

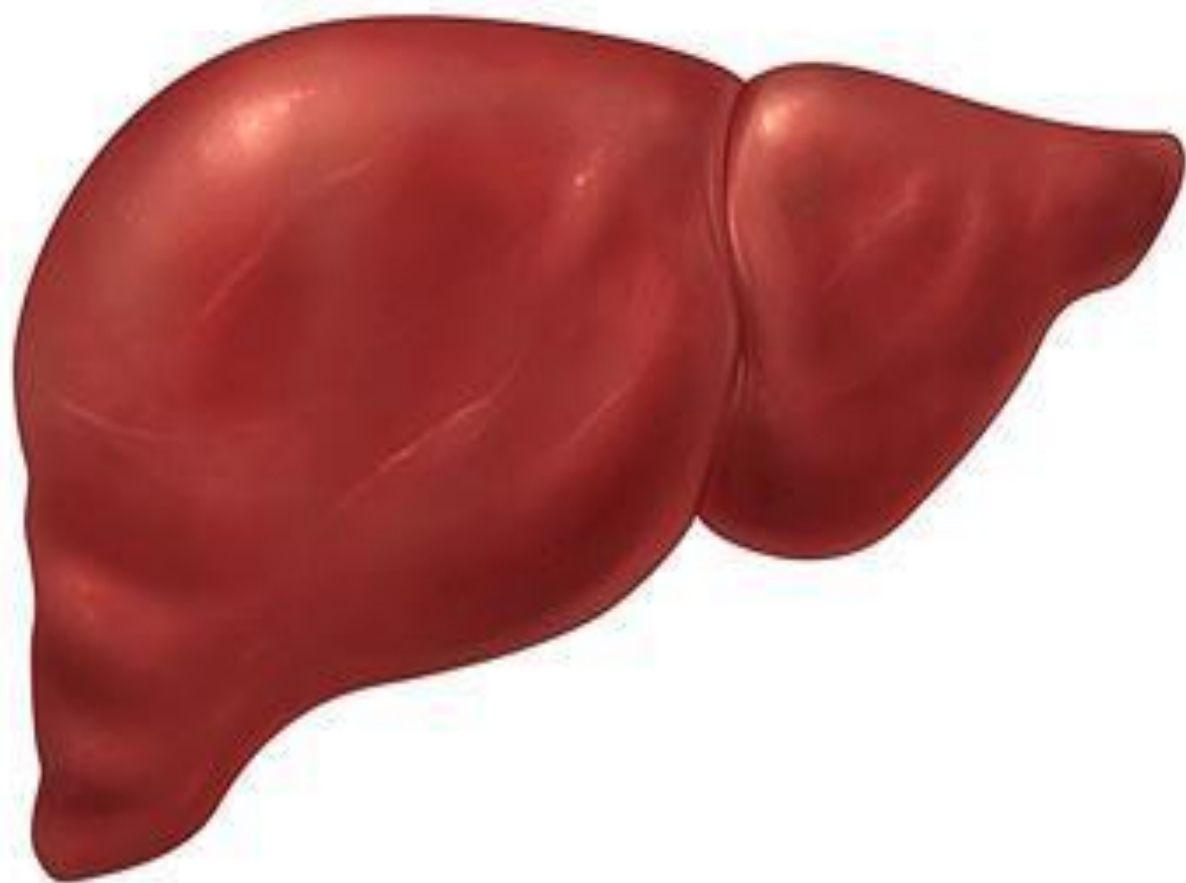
# Liver cirrhosis

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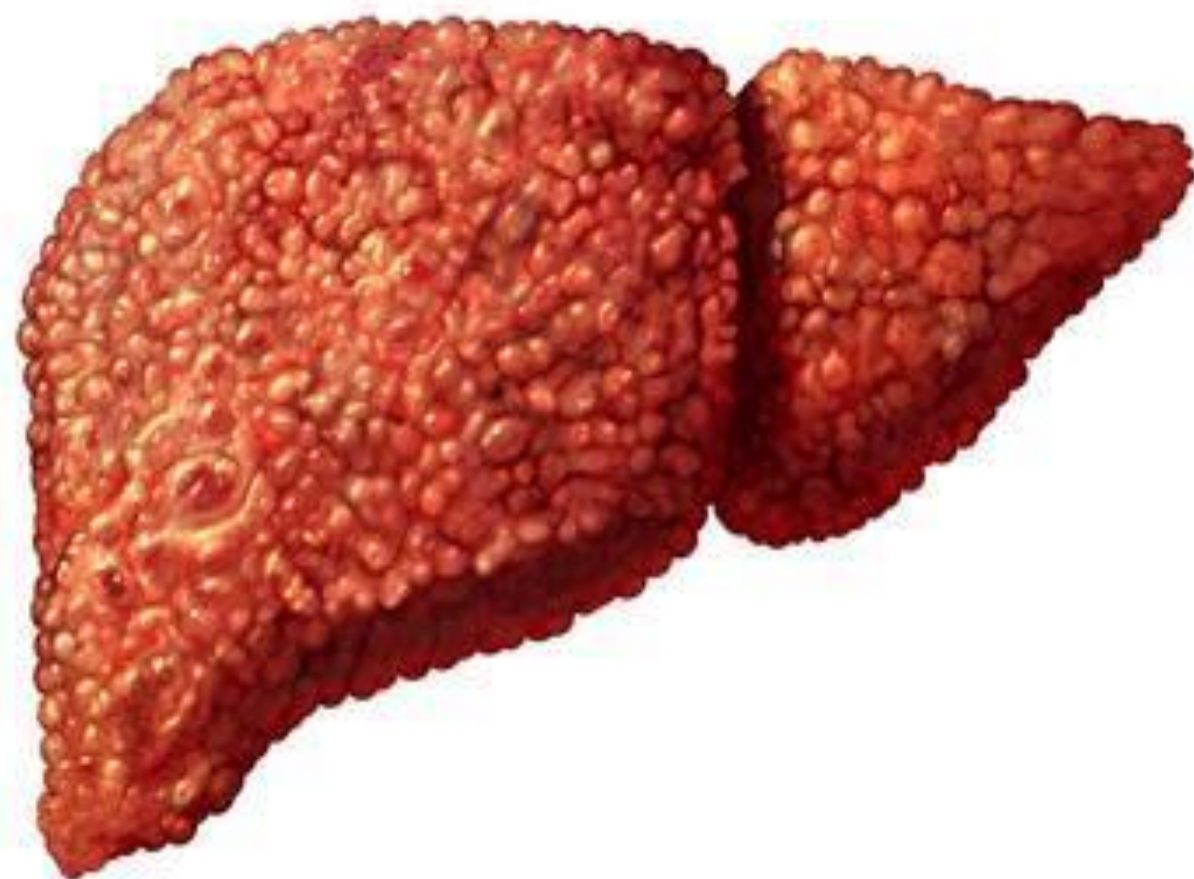
# Introduction

- ▶ Cirrhosis is scarring (fibrosis) of the liver caused by long-term liver damage. The scar tissue prevents the liver working properly.
- ▶ Cirrhosis is sometimes called end-stage liver disease because it happens after other stages of damage from conditions that affect the liver, such as hepatitis.
- ▶ Cirrhosis is a late-stage liver disease in which healthy liver tissue is replaced with scar tissue and the liver is permanently damaged.

Normal Liver



Liver with Cirrhosis



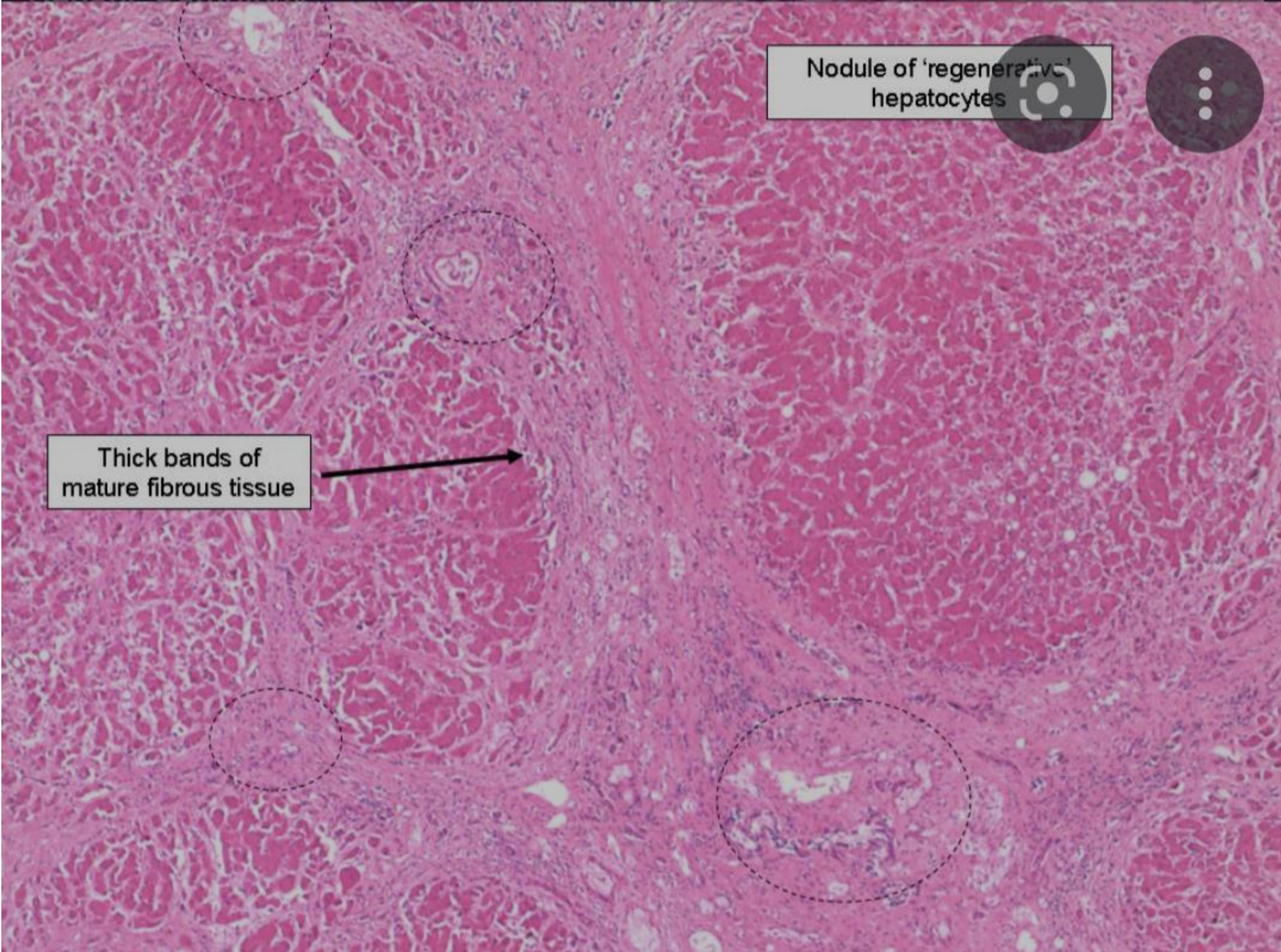
# Morphology

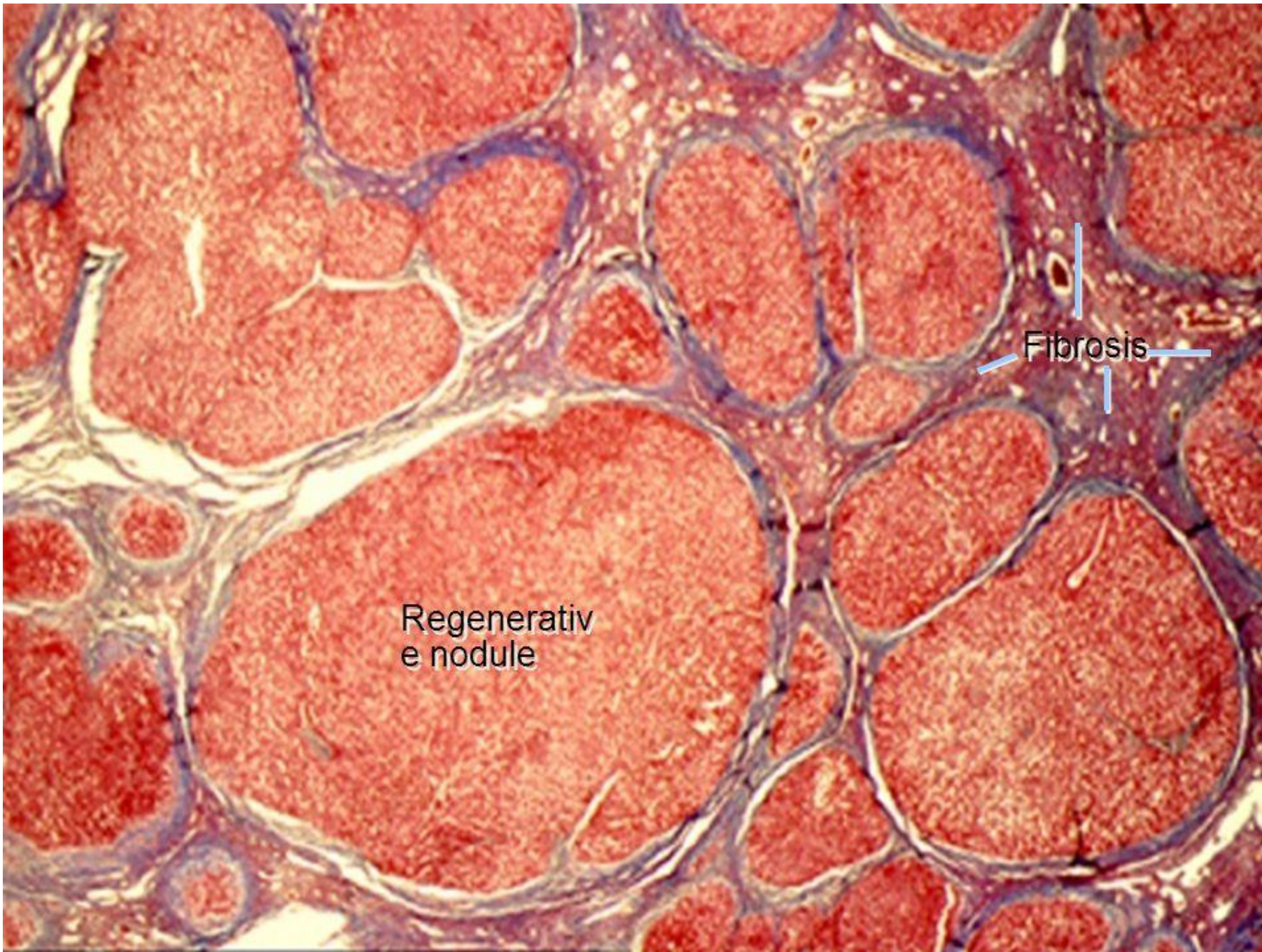
- ▶ Cirrhosis is characterized by alterations in the morphology, in the edges of the liver, and in the parenchyma, with regeneration nodules and fibrosis.
- ▶ Cirrhotic liver shows nodular hepatic contour, changes in volume distribution, including an enlarged caudate lobe and left lobe lateral segment, atrophy of the right and left lobe medial segments, widening of the fissures and the porta hepatis, and regenerative nodules

- ▶ Histologically, cirrhosis is characterized by vascularized fibrotic septa that link portal tracts with each other and with central veins, leading to hepatocyte islands that are surrounded by fibrotic septa and which are devoid of a central vein

Nodule of 'regenerative'  
hepatocytes

Thick bands of  
mature fibrous tissue





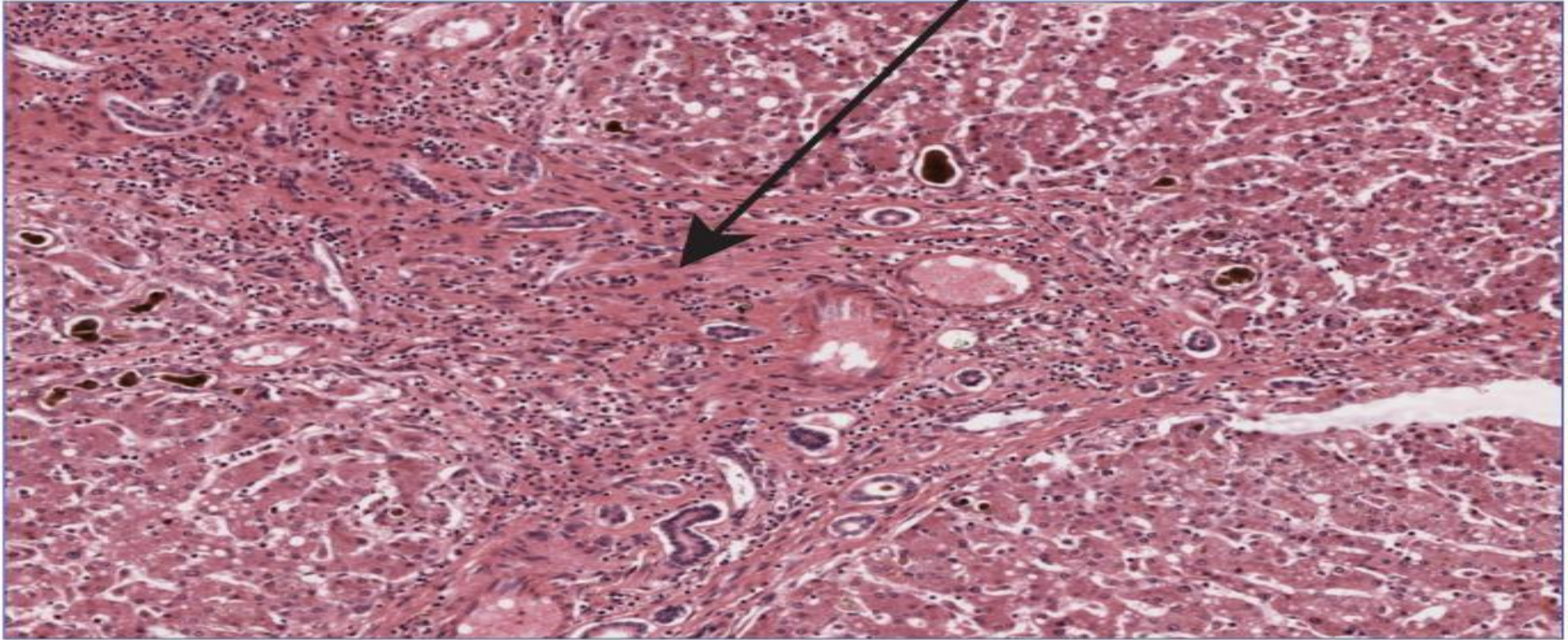
Regenerativ  
e nodule

Fibrosis

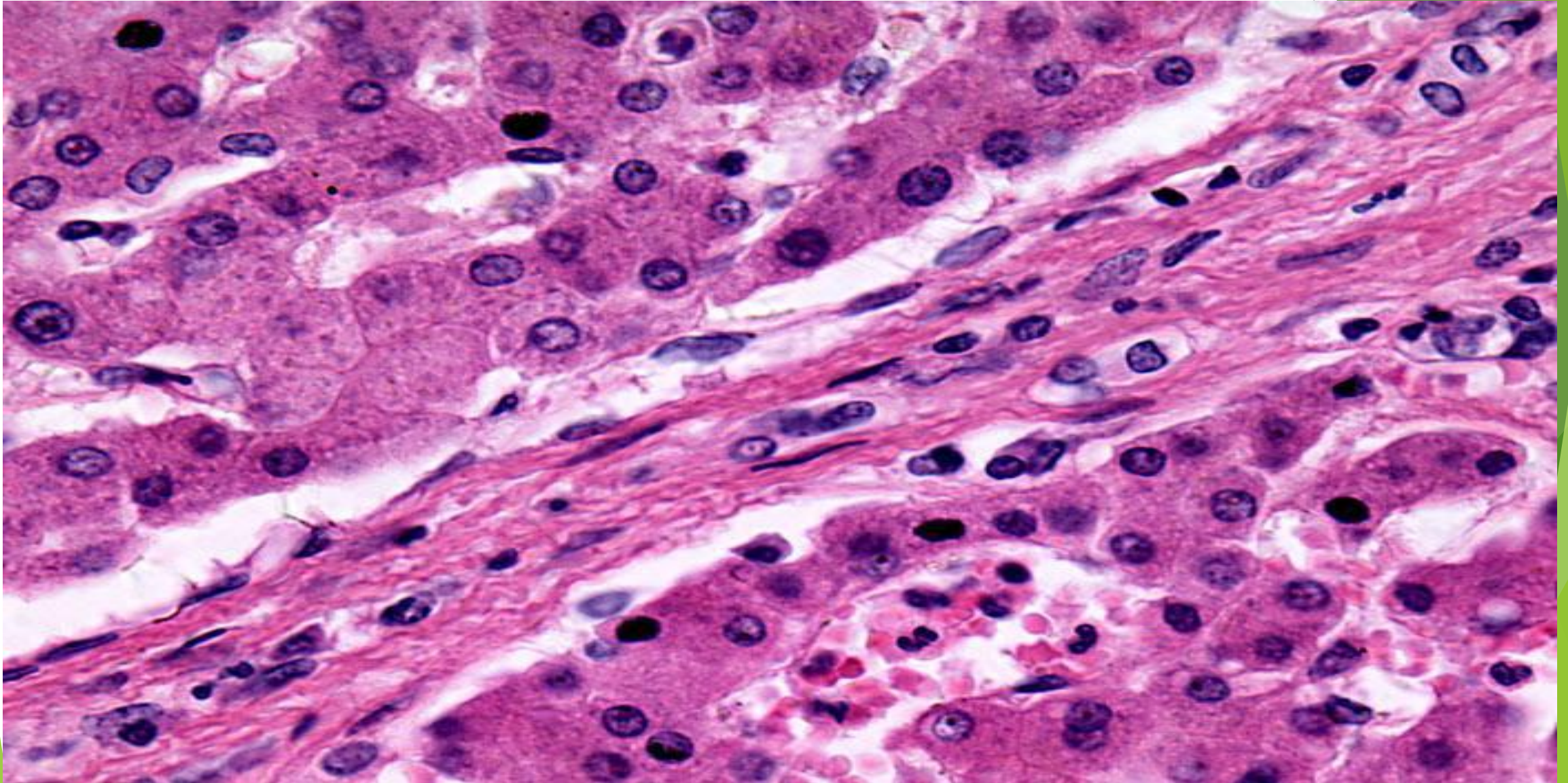
- ▶ Grossly, with the naked eye, a cirrhotic liver appears nodular, “hub-nailed”, on the external surface and nodular on the cut surface.
- ▶ Variation in size, color, shape and consistency is relevant and may help in the identification of the etiology.
- ▶ The liver is usually indurated shrunken and yellowish-tan but it may be enlarged and yellow as in alcoholic fatty cirrhosis, rusty as in hemochromatosis or large and green as in biliary obstruction.



## Fibrosis & Inflammation in cirrhosis



# Cirrhotic liver microscopy



# Causes

- ▶ Cirrhosis is most commonly caused by alcoholic liver disease, non-alcoholic steatohepatitis (NASH - the progressive form of non-alcoholic fatty liver disease), heroin abuse, chronic hepatitis B, and chronic hepatitis C. Heavy drinking over a number of years can cause alcoholic liver disease

wide range of diseases and conditions can damage the liver and lead to cirrhosis.

Some of the causes include :-

Chronic alcohol abuse

Chronic viral hepatitis (hepatitis B, C and D)

Fat accumulating in the liver (nonalcoholic fatty liver disease)

Iron buildup in the body (hemochromatosis)

Cystic fibrosis

Copper accumulated in the liver (Wilson's disease)

Poorly formed bile ducts (biliary atresia)

Alpha-1 antitrypsin deficiency

- ▶ Inherited disorders of sugar metabolism (galactosemia or glycogen storage disease)
- Genetic digestive disorder (Alagille syndrome)
- Liver disease caused by your body's immune system (autoimmune hepatitis)
- Destruction of the bile ducts (primary biliary cirrhosis)
- Hardening and scarring of the bile ducts (primary sclerosing cholangitis)
- Infection, such as syphilis or brucellosis
- Medications, including methotrexate or isoniazid

# Etiology

- ▶ The scar tissue blocks the flow of blood through the liver and slows the liver's ability to process nutrients, hormones, drugs and natural toxins (poisons). It also reduces the production of proteins and other substances made by the liver. Cirrhosis eventually keeps the liver from working properly.

- ▶ Cirrhosis is an advanced stage of liver fibrosis that is accompanied by distortion of the hepatic vasculature. It leads to shunting of the portal and arterial blood supply directly into the hepatic outflow (central veins), compromising exchange between hepatic sinusoids and the adjacent liver parenchyma, i.e., hepatocytes.

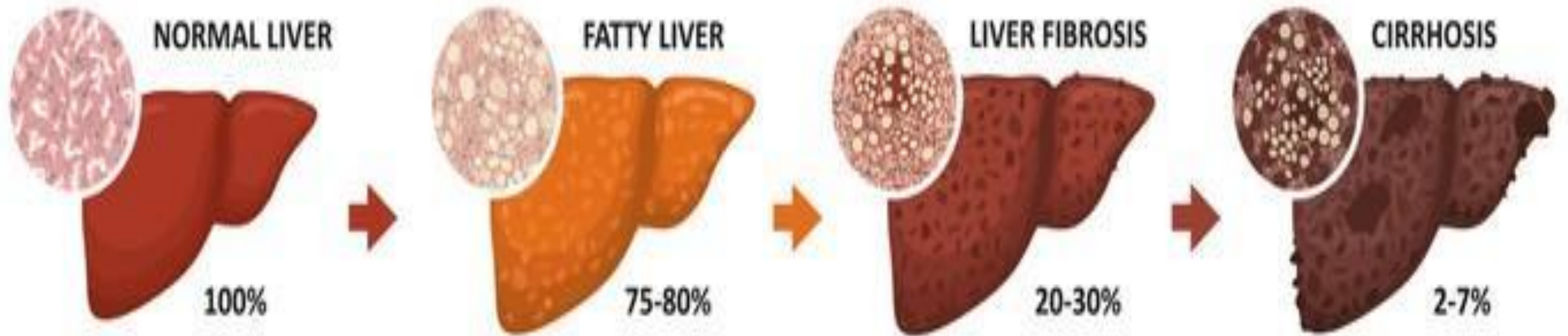
# Stages of liver cirrhosis

- ▶ There are 2 stages of cirrhosis: compensated cirrhosis and decompensated cirrhosis
- ▶ Compensated cirrhosis is the asymptomatic stage
  - Compensated patients do not have ascites, variceal hemorrhage, hepatic encephalopathy, or jaundice
  - Median survival time of patients with compensated cirrhosis is > 12 years



- ▶ **Decompensated cirrhosis** is the symptomatic stage
  - Decompensated cirrhosis is characterized by the presence or development of overt complications: ascites, jaundice, variceal hemorrhage, or hepatic encephalopathy
    - Median survival time of patients with decompensated cirrhosis is approximately 2 years

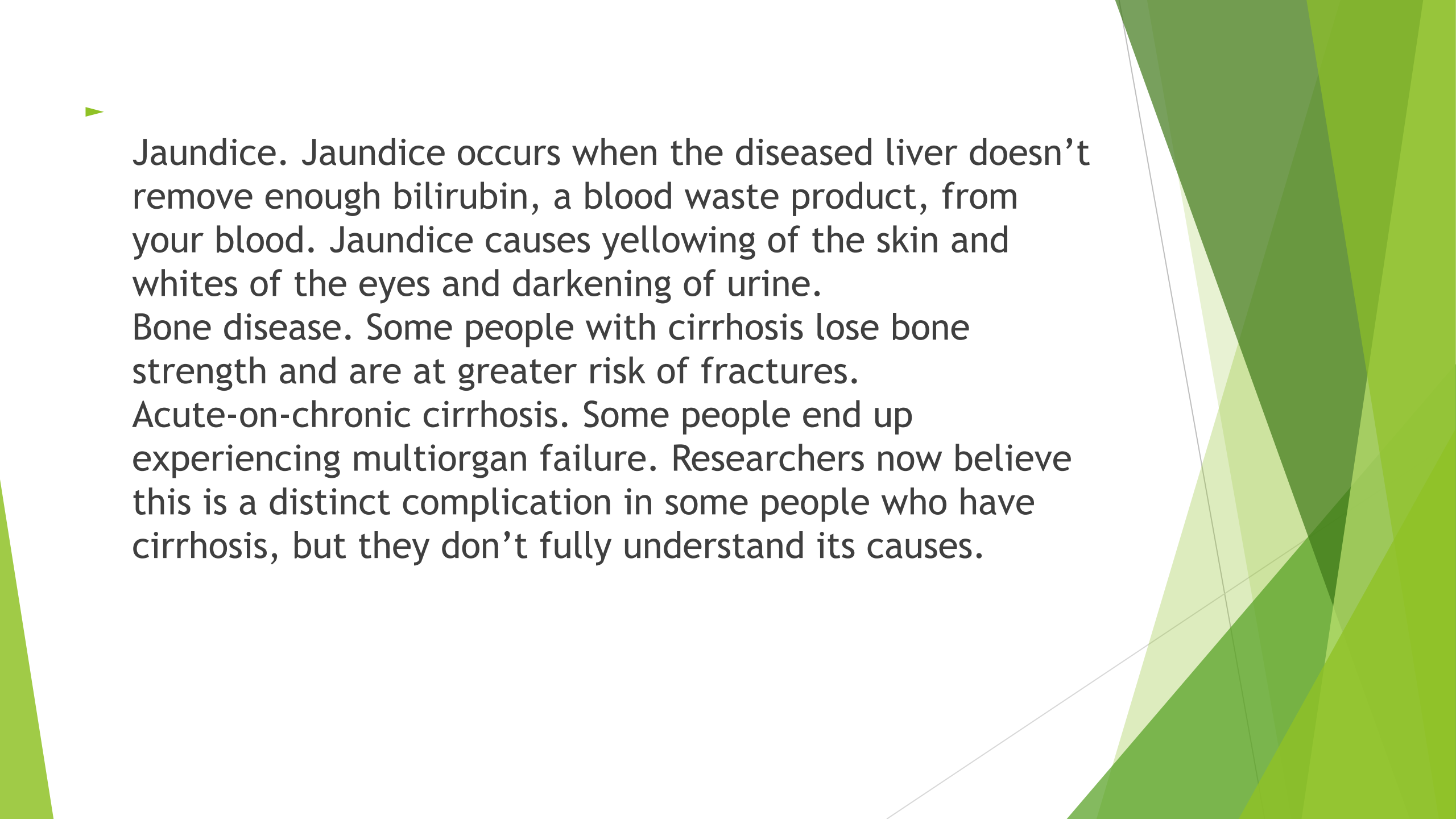
# STAGES OF LIVER DAMAGE



# Complications

- ▶ Complications of cirrhosis can include:
  - High blood pressure in the veins that supply the liver (portal hypertension). Cirrhosis slows the normal flow of blood through the liver, thus increasing pressure in the vein that brings blood to the liver from the intestines and spleen.
  - Swelling in the legs and abdomen. The increased pressure in the portal vein can cause fluid to accumulate in the legs (edema) and in the abdomen (ascites). Edema and ascites also may result from the inability of the liver to make enough of certain blood proteins, such as albumin.

- ▶ Enlargement of the spleen (splenomegaly). Portal hypertension can also cause changes to and swelling of the spleen, and trapping of white blood cells and platelets. Decreased white blood cells and platelets in your blood can be the first sign of cirrhosis. Infections. If you have cirrhosis, your body may have difficulty fighting infections. Ascites can lead to bacterial peritonitis, a serious infection
- ▶ Malnutrition. Cirrhosis may make it more difficult for your body to process nutrients, leading to weakness and weight loss. Buildup of toxins in the brain (hepatic encephalopathy). A liver damaged by cirrhosis isn't able to clear toxins from the blood as well as a healthy liver can. These toxins can then build up in the brain and cause mental confusion.

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▶ Jaundice. Jaundice occurs when the diseased liver doesn't remove enough bilirubin, a blood waste product, from your blood. Jaundice causes yellowing of the skin and whites of the eyes and darkening of urine.

Bone disease. Some people with cirrhosis lose bone strength and are at greater risk of fractures.

Acute-on-chronic cirrhosis. Some people end up experiencing multiorgan failure. Researchers now believe this is a distinct complication in some people who have cirrhosis, but they don't fully understand its causes.

# Diagnosis

- ▶ Cirrhosis can be diagnosed by radiology testing such as computed tomography (CT), ultrasound or magnetic resonance imaging (MRI) or via a needle biopsy of the liver.

# Risk factors

- ▶ Drinking too much alcohol. Excessive alcohol consumption is a risk factor for cirrhosis.  
Being overweight. Being obese increases your risk of conditions that may lead to cirrhosis, such as nonalcoholic fatty liver disease and nonalcoholic steatohepatitis.  
Having viral hepatitis. Not everyone with chronic hepatitis will develop cirrhosis, but it's one of the world's leading causes of liver disease
- ▶ Have a history of liver disease

Thank  
you!!!  
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