

The background is a textured, golden-brown color. In the top-left and top-right corners, there are faint, stylized floral or leaf-like patterns in a lighter shade of yellow.

Hepatitis

Learning outcomes

- ❧ LO1:Definition of hepatitis and other related terms
- ❧ LO2:Causes of hepatitis
- ❧ LO3:Clinical features of hepatitis
- ❧ LO4:Diagnosis hepatitis
- ❧ LO5:Differential diagnosis of hepatitis
- ❧ LO6:Treatment

☞ **LO1:**

☞ **Hepatitis:** inflammation of liver; presence of inflammatory cells in organ tissue

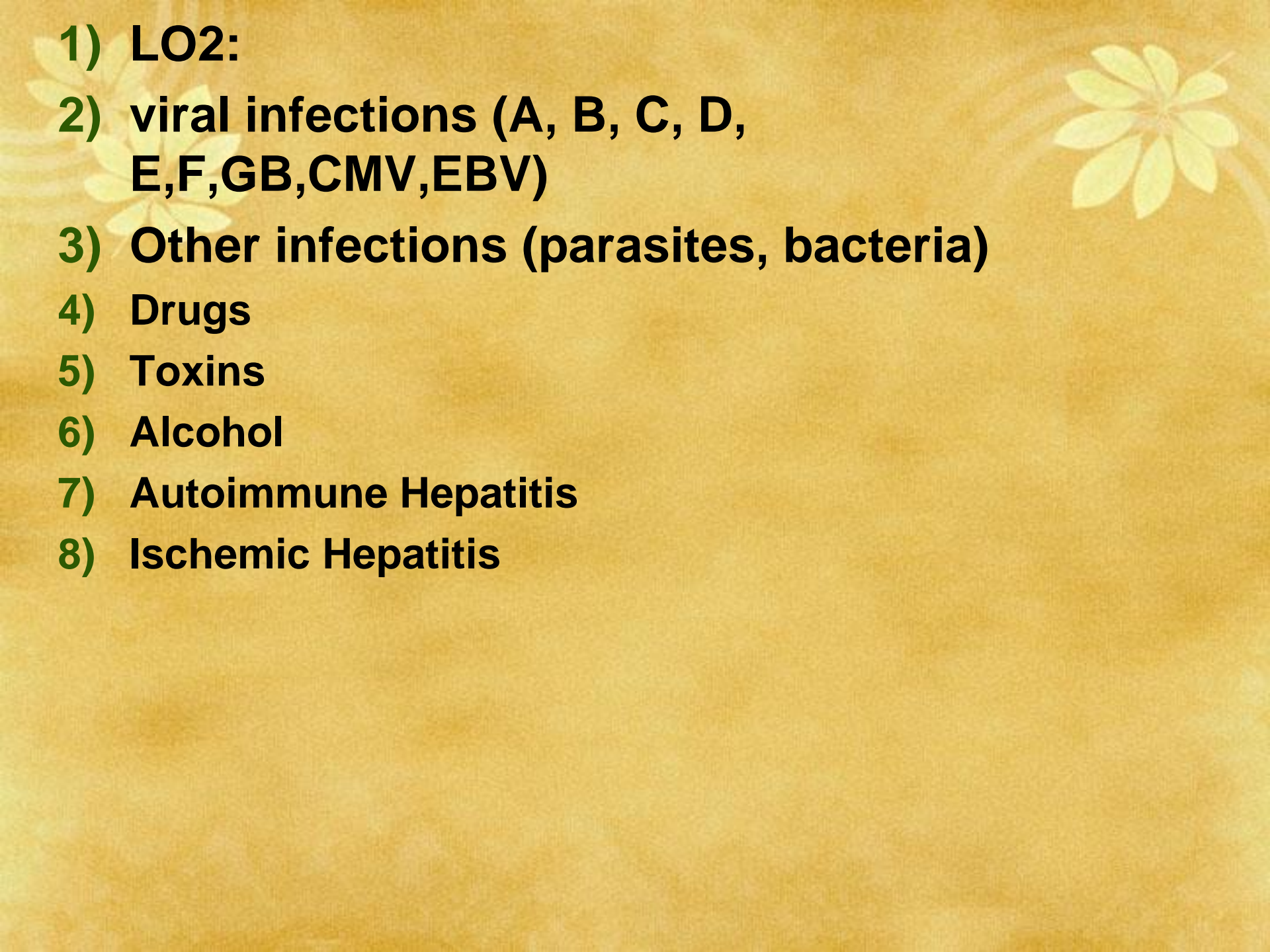
☞ **Acute Viral Hepatitis:** symptoms last less than 6 months

☞ **Acute Hepatic Failure:** Massive hepatic necrosis with impaired consciousness within 8 weeks of onset of illness.

☞ **Chronic Hepatitis:** Inflammation of liver for at least 6 months

☞ **Cirrhosis:** Replacement of liver tissue → fibrosis, scar tissue

☞ **Fulminant Hepatitis:** severe impairment of hepatic functions or severe necrosis of hepatocytes in the absence of preexisting liver disease

- 
- 1) LO2:**
 - 2) viral infections (A, B, C, D, E, F, GB, CMV, EBV)**
 - 3) Other infections (parasites, bacteria)**
 - 4) Drugs**
 - 5) Toxins**
 - 6) Alcohol**
 - 7) Autoimmune Hepatitis**
 - 8) Ischemic Hepatitis**

LO3:Classic presentation: infectious hepatitis

- ☞ Phase 1 - Viral replication; Patients are asymptomatic during this phase.**
- ☞ Phase 2 – Prodromal**
- ☞ Phase 3 - Icteric phase**
- ☞ Phase 4 - Convalescent phase; symptoms and icterus resolve. Liver enzymes return to normal.**

LO3:

1. Prodromal phase:

- ☞ Patients experience anorexia, nausea, vomiting, alterations in taste, arthralgia, malaise, fatigue, urticaria, and pruritus. Some develop an aversion to cigarette smoke.
- ☞ When seen by a health care provider during this phase, patients are often diagnosed as having gastroenteritis or a viral syndrome.

2. Icteric Phase

- ☞ Jaundice, Patients may note dark urine, followed by patients become icteric and may develop right upper quadrant pain with hepatomegaly.

LO3:

☞ Severe cases may result in **Fulminant Hepatitis:**

1. Hepatic Encephalopathy: B/L asterixis, palmar erythema
2. Hepatorenal syndrome
3. Bleeding diathesis

LO3: Physical Exam

- ❧ **Low-grade fever.**
- ❧ **Dehydration such as tachycardia, dry mucous membranes, loss of skin turgor, and delayed capillary refill.**
- ❧ **Icteric phase: icterus of the sclerae or mucous membranes or discoloration of the tympanic membranes.**
- ❧ **The skin may be jaundiced and may reveal urticarial rashes.**
- ❧ **Liver may be tender and diffusely enlarged with a firm, sharp, smooth edge.**

LO4:Diagnosis of hepatitis

- **LFT:** Elevation of serum transaminases not diagnostic, but useful
 - ALT elevated more than AST
 - Urine analysis: presence of **bilirubin**.
 - **Serum bilirubin:** Total bilirubin may be elevated in infectious hepatitis. Bilirubin levels higher than 30 mg/dL indicate more severe disease.
 - **Alkaline phosphatase:** if elevated significantly, consider abscess or biliary obstruction.
 - **Prothrombin time (PT)** if prolonged → impaired synthetic function of the liver.
 - **BUN serum creatinine** → decreased renal function suggests fulminant hepatic disease.
- **U/s**
- **Liver biopsy**

L05:Differential diagnosis

**Abdominal Trauma, Blunt
Obstruction, Small Bowel
Aneurysm, Pancreatitis
Cholangitis**

**Cholecystitis and Biliary Colic
Cholelithiasis
Gastritis and PUD
Gastroenteritis**

Hepatitis A

- ❧ Common cause of **acute hepatitis**
- ❧ RNA
- ❧ Transmission fecal-oral route; Contaminated water and food
- ❧ The incubation period of hepatitis A virus is 2-7 weeks,
- ❧ AST & ALT levels usually return to reference ranges over 5-20 weeks.
- ❧ **Mild self-limited** disease and confers lifelong immunity to hepatitis A virus. Chronic infection with hepatitis A virus does not occur.
- ❧ Treatment: supportive

Diagnosis: HAV

- ❧ ****Serum Serology: presence of serum antigens and immunoglobins**
- ❧ **HAV: IgM anti-HAV: positive at the time of onset of symptoms; results remain positive for 3-6 months after the primary infection**
- ❧ **Anti-HAV IgG appears soon after IgM and generally persists for many years.**

Hepatitis C

- ❧ **RNA virus**
- ❧ **Incubation period: 7-8 weeks**
- ❧ **Parenteral Transmission: IV drug users**

Hepatitis C

- ☞ Usually clinically mild, does not cause significant acute illness
- ☞ Fluctuating elevations of AST & ALT
- ☞ 20% likelihood of developing cirrhosis
- ☞ 50% likelihood of developing **chronic hepatitis**

Diagnosis: HCV

☞ **HCV: Anti-HCV**; cannot distinguish acute from chronic infection

☞ **EIA**: antibodies against core protein and nonstructural proteins; may appear 3 – 5 months after infection

PCR: used to detect viral RNA → HCV

80% of cases: patients are **asymptomatic** and do not develop icterus.

Treatment: Interferon alpha, Ribavirin; PEG-IFNs (better sustained absorption, a slower rate of clearance, and a longer half-life than those of unmodified IFN)



Hepatitis: B & D

Pathophysiology

Transmission 3 main ways:

- ❧ **Parenteral/percutaneous route----IV
Drug Users, needle sticks,
Hemodialysis patients**
- ❧ **Sexually**
- ❧ **Vertical/ Perinatal route**



AT Risk Groups

- ❧ **IV drug users**
- ❧ **People receiving multiple blood transfusions**
- ❧ **Sexual promiscuity**
- ❧ **People in contact with HBV carriers**
- ❧ **Travelers to endemic areas of South America, Southern Asia, and Africa**
- ❧ **Resident and employees of residential care facilities**
- ❧ **Health Care Workers**

Clinical Presentation

- ❧ **Acute Hepatitis B - less than 6 months; Based on significant aminotransferase activity due to inflammatory injury**
- ❧ **Symptoms are often non-specific symptoms such as myalgia, malaise , nausea, fatigue , pruritus, abdominal pain, RUQ, jaundice**
- ❧ **Fulminant Hepatitis--Acute HBV results in Liver Failure**

- ❧ **Chronic Hepatitis B - greater than 6 months**

- ❧ **Carrier State with low replication**
Seroconversion from HBeAg to HBeAB

Diagnosis

❧ **Serology**

❧ **Liver Chemistry tests**

❧ **AST, ALT, ALP, and total Bilirubin**

❧ **Histology--Immunoperoxidase staining**

❧ **HBV Viral DNA--Most accurate marker of viral DNA and detected by PCR**

❧ **Liver Biopsy--to determine grade(Inflammation) and stage(Fibrosis) in chronic Hepatitis**

Serology

HBsAg

- ❧ **Present in acute or chronic infection**
- ❧ **Detectable 1 to 2 weeks after infection**

HBeAg

- ❧ **Appears shortly after HBsAg**
- ❧ **Indicates viral Replication and Infectivity**

HBsAB(Anti-HBS)

- ❧ **Present after vaccination or clearance of HBsAg(Usually 1 to 3 months)**
- ❧ **Indicates immunity to HBV**

Hb core Antibody (IgM anti-Hbc or IgG anti-HBc)

- ❧ **Only Serological marker of HBV during "Window Period"**

Progression

- ❧ **Incubation Period: 30-180 days**
- ❧ **Acute HBV Infection: 90% resolve by themselves**
- ❧ **less than 1% develop fulminant hepatic failure**
- ❧ **Chronic HBV Infection: 2-10% progress to chronic state**
 - ❧ **Risk of Liver Cirrhosis: 8% to 20%**
 - ❧ **5% to 10% of people progress to HCC with or without preceding cirrhosis; less than 5% achieve a chronic carrier state**

L05:Treatment

A) Acute HBV infection: supportive.

B) Chronic HBV infection

1) Interferon therapy – First Line

☞ **Interferon alpha: 3x weekly Sub-Q**

☞ **Side effects: "Flulike Symptoms", alopecia, rash, diarrhea**

☞ **PINF-alpha (pegylated interferon-alpha)**

Better Choice than IFN-Alpha

Treatment cont.

2) **Nucleoside Analogues**

☞ **Lamivudine**

☞ **Entecavir – 1st line**

☞ **Telbivudine**



3) Nucleotide analogues

☞ **Tenovir**

☞ **Adefovir – 1st line**

Prophylaxis

HBV Vaccine

- ☞ Indicated for everyone and especially those in high risk groups
 - ☞ IM injection at 0,1,6 months in infants and adults
 - ☞ Response greater than 90% after 3rd dose

HBV Pregnant Mothers

- ☞ Give 1st dose of Hep B vaccine and Hep B Immunoglobulin(HBIG) 0.5 ml within 12 hours of birth.
 - ☞ 2nd dose at 1 month, 3rd at 6 months
 - ☞ Recheck at 12 months for active infection

Others i.e. those receiving a needle stick

- ☞ Should receive 1st dose vaccine within 48 and no later than a week.



Transplant

❧ **Last resort for those with advanced Liver Disease and HCC due to infection**

HEPATITIS D

Transmission

- ☞ Only as co-infection with acute HBV or with superinfection in chronic HBV carrier
 - ☞ Requires outer envelope of HBsAg for replication and transmission
 - ☞ Can progress to chronic disease
 - ☞ Incubation Period 30 to 150 days

Serology

- ☞ Hepatitis D antibody (Anti-HDV)
 - ☞ Indicates HDV superinfection
 - ☞ Ab not always present in acute infection---requires repeat testing

Hepatitis E

- ⌘ Hepatitis E virus (HEV) RNA virus
- ⌘ Enterically transmitted infection; fecal-oral route, typically self-limited
- ⌘ Symptoms of **acute hepatitis**
- ⌘ Incubation period of hepatitis E virus is 2-9 weeks

Diagnosis

☞ Serum, liver, and stool samples can be tested for HEV RNA

☞ Anti-HEV antibodies:

- IgM (acute)
- IgG (chronic)

AST & ALT are elevated

Treatment: supportive