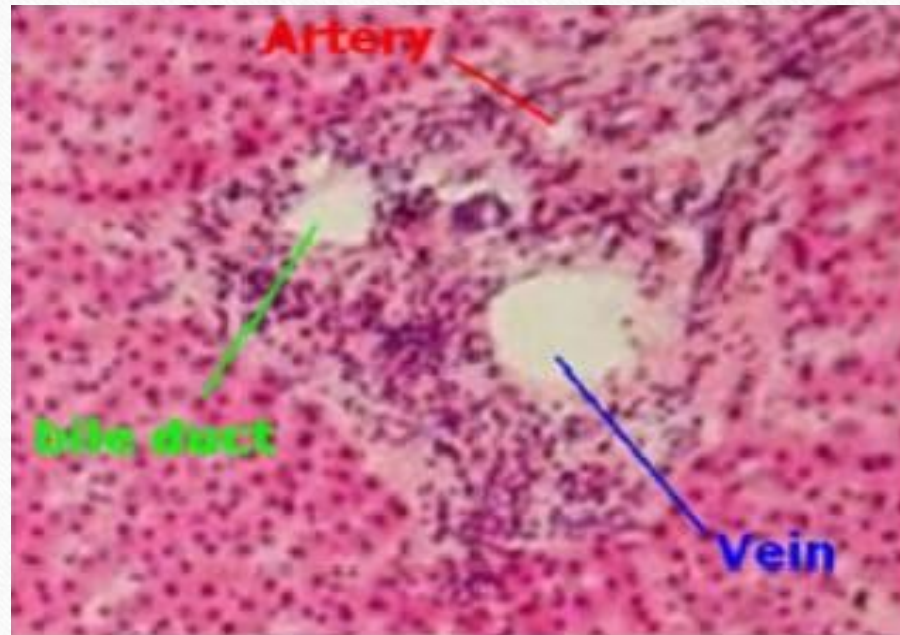
# Liver Lobules

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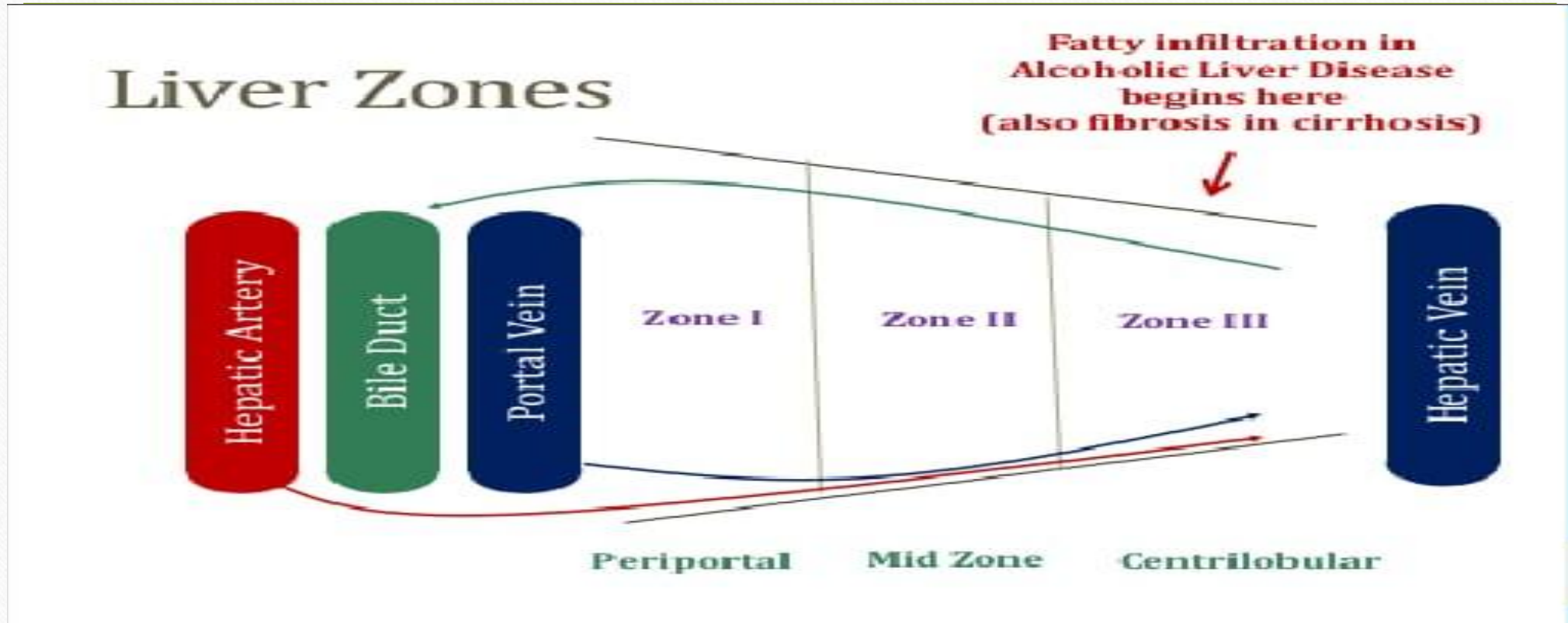


# Portal Triad

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# Liver Zones



# NAFLD

## Non-alcoholic Fatty Liver Disease

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- Fatty infiltration of liver not due to alcohol
  - NAFL: Fatty liver
  - NASH: Steatohepatitis (fat and inflammation)
- Often asymptomatic
- Abnormal LFTs (**ALT>AST**)
- May progress to cirrhosis
  - Associated with **obesity**
- May improve with weight loss

# Alcoholic Hepatitis

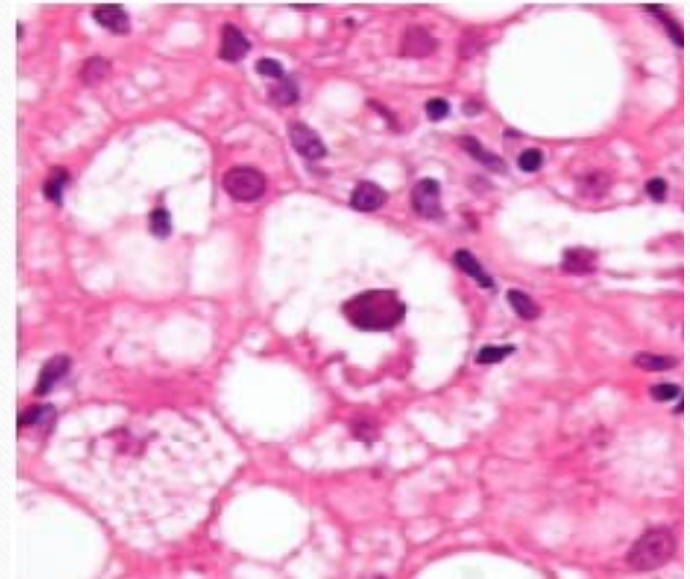
- Classically occurs after heavy, binge drinking on top of long history of alcohol consumption
- Toxic effects from **acetaldehyde**
- Symptoms
  - Fever
  - Jaundice
  - RUQ pain/tenderness





# Mallory bodies

- Classic histopathology finding alcoholic liver disease
- Cytoplasmic inclusions
- Damaged **intermediate filaments** in hepatocytes



# Budd Chiari Syndrome

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- Thrombosis of hepatic vein
- Abdominal pain, ascites, hepatomegaly
- **Zone 3** congestion, necrosis, hemorrhage
- Common causes:
  - Myeloproliferative disorder (P. vera, ET, CML)
  - Hepatocellular carcinoma
  - OCP/Pregnancy
  - Hypercoagulable states

# Right Heart Failure

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- “Cardiac cirrhosis”
- Rare cause of liver failure
- Chronic liver edema → cirrhosis
- Results in **nutmeg liver**
- Mottled liver like a nutmeg
- Also seen Budd Chiari



# Reye's Syndrome

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- Rare cause of liver failure and **encephalopathy**
- Children with viral infections who take aspirin
  - Classically chicken pox (**varicella zoster**) and influenza B
- Rapid, severe liver failure
  - Evidence that **aspirin inhibits beta oxidation**
  - Mitochondrial damage seen
  - Fatty changes in liver (hepatomegaly)
  - Vomiting, coma, death
- Avoid aspirin in children (except Kawasaki's)

# $\alpha$ 1 Anti-trypsin Deficiency

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- Inherited (autosomal **co-dominant**)
- Decreased or dysfunctional AAT
- AAT balances naturally occurring proteases



# $\alpha$ 1 Anti-trypsin Deficiency

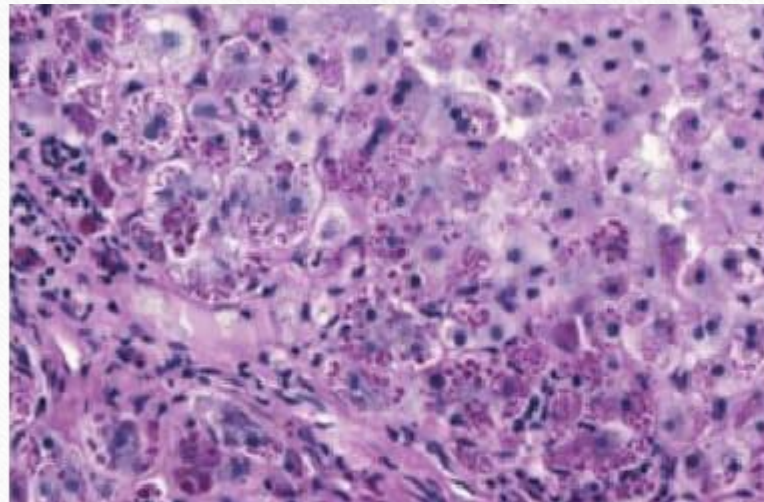
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- Lung
  - **Emphysema**
  - Imbalance between neutrophil elastase (destroys elastin) and elastase inhibitor AAT (protects elastin)
- Liver
  - **Cirrhosis**
  - Abnormal  $\alpha$ 1 builds up in liver (endoplasmic reticulum)
  - Pathologic polymerization of AAT
  - Occurs in endoplasmic reticulum of hepatocytes

# $\alpha$ 1 Anti-trypsin Deficiency

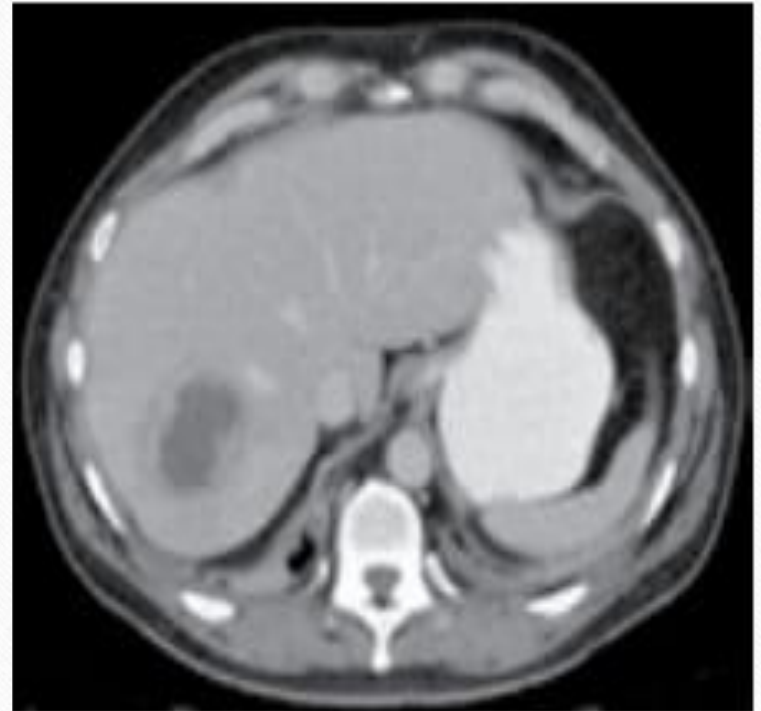
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- AAT polymers stain with **PAS**
- Resist **resist digestion by diastase** (unlike glycogen)



# Liver Abscess

- Walled-off infection of the liver
- In the US usually bacteria
  - Bacteremia
  - Cholangitis (GN Rods; Klebsiella often identified)
- **Entamoeba histolytica** (protozoa)
  - Cysts in contaminated water → bloody diarrhea (dysentery)
  - Ascends in the biliary tree
- **Echinococcus** (helminth)
  - Fecal-oral ingestion of eggs
  - Massive liver cysts





# Viral Hepatitis

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- Hepatitis A, B, C, D, or E
- Very high AST/ALT
  - Often  $>1000$  ( $>25x$  normal)
- Hyperbilirubinemia and jaundice
- If severe, may see abnormal synthetic function
  - Hypoglycemia, elevated PT/PTT, low albumin
- Diagnosed via viral antibody tests

# Autoimmune Hepatitis

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- Autoimmune inflammation of the liver
- Most common among women in 40s/50s
- Range of symptoms
  - Asymptomatic → acute liver disease → cirrhosis
- Anti-nuclear antibodies (ANAs)
  - Most common antibody abnormality
  - Sensitive, not specific
- **Anti-smooth muscle antibodies (ASMA)**
  - More specific for AHA
- Treatment: steroids and immunosuppressants

# Shock Liver

## Ischemic Hepatitis

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- Diffuse liver injury from **hypoperfusion**
- Often seen in ICU patients with shock from any cause
- Markedly elevated AST/ALT (1000s)
- Usually self-limited
- Pathology: **zone 3 necrosis** (near central vein)