

# *Hepatobiliary disease*

***Hepatology***  
***Davidson's principles and  
practice of medicine***

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# *Learning outcomes*

LO1: Anatomy of Hepatobiliary system

LO2: Metabolism of bilirubin

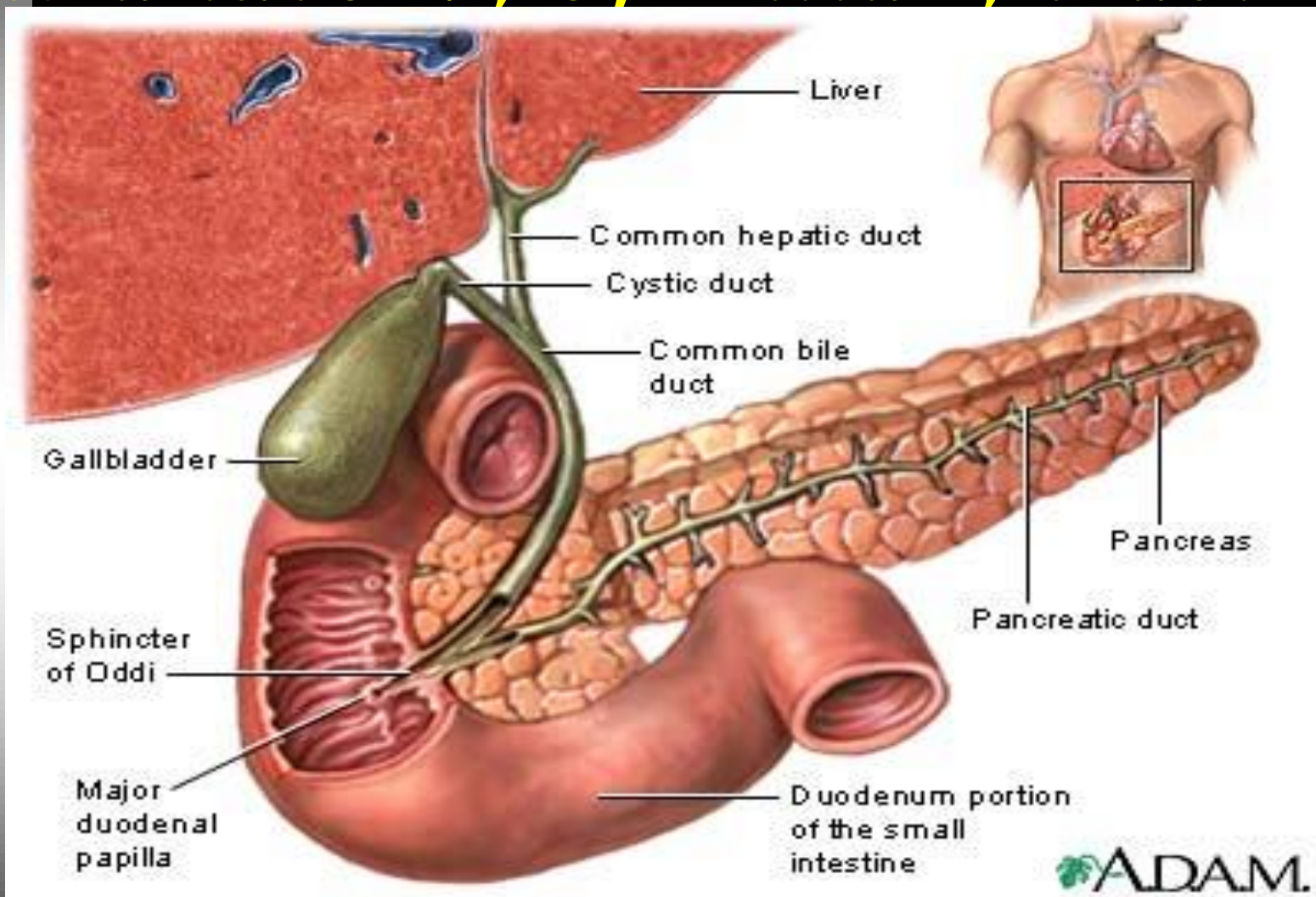
LO3: Pathophysiology of jaundice

LO4: Mechanism of jaundice

LO5: Aetiology of jaundice

LO6: Laboratory investigation of hepatobiliary diseases

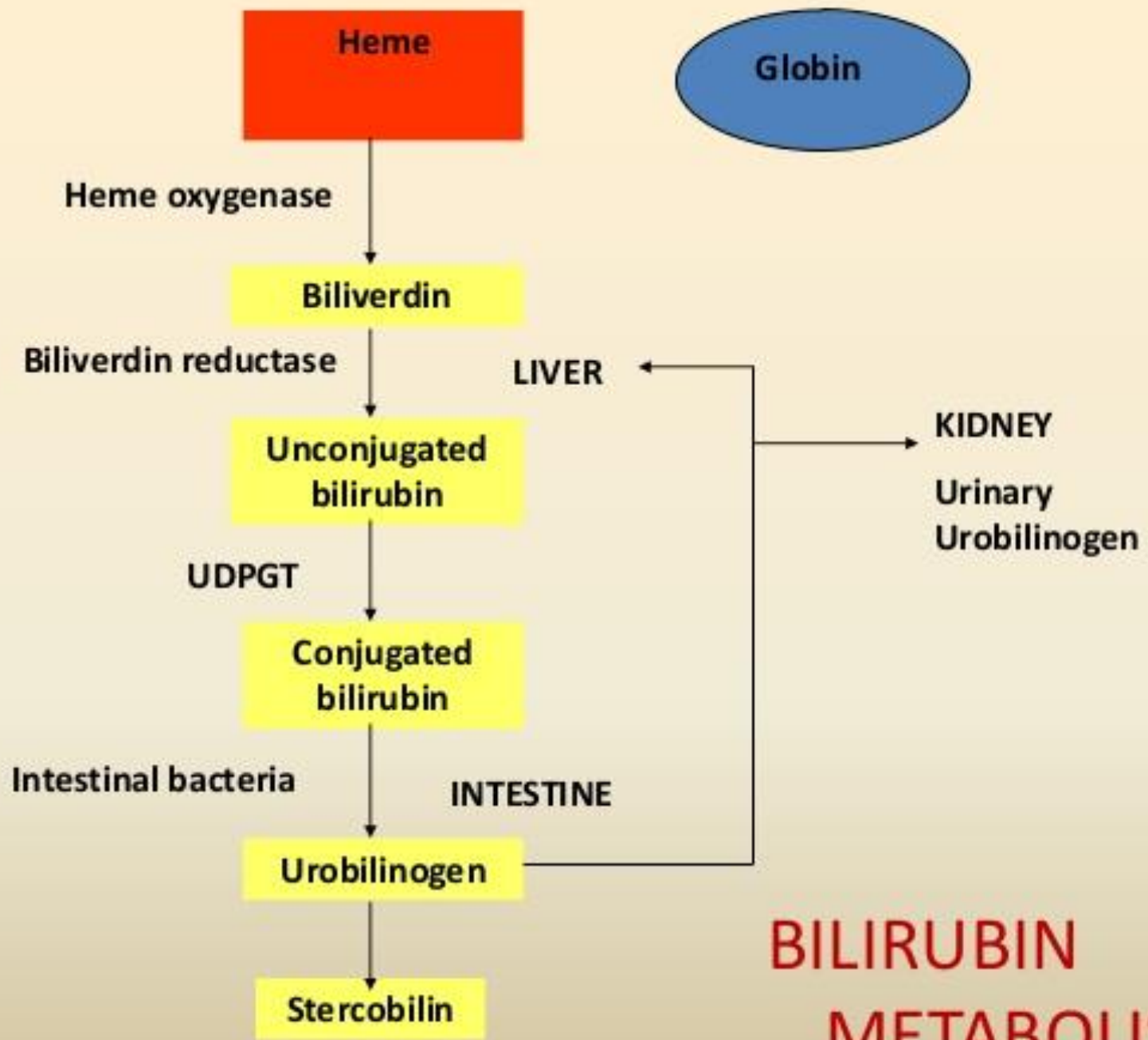
# The anatomy of Biliary tract



## *L02*

# *Bilirubin metabolism*

- Major metabolite of heme
- Heme is found in hemoglobin, myoglobin and cytochrome.
- Most of daily production (0.2 to 0.3g/dL) is derived from breakdown of senescent erythrocytes
- Rate of systemic bilirubin production is equal to the rates of hepatic uptakes, conjugation, and biliary excretion.



# BILIRUBIN METABOLISM

## *LO3: Pathophysiology of jaundice*

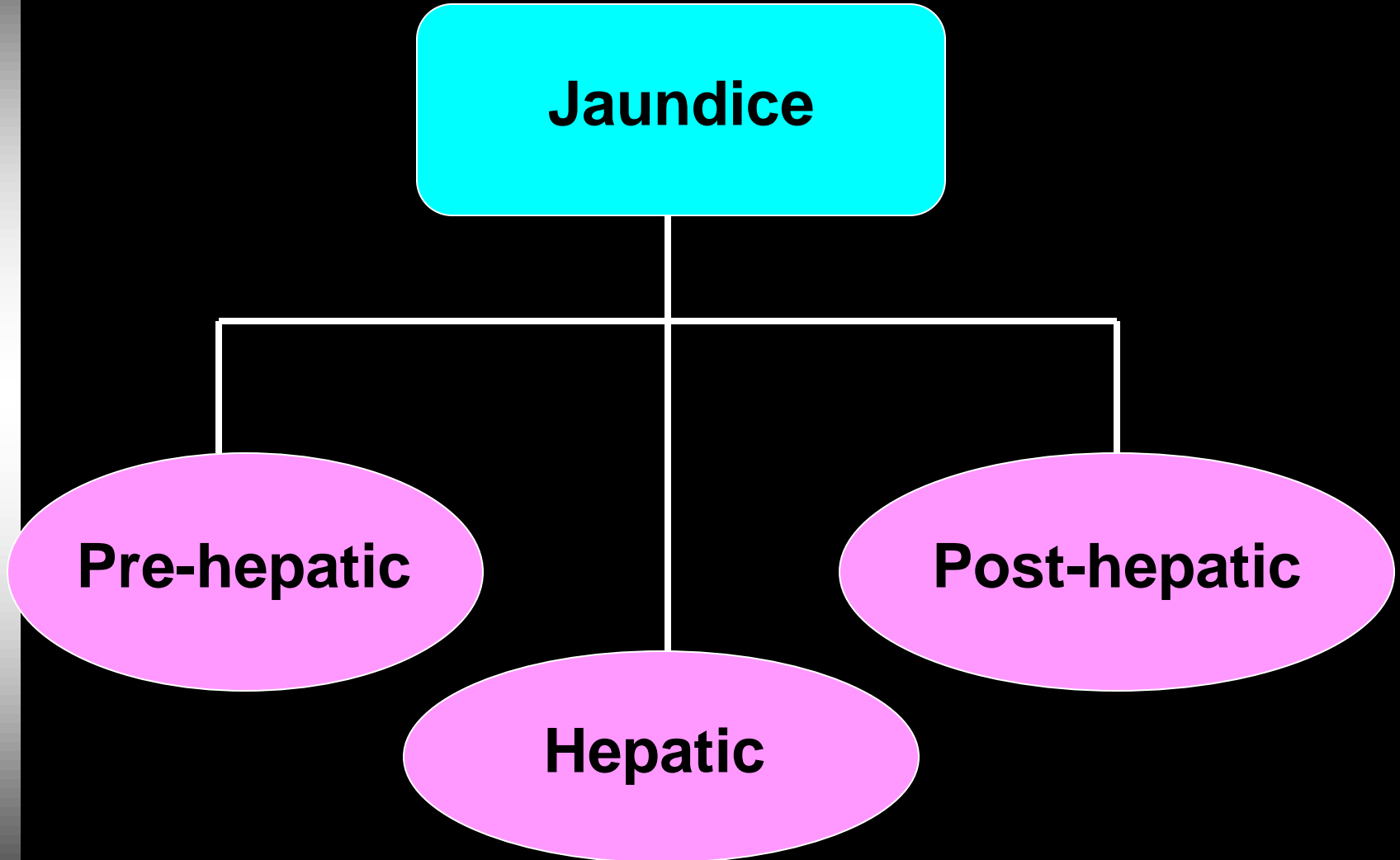
- Disturbance in bilirubin production or clearance.
- It is characterized by yellow color of white of the eyes (sclera) and skin
- Serum bilirubin levels rise above 2.0 to 2.5 mg/dL; level as high as 30-40mg/dL can occur with severe disease
- ↑ also called as hyperbilirubinaemia.

## *LO4: Mechanism of jaundice*

- Excessive production of bilirubin
- Reduced hepatic uptake
- Impaired conjugation
- Decreased hepato-cellular excretion
- Impaired bile flow (both intrahepatic and extrahepatic)



# *LO5: Aetiology of jaundice*



## *LO5: Pre-hepatic jaundice*

- Excessive production of bilirubin due to excessive destruction of red blood cells.
- This results in overproduction of bilirubin beyond the capacity of the liver to conjugate and excrete bilirubin.

# *LO5: Hepatic jaundice*

- Defective hepatic uptake
- Abnormal conjugation
- Hepatocellular damage

## *LO5: Defective hepatic uptake*

- **Unconjugated bilirubin in the plasma is carried into the liver by intracellular transport proteins.**
- **Absences of these proteins result in failure of bilirubin uptake, leading to unconjugated hyperbilirubinaemia (e.g. Gilbert Syndrome).**
- **Defective of blood supply to the liver also can cause abnormality of bilirubin metabolism**
- **These problems happen in congestive heart failure, pathway shunt due to surgery or congenital and adverse effect from drug intake.**

- Abnormal conjugation
  - Partial deficiency of glucoronyl transferase
  - drugs may interfere with this enzyme system  
e.g. Novobiocin
- Hepatocellular damage
  - Acute or chronic hepatocellular injury

# *LO5: Post hepatic jaundice*

- ❑ **Obstruction or impaired excretion of bilirubin**  
Failure of transfer of bilirubin glucuronide from the liver cell into the canaliculus (e.g Dubin-Johnson syndrome and Rotor's syndrome).
- ❑ **Obstruction at the intra-hepatic level**  
(cholestasis)
- ❑ **Obstruction to the flow of bile in the intralobular biliary canaliculi**

## ***L05:Post hepatic jaundice:***

- ❑ Intra-hepatic cholestasis occurs in:
  - in viral hepatitis
  - alcoholic liver disease
  - as a toxic reaction to drugs, including androgens (methyltestosterone), anabolic steroids, oral contraceptives, and phenothiazines
  - in benign familial cholestatic jaundice, a rare familial disease in which recurrent attacks of cholestatic jaundice represent the only abnormality

## ❑ **Extra-hepatic obstruction**

**Obstruction involve main hepatic ducts, the common hepatic duct, or common bile duct.**

**Complete obstructive jaundice prevents entry of bilirubin into the intestine, producing pale clay-colored or chalky stools**

**Absence of fecal and urinary urobilinogen  
dark brown (tea colored) urine containing bilirubin.**



# ***L06:Laboratory investigation***

- **FBC (hemolysis)**
- **Liver function test**
  - **Serum aminotransferase (AST,ALT)**
  - **Serology for hepatitis including HCAb, HBsAg, HBcAb**
  - **ALP: if elevated or if an obstruction is suspected, images of the bile ducts should be obtained.**
  - **GGT(gamma-glutamyl transferase)**
  - **Fractionated bilirubin**
  - **Prothrombin time (PT/INR), aPTT.**
  - **Albumin and Globulin**

## ***L06:***

- **U/S**
- **MRCP**