

# **Alcoholic liver disease**

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- Alcoholic liver disease (ALD) is the leading cause of liver pathology in most Western countries
- it affects more than 2 million Americans and causes 27,000 deaths annually

## India : alcohol

- The prevalence of use of alcohol ranges from a low of 7% in Gujarat , to 75% in Arunachal Pradesh.
- The per capita consumption is  
4 lit/adult /year
- It accounts for 50% of CLD
- ALD cause of mortality M: 11/100000  
F: 6/100000

- Alcohol fits somewhere between a food and a drug.
- As a food, the metabolism of alcohol yields 7.1 kcal/g.
- It supplies calories but cannot be broken down or stored as protein, fat, or carbohydrate.

**Alcohol**

Alcoholic liver disease includes

- Fatty liver,
- Alcoholic hepatitis
- Cirrhosis.

Death occurs mainly due to

- Liver failure,
- Bleeding
- Esophageal varices,
- Kidney failure.

**Introduction**

When will ALD develop ??????

- If consumption of
- Men 60-80g/day for 10 years
- Women 20-40g/day for 10 years
  
- Cirrhosis develops only in 20-30% of chronic alcoholics

## Simple conversion

BEER : ml / 25  
WINE : ml / 10  
HARD LIQOUR : ml / 3

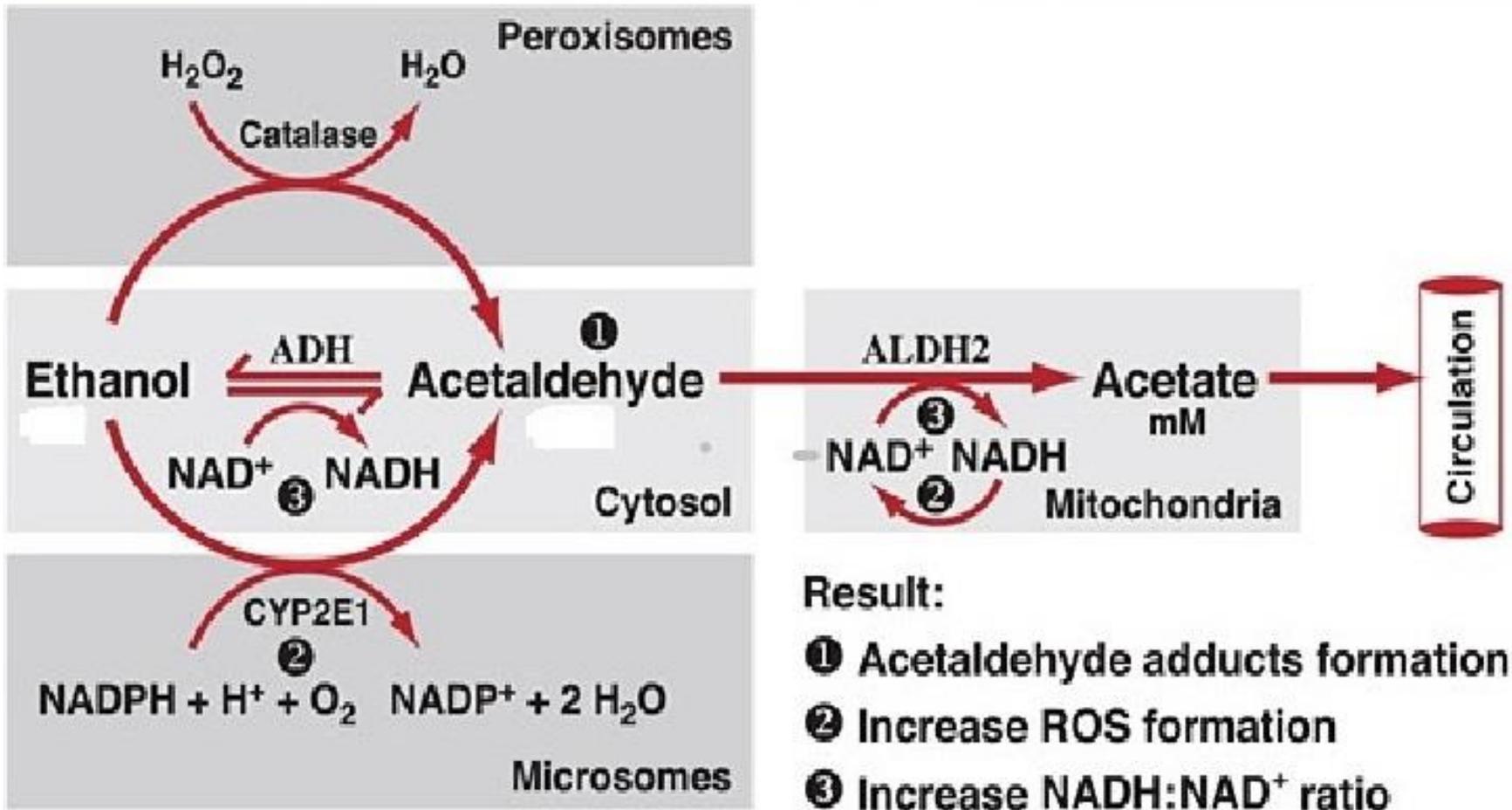


Gms of alcohol

# Ethanol Metabolism

- Ethanol is metabolized by three major systems in the liver:
- Alcohol dehydrogenases (ADHs),
- Cytochrome P450 2E1 (CYP2E1),
- Catalase

# Pathways



The ratio of NAD to NADH (redox potential) is therefore dramatically altered which contributes to the development of

- Alcoholic ketoacidosis,
- Impaired gluconeogenesis
- Alterations in lipid metabolism.

# Pathogenesis

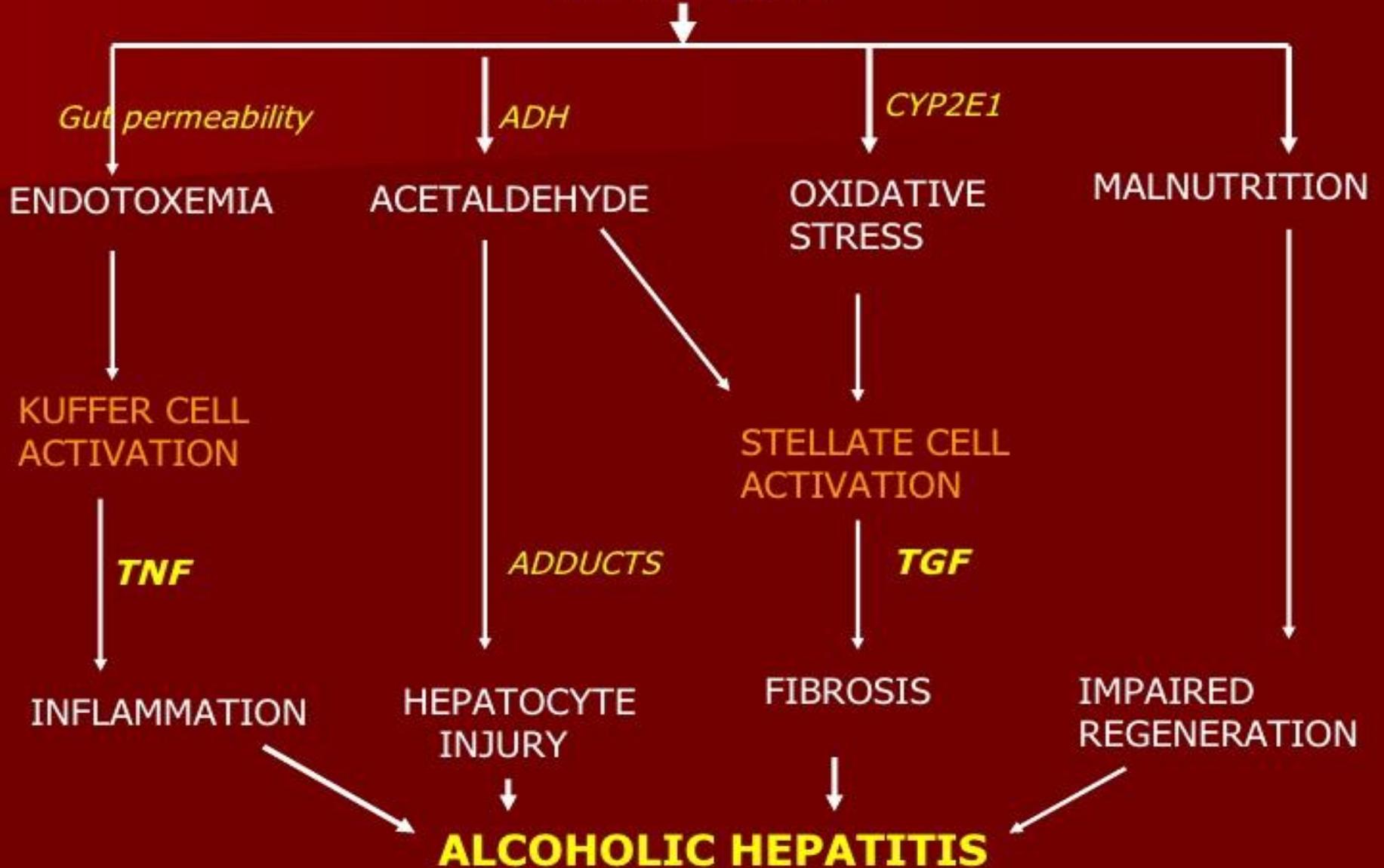
- Genetic factors ( **ADH2** ,**ALDH2** )
- Toxic metabolites of ALDH (**adducts**)
- Free radicals and oxidative stress (**ROS**)
- Role of immune system
- Hypermetabolic state of hepatocyte
- Cytokines (**TNF** ,**TGF** )
- Malnutrition

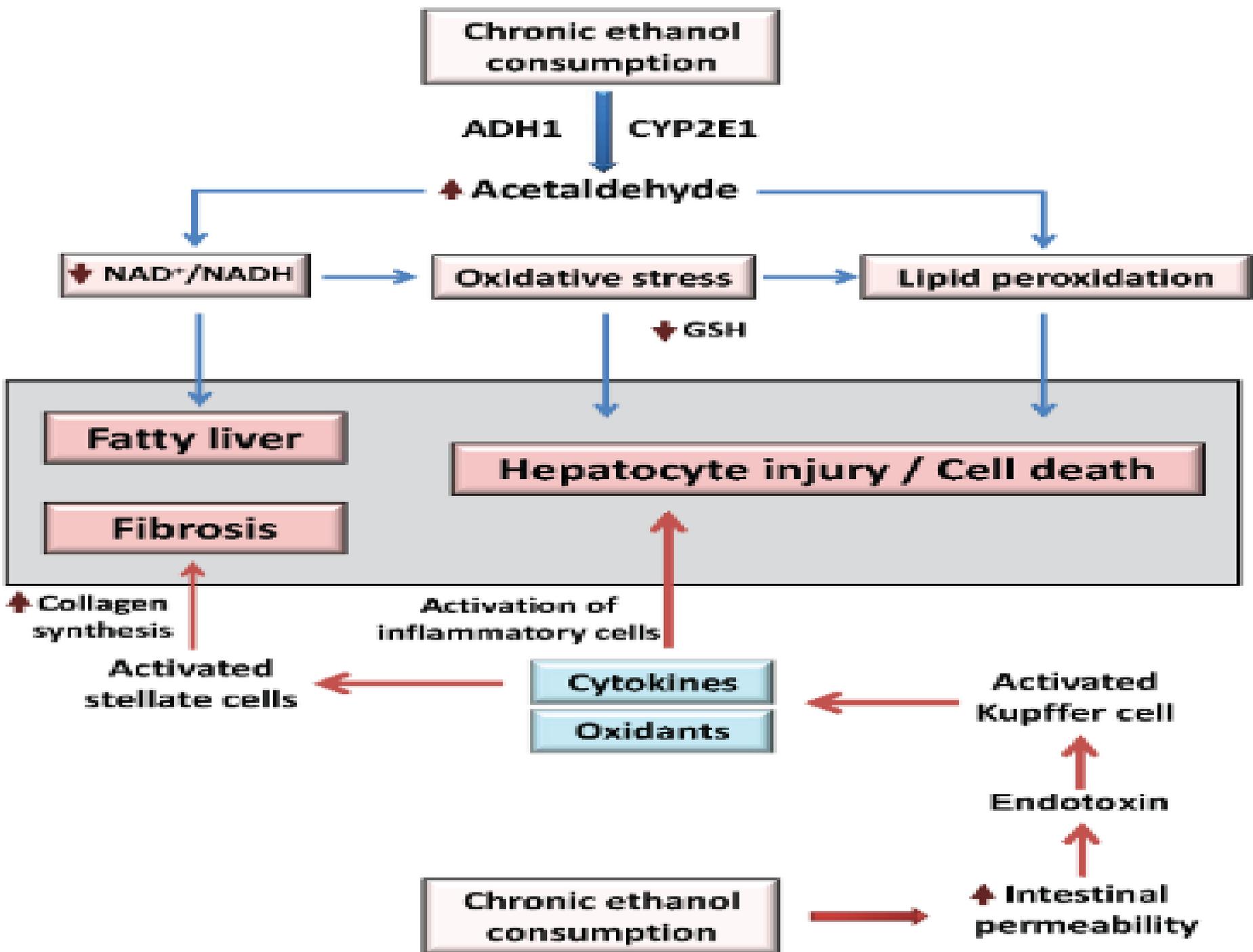
- Acetaldehyde generated from alcohol catabolism inducing **lipid peroxidation** and acetaldehyde-protein adduct formation.
- Induction of cytochrome P-450 generating **reactive oxygen species (ROS)** and augmenting catabolism of other drugs to form potentially toxic metabolites.
- Impaired metabolism of methionine resulting in **reduced glutathione levels** that are normally **protective for oxidative injury.**

- .

- Alcohol becoming a caloric food source, resulting in **malnutrition and vitamin deficiency**.
- Alcohol-mediated **release of bacterial endotoxin** from the gastrointestinal tract causing increasing **inflammatory responses**

# ALCOHOL





Normal

Fatty Liver

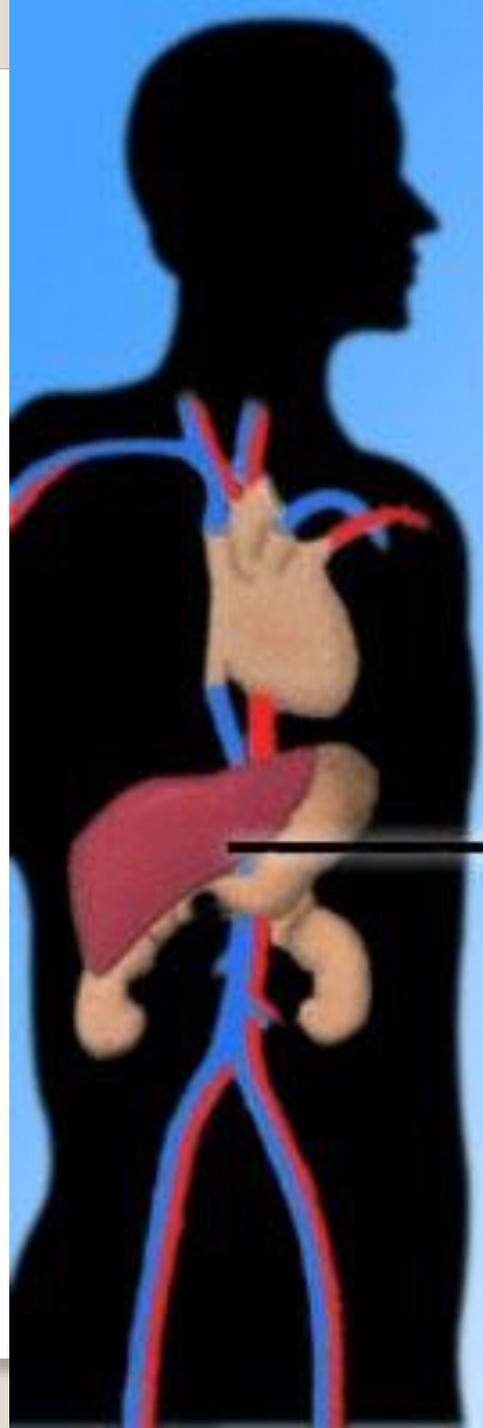
Cirrhosis

Alcoholic  
Hepatitis

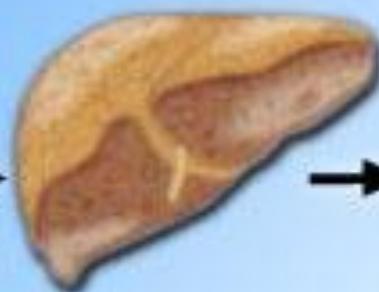
Liver  
Failure



## Stages of liver damage

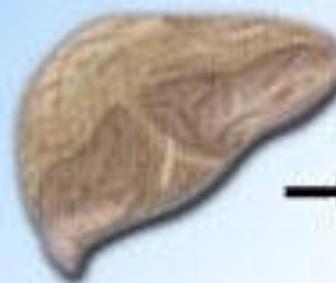


Fatty Liver



Deposits of fat causes liver enlargement.

Liver Fibrosis



Scar tissue forms.

Cirrhosis



Growth of connective tissue destroys liver cells.

# Risk of liver disease

- Amount of alcohol consumed,
- Genetic factors
- Female sex
- Obesity
- Chronic viral hepatitis
- Nutritional impairment and
- Drugs

# PATHOLOGY

- Steatosis
- Ballooning necrosis
- Mallory's hyaline bodies
- Neutrofilic cellular infiltration
- Fibrosis

- **Hepatic steatosis (fatty liver)** is marked by microvesicular lipid droplets and macrovesicular lipid droplets within hepatocytes.
- The liver becomes enlarged, **soft, greasy, and yellow**
- This condition is reversible

- Usually asymptomatic.
- The liver is enlarged, smooth, and occasionally tender
- Gamma-glutamyl transpeptidase (GGT) is often elevated.

**Signs and symptoms of fatty liver**

- **Alcoholic hepatitis** is characterized by inflammation and necrosis of liver cells.
- There is also Mallory body formation
- Fibrosis

- This stage usually is characterized by
- Hepatic tenderness,
- Pain,
- Anorexia,
- Nausea,
- Fever,
- Jaundice,
- Ascites, and
- Liver failure, but some people may be asymptomatic.

**Signs and symptoms of hepatitis**

- **Alcoholic cirrhosis** is the final and largely **irreversible** outcome.
- The liver is transformed **from fatty and enlarged to brown, shrunken, and non fatty**
- Early cirrhotic liver is one of fine, **uniform nodules** on its surface.
- The condition has traditionally been called **m micronodular or Laennec cirrhosis.**

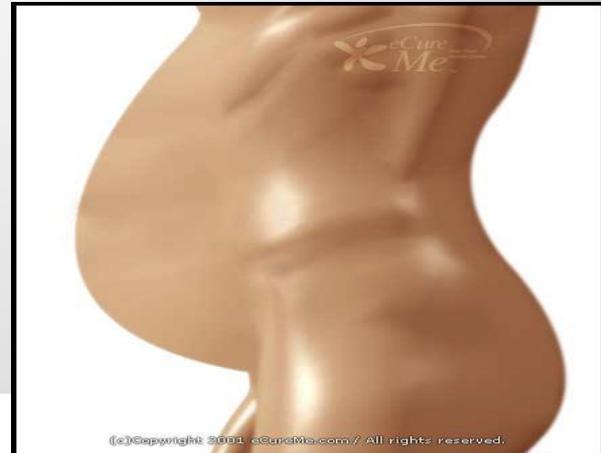
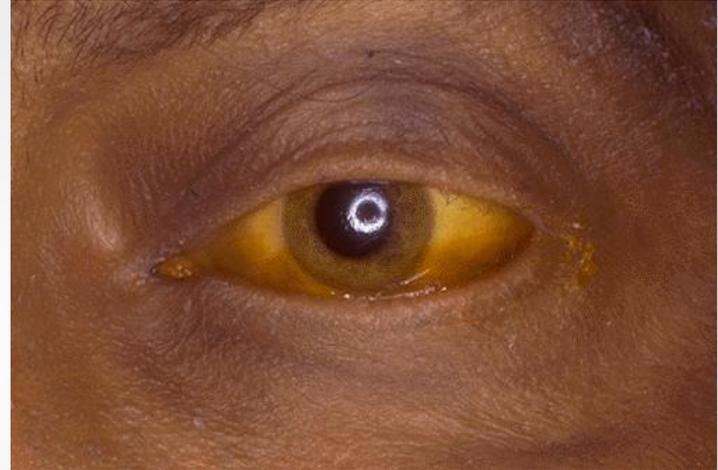
- With more advanced cirrhosis, regenerative processes cause the nodules to become larger and more irregular in size and shape.
- The nodules cause the liver to become relobulized through the formation of new portal tracts and venous outflow channels.

- The nodules may compress the hepatic veins, curtailing blood flow out of the liver and producing **portal hypertension, extrahepatic portosystemic shunts, and cholestasis.**

- Jaundice
- Hepatomegaly
- Esophageal varices
- Ascites
- Hepatic encephalopathy
- Oedema
- Bleeding disorders

**Signs and symptoms of cirrhosis**

# SYMPTOMS



- Fatigue and weakness
- Loss of appetite
- Weight loss and nausea
- Mental confusion
- Redness of the palms of the hands
- Small, red spider-like vessels
- Decreased urine output
- Pale or clay colored stools
- Vomiting blood (portal hypertension)
- Nosebleeds

## **OTHER SYMPTOMS**

**Thank you**