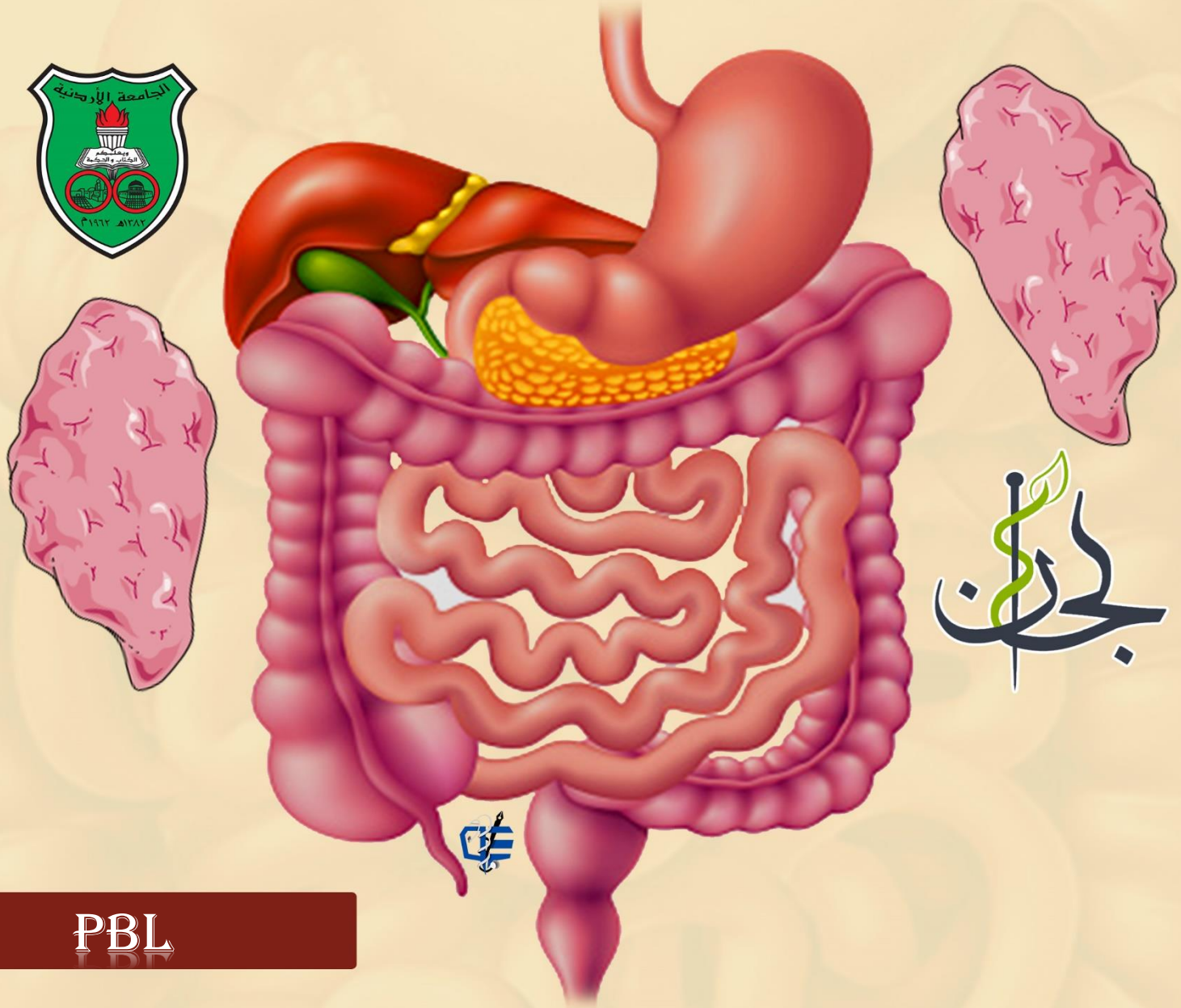
GastroIntestinal System



PBL

Doctor: Nadia khamees

Done by: Sanaa Halabiah

Edited by:

PBL lecs1+2: Introduction to clinical manifestations of some of the common GI disorders:

- Upper GI Bleeding
- liver cirrhosis and portal hypertension
- Viral Hepatitis A-E

Upper GI Bleeding

Bleeding that originates **above the ligament of Treitz.**

Signs and Symptoms

- Hematemesis; vomiting fresh blood.
- Melena; a loose shiny black tarry offensive smell stool.
- Dizziness; due to hypotension and volume loss.
- Abdominal pain and symptoms of peptic ulcer disease.
- Pallor due to anemia.
- Hypotension.
- Orthostasis; a drop in the blood pressure while the patient becomes in a standing position due to hypotension. it may precede that frank hypotension.

  So, to any patient with upper GI bleeding, we have to measure his blood pressure while he is supine and while he is standing because he may have normal blood pressure while he is supine and his blood pressure will drop upon standing up.
- Jaundice and other stigmata of chronic liver diseases
- Hematochezia; massive fresh bleeding which is not having the time to convert to the black color of melena.
- Coffee ground vomiting.
- they usually report a history of non-steroidal anti-inflammatory drug use.

Causes of upper GI bleeding

- Peptic ulcer disease "gastric and duodenal ulcers" (the most common)
- Esophageal varies
- Mallory- Weiss tear
- Erosions

other uncommon causes:

- malignancy
- arterial-venous malformations
- Hemobilia due to collagen carcinoma.
- Aorto-enteric fistulas; occurs in patients with an aortic aneurysm that did surgery for that aneurysm and a fistula then forms between the colon and the aorta which causes massive bleeding.
- Neoplasms
- AVM/Ectasia
- Dieulafoy's
- Stoma ulcers
- Esophageal ulcers
- Duodenitis

We will talk about some of these causes:

Peptic ulcer disease

A defect in the GI mucosa that extends through their muscularis mucosa, caused by an imbalance between the aggressive and defensive factors.

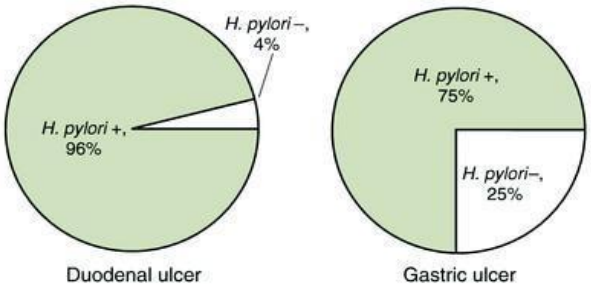
there are two common causes for property peptides disease: **Helicobacter Pylori infection and NSAIDs use**. Other causes such as acid hypersecretory state and antral G cell hyperplasia.

*Decreasing incidence

The association between H. Pylori and the duodenal and gastric ulcers:

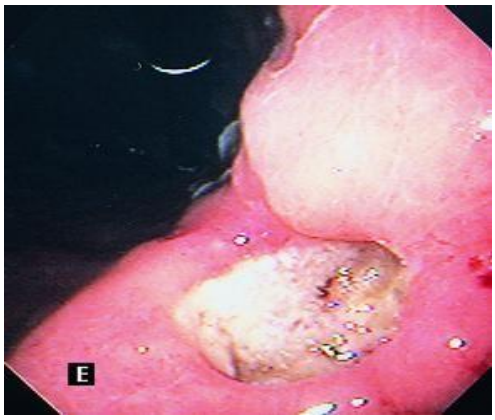
96% of general duodenal ulcers are associated with an H. Pylori infection while in gastric ulcers only 75% of them are associated with H. Pylori infection.

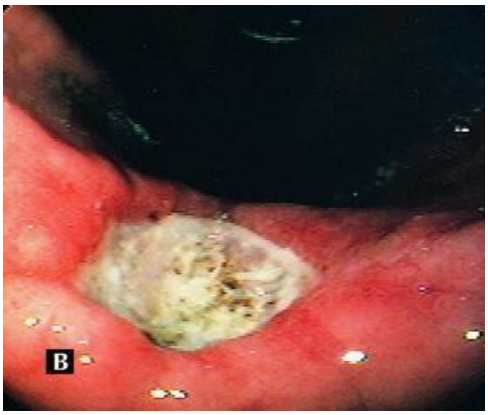
So, in duodenal ulcers, they used to eradicate with antibiotics without testing for the H. pylori while in gastric ulcer you have to test for H. Pylori infection because there are 25% of patients with gastric cancer have NO H. Pylori infection, it may be due to other causes such as malignancy.



Gastric ulcer

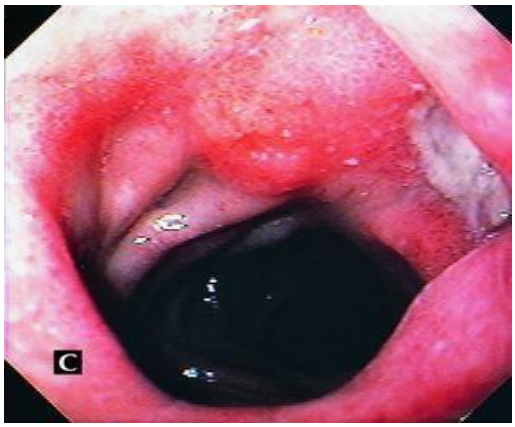
a defect in the normal mucosa. we call this a clean-based ulcer.

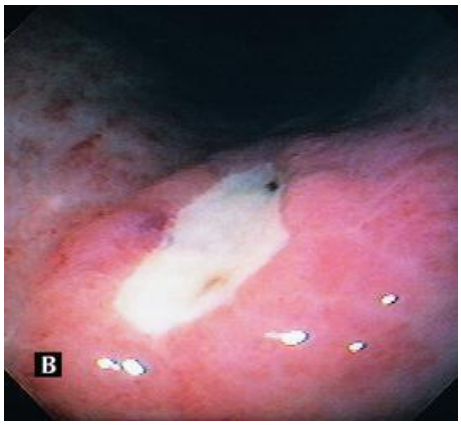




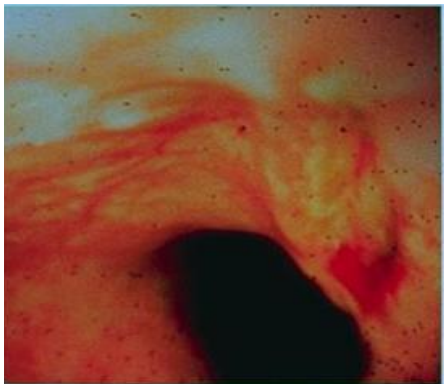
Duodenal ulcer

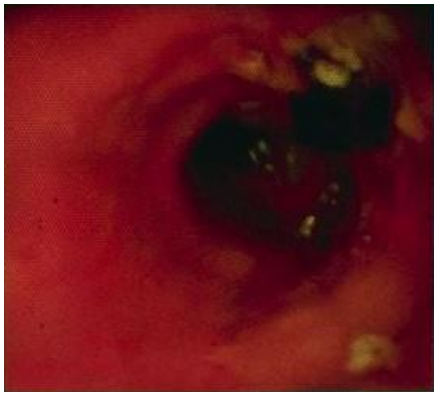
a defect in the healthy mucosa with surrounding inflammatory changes around the ulcer.





Mallory - Weiss



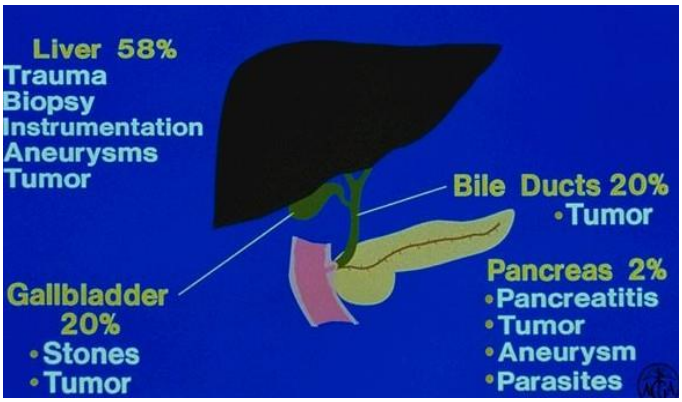


Laceration that occurs at the gastroesophageal junction in patients having episodes of forceful vomiting such as alcoholic patients or pregnant females with hyperemesis gravidarum "excessive vomiting during the first trimester"

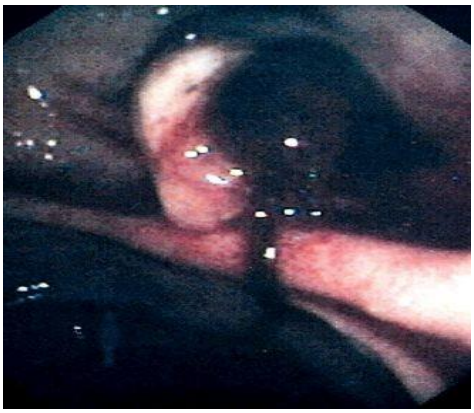
The classical presentation was found in 50% only.

Usually, It causes **minimal bleeding** and has a **self-limiting** course.

Hemobilia



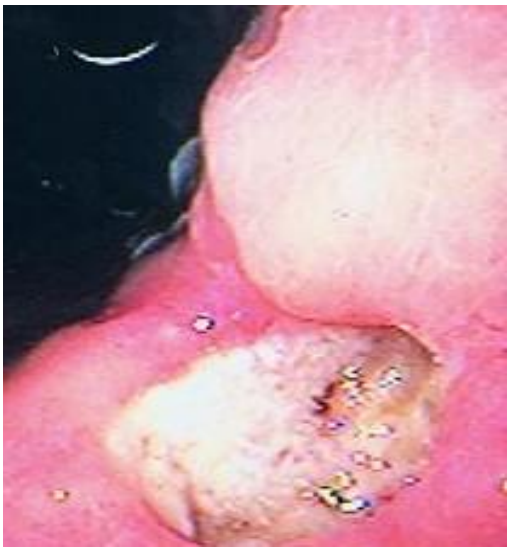
It is blood coming out from the bile tract, it may occur in patients with pancreatic issues such as tumors, biliary cancer, pharyngeal carcinoma, or gold stones.



this is the **ampulla of Vater**, and the hemophilia is coming out of it.

Stress ulcers

Caused by Vagal hyperstimulation and vascular hypoperfusion in particularly ill patients (ICU patients) such as patients with head injury or burn patients. not related to the usual stress that the usual people are exposed to.



Not related to H. Pylori infection or NASID use.
Usually, they are Multiple in the **body** and **fundus** of the stomach not the antrum as the H. Pylori-related peptic ulcer disease.

we call the stress ulcers:
In patients with head injury → **Cushing ulcers.**
In extensive burn patients → **Curling ulcers.**

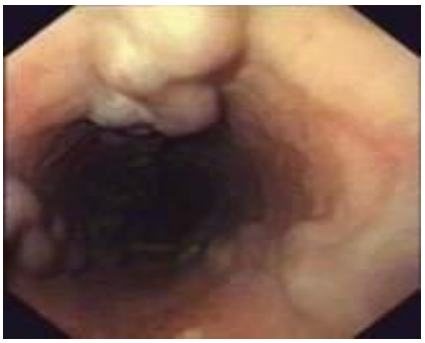
*Prophylaxis is indicated in critically

Esophageal varies

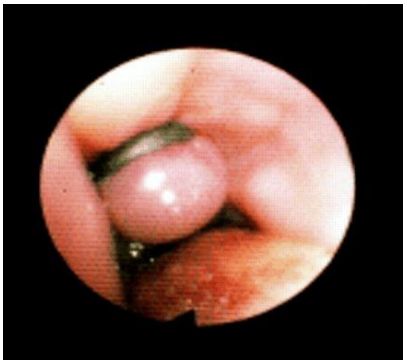
Dilated tortuous veins of the lower and mid esophagus.

occurs in patients with portal hypertension "secondary to portal HTN"

carries a very high mortality rate; 30% mortality after the first episode and 60% Rebleeding rate

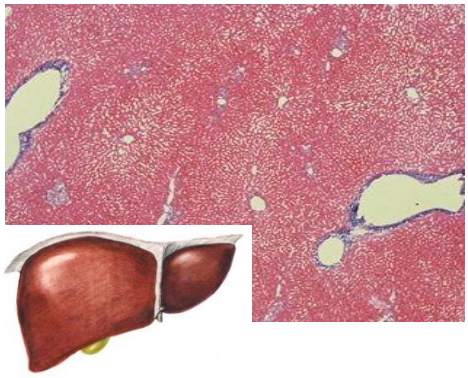


this is an upper endoscopy image with varix dilated tortuous vein at the distal part of the esophagus.

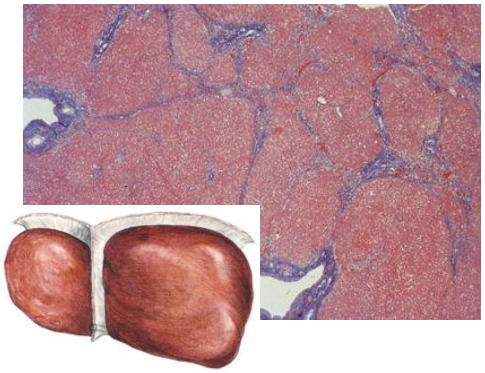


Esophageal Band Ligation; apply during endoscopy as a **treatment** option for patients with bleeding esophageal vases.

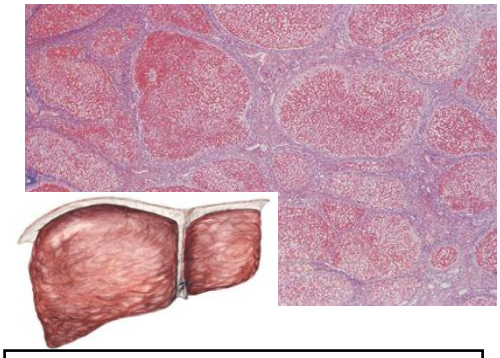
liver Cirrhosis and Portal Hypertension



healthy liver



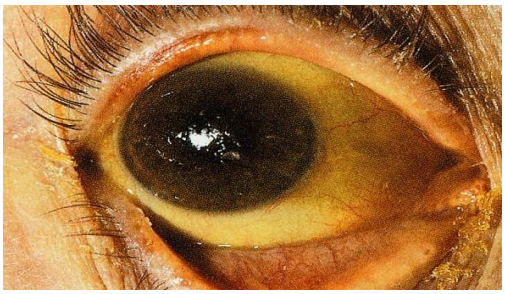
Liver Fibrosis



nodular liver that occurs in patients with liver cirrhosis

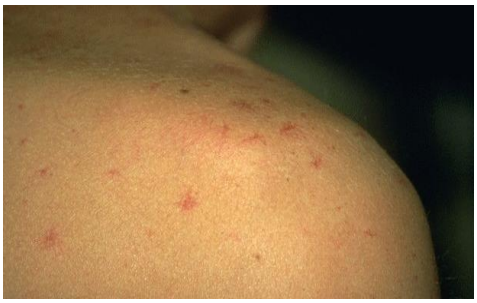
Clinical Manifestation of Liver Cirrhosis:

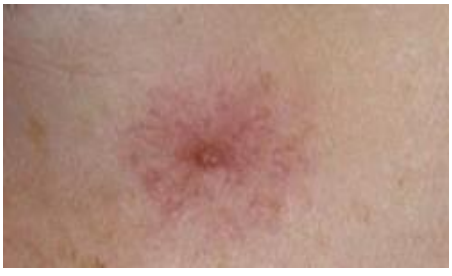
1. **Jaundice;** a common manifestation of liver cirrhosis, occurs when the bilirubin level is above 2.5-3 milligram per deciliter which leads to accumulation of bilirubin in the bloodstream causing yellowish discoloration of plasma and heavily perfused tissues.



yellowish discoloration of the sclera and the mucus membranes.

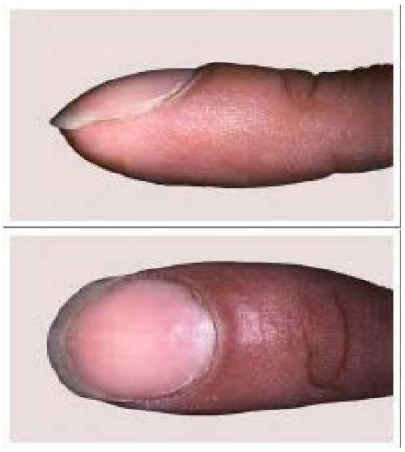
2. **Spider angiomas**; a small, centrally raised bumps (papules) on the anterior and posterior part of the chest, caused by a dilated arteriole (small artery). A network of dilated capillaries (tiny blood vessels) radiate from the arteriole. Pressing on the lesion causes the redness to disappear briefly, and there is a rapid return of redness once the pressure is lifted.



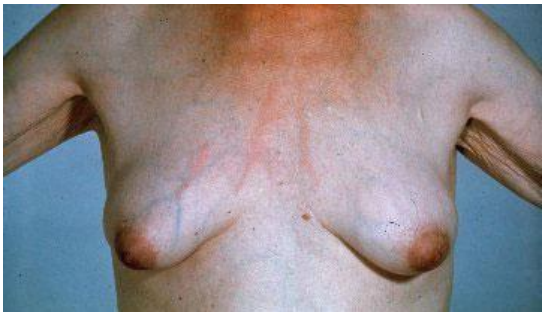


Notice the raised center and how the vessels are arranged like the spider!

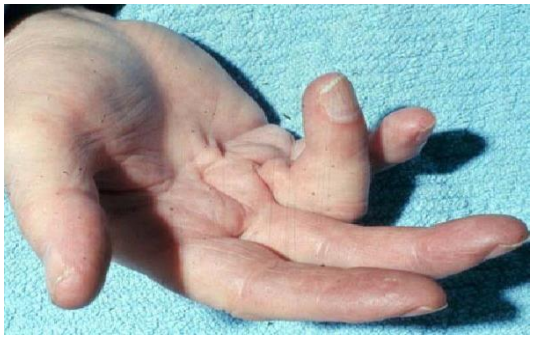
3. **Finger Clubbing**; enlargement of the terminal end of the digit over the distal phalanx thus, the angle between the nail and the nail bed is lost and the curvature of the nail increases with time.
   it is a common manifestation of liver cirrhosis, but it can occur in other diseases such as inflammatory bowel disease, cyanotic congenital heart diseases
   It is usually symmetrical and affects the fingers.
   sometimes it can be familiar in some patients.



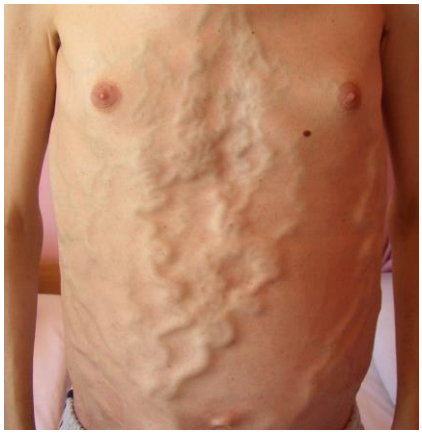
4. **Gynecomastia**; breast development in **male** patients that occur due to liver cirrhosis.
   * liver cirrhosis's female patients will develop **breast atrophy**, not gynecomastia.



5. **Dupuytren's Contractures**; a joint contracture that occurs in patients with liver cirrhosis.

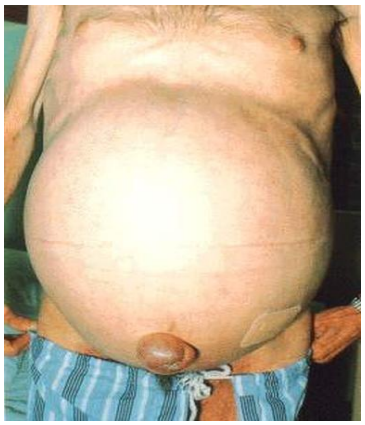


6. **Caput Medusae;** distended and engorged umbilical veins which are seen radiating from the umbilicus across the abdomen to join systemic veins.



Common Complications of Liver Cirrhosis:

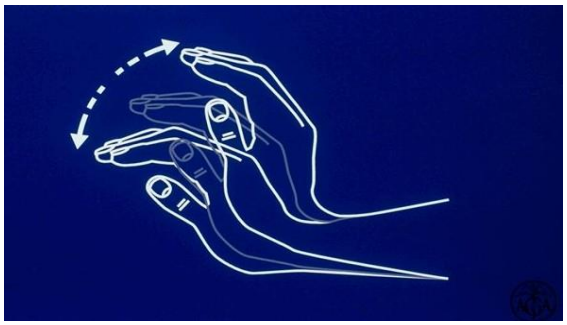
1. **Variceal bleeding** which as we said carries a very high mortality rate.
2. **Hepatorenal disease;** acute kidney injury in a patient with advanced liver disease.



3. **Ascites with SBP**; fluid collects in spaces within the abdomen with spontaneous bacterial peritonitis.

> this patient has **massive ascites,** he also developed an umbilical hernia due to massive ascites.

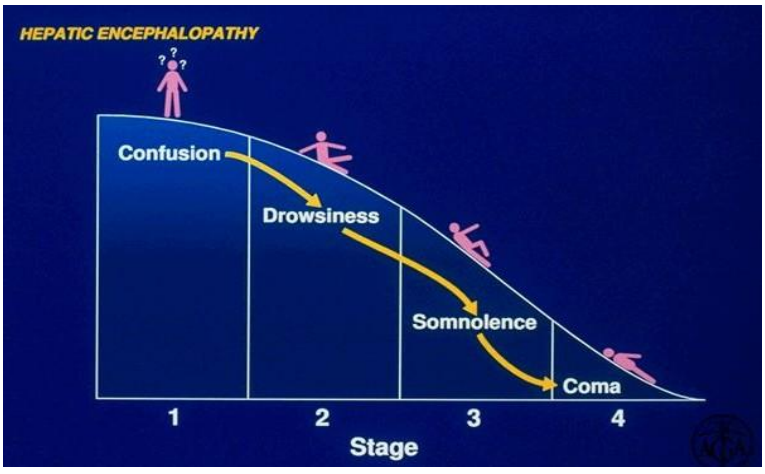
4. **Australia or flapping tremor;** a quick arrhythmic movement in background tonic muscle contraction, occurs in patients with hepatic encephalopathy, heart or respiratory failure.



5. **Hepatic Encephalopathy** due to increased ammonia level which may cause a decreasing level of consciousness.

The stages of hepatic encephalopathy according to **West Haven criteria on hepatic encephalopathy**

1. it starts from some confusion and reversal of the sleep/wake cycle.
2. Drowsiness; the patient still arousable in this stage.
3. Somnolence; the patient is sleepy all the time.
4. Finally, complete coma.



Viral Hepatitis A-E

Hepatitis A Virus

- It has an **Incubation Period** of around 15-50 days (an average of 30 days).
- **Clinical manifestations** vary with different age group; pediatric patients less than 6 years of age, only less than 10% of them will show jaundice and clinical manifestations, it will come just like any viral infections: slight fevers and jaundice while adult patients more than 14 years, 70-80% of them will show the illness, jaundice, abdominal pain and vomiting.
- **Complications** are rare, Fulminant hepatitis, Cholestatic hepatitis, or Relapsing hepatitis occurs in less than 1% of cases with acute liver failure, those patients may need a liver transplant.
- **Chronic security**; there is NO chronic hepatitis A infection;
  - In more than 99% of cases, the patient recovers the virus.
  - In less than 1% may develop fundamental hepatitis which then needs a liver transplant or may lead to death.
- **Transmission** through the fecal-oral route, the virus is shedding in the feces of the patient which is transmitted through the food.
  - Close personal contact (e.g., household contact, sex contact, child daycare centers)
  - Contaminated food, water (e.g., infected food handlers, raw shellfish)
  - Blood exposure (rare) (e.g., injecting drug use, transfusion)
- **Laboratory Diagnosis**
  - Acute infection is diagnosed by the detection of HAV-IgM in serum by EIA.
  - Past Infection immunity is determined by the detection of HAV-IgG by EIA.
- **Prevention:**

  There is a hepatitis A vaccine for people at risk; people with liver cirrhosis, chronic hepatitis B virus, (not included in the national vaccination program)

Hepatitis B Virus

- The **Incubation Period** range from 45-180 days (an average of 60-90 days)
- **Clinical manifestations**; patients less than 5 years, only 10% of them will show the clinical illness while adult patients will show the clinical illness much more common than the pediatric (Jaundice, abdominal pain, and others).
- Acute case-fatality rate: 0.5%-1%.
- Premature mortality from chronic liver disease: 15%-25%
- **Chronic infection;** pediatric less than 5 years are most common to develop chronic infection (30-90%) while adults most likely will recover the virus and some of them may develop chronic infection (2-10%).

patients with chronic hepatitis B virus may have:

- Chronic Persistent Hepatitis - asymptomatic
- Chronic Active Hepatitis - symptomatic exacerbations of hepatitis
- Cirrhosis of Liver
- Hepatocellular Carcinoma

- **Transmission**

  The concentration of hepatitis B virus in various body fluids:

  - High in blood, serum, and wound exudates.
  - Moderate in semen, vaginal fluid, and saliva.
  - Low/Not Detectable in urine, feces, sweat, tears, and breastmilk.

  Modes of Transmission:

  - Sexual - sex workers and homosexuals are, particularly at risk.
  - Parenteral - IVDA, Health Workers are at increased risk.
  - Perinatal - the main means of transmission in high prevalence populations, Mothers who are HBeAg positive are much more likely to transmit to their offspring than those who are not via the vertical pathway during the delivery

We have some precautions to prevent the transmission in pregnant females carrying the hepatitis B virus, but in patients where we do nothing for preventing that transmission, the baby will most likely get the infection from his mother and he will develop the chronic infection.

the baby isn't having enough immunity even to recognize the virus, so the virus lives in his hepatocytes friendly. during the childhood period, the virus is replicating happily in the liver without any response from his body till at some point in his age when the body discovers that there's a firm body in his liver and then starts the acute phases of inflammation

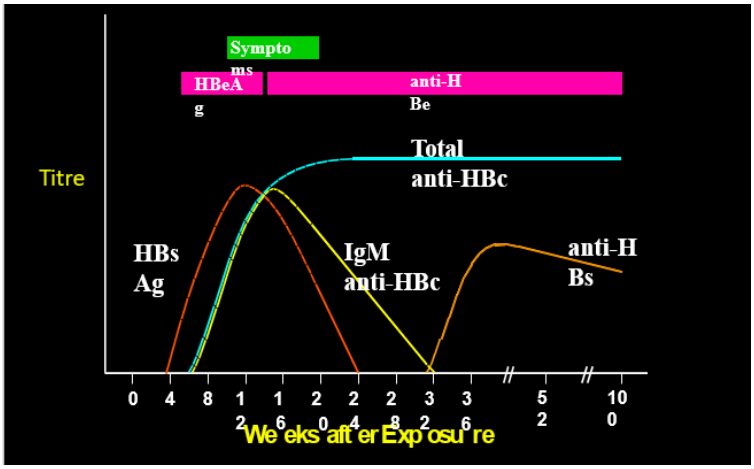
► **Diagnosis**

A battery of serological tests is used for the diagnosis of acute and chronic hepatitis B infection.

NOTE: it is not required from you in the exam to know the serological markers of the hepatitis B virus.

- **HBsAg** (surface antigen)- used as a general marker of infection.
- **HBsAb** (surface antibodies) - used to document recovery and/or immunity to HBV infection.
- **anti-HBc IgM** - a marker of acute infection.
- **anti-HBcIgG** - past or chronic infection.
- **HBeAg** - indicates active replication of the virus and therefore infectiveness.
- **Anti-HBe** - virus no longer replicating. However, the patient can still be positive for HBsAg which is made by integrated HBV.
- **HBV-DNA** - indicates active replication of the virus, more accurate than HBeAg especially in cases of escape mutants. Used mainly for monitoring response to therapy.

This chart illustrates an Acute Hepatitis B Virus Infection with Recovery, not a chronic infection



About the chart:

- patients during the acute illness have hepatitis B surface antigen **HBsAg** then they develop the anti-hepatitis B surface antibody **HBsAb** later on.
- during acute replication they have a high load of **HBeAg**, after recovery, they will develop the **Anti-HBe**
- there's a window period between the **HBsAg** in red and the **HBsAb** in orange, during that period we only find anti-hepatitis B core IgM that is positive **anti-HBc IgM.**
- so it is important when you are suspecting acute hepatitis B virus infection to measure **HBsAg**, **HBsAb,** and **anti-HBc IgM**.

► **prevention:**

- Vaccination - highly effective recombinant vaccines are now available. The vaccine can be given to those who are at increased risk of HBV infection such as health care workers. It is also given routinely to neonates as universal vaccination in many countries. Including in the Jordanian national vaccination program.
- pregnant patients with a high viral load of hepatitis B virus must get treatment during the third trimester to prevent vertical transmission.
- Hepatitis B Immunoglobulin - HBIG may be used to protect persons who are exposed to hepatitis B. It is particularly efficacious within 48 hours of the incident. It may also be given to neonates who are at increased risk of contracting hepatitis B i.e. whose mothers are HBsAg and HBeAg positive.
- Other measures - screening of blood donors, blood and body fluid precautions.

Hepatitis C Virus

► It is an **RNA** virus.
► **Incubation period** Range 2-26 weeks (an average 6-7 weeks)
► **Clinical illness (jaundice):** 30-40% (20-30%). **Persistent infection**: 85-100%
► Risk Factors Associated with **Transmission** of HCV:
- Transfusion or transplant from an infected donor
- Injecting drug use
- Hemodialysis (yrs on treatment)
- Accidental injuries with needles/sharps
- Sexual/household exposure to anti-HCV-positive contact
- Multiple sex partners
- Birth to HCV-infected mother

► **Chronic Hepatitis C Infection**
usually, in 75-70% of patients who get the infection, will get chronic hepatitis.
- The spectrum of chronic hepatitis C infection is essentially the same as chronic hepatitis B infection.
- All the manifestations of chronic hepatitis B infection may be seen, albeit with a lower frequency i.e. chronic persistent hepatitis, chronic active hepatitis, cirrhosis, and hepatocellular carcinoma.

► **Diagnosis**
- HCV antibody - generally used to diagnose hepatitis C infection. Not useful in the acute phase as it takes at least 4 weeks after infection before an antibody appears.
- HCV-RNA - various techniques are available e.g. PCR and branched DNA. May be used to diagnose HCV infection in the acute phase. However, its main use is in monitoring the response to antiviral therapy.
- HCV-antigen - an EIA for HCV antigen is available. It is used in the same capacity as HCV-RNA tests but is much easier to carry out.

How we do the **Diagnosis**?

FIRST, we send HCV antibody → positive or negative HCV antibody:

positive HCV antibody → either ❶he got the infection in the past and now he recovered the virus or ❷he has a chronic infection

negative HCV antibody → there is no chronic HCV.

THEN, If we have positive HCV, we send HCV-RNA

positive HCV-RNA → the patient has a chronic hepatitis C virus

negative HCV-RNA → that the patient has removed hepatitis C virus infection and he recovered the virus and there's no need to follow up that patient.

► **Prevention:**

There is NO proven vaccine for hepatitis C virus so we have to prevent high-risk behaviors, screen for blood, organ, tissue donors, and Blood and body fluid precautions.

Hepatitis D Virus

► Cannot infect the patient alone, it has to propagate only in the presence of the hepatitis B virus in two ways:

☑ **Coinfection** – the patient gets both hepatitis B and hepatitis D virus from the same source. Develop a severe acute disease. low risk of chronic infection.

☑ **Superinfection** – the patient is already having a chronic hepatitis B virus and he gets hepatitis D from another source. usually develop chronic HDV infection but may be present as acute hepatitis. It has a high risk of severe chronic liver disease.

► **Transmission:** it is transmitted just like hepatitis B, blood-borne transmission.

- Percutaneous exposures
- injecting drug use
- Per-mucosal exposures
- sex contact

Hepatitis E Virus

- **Incubation period**: Range 15-60 days, (an average of 40 days).
- **Case-fatality rate**: self-limiting illness in most patients with CFR (1%-3%). carries a high mortality in pregnant females (15%-25%)
- **Illness severity**: Increased with age
- **Chronic sequelae**: there is NO Chronic C hepatitis, it causes acute infection only.
- it is just like hepatitis A in terms of modes of **transmission** (the fecal-oral route) through infected food.

Quick summary of all the viral hepatitis viruses:

	A	*B*	*C*	*D*	*E*
SOURCE OF VIRUS	feces	blood/ blood-derived body fluids	blood/ blood-derived body fluids	blood/ blood-derived body fluids	feces
ROUTE OF TRANSMISSION	fecal-oral	percutaneous permucosal	percutaneous permucosal	percutaneous permucosal	fecal-oral
CHRONIC INFECTION	no	yes	yes	yes	no
PREVENTION	pre/postexposure immunization	pre/postexposure immunization	blood donor screening; risk behavior modification	pre/postexposure immunization; risk behavior modification	ensure safe drinking water

There are some charts and microscopic images in the slides not included in the sheet and didn't explain by the professor if you would like to see them.

Sorry for the errors if there was ++ goooooood luck :)