

# APPROCH TO JAUNDICE

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- JAUNDICE abnormal yellow discoloration of the skin, **sclera** and mucous membranes caused by Hyperbilirubinemia
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- First site where bilirubin deposits is sclera due presence of high amount of Elastin protein which has high affinity for bilirubin
- There is no absolute level at which jaundice is clinically detected but, in good light, most clinicians will recognise jaundice when bilirubin levels exceed  $50 \mu\text{mol/L}$  (3 mg/dl )

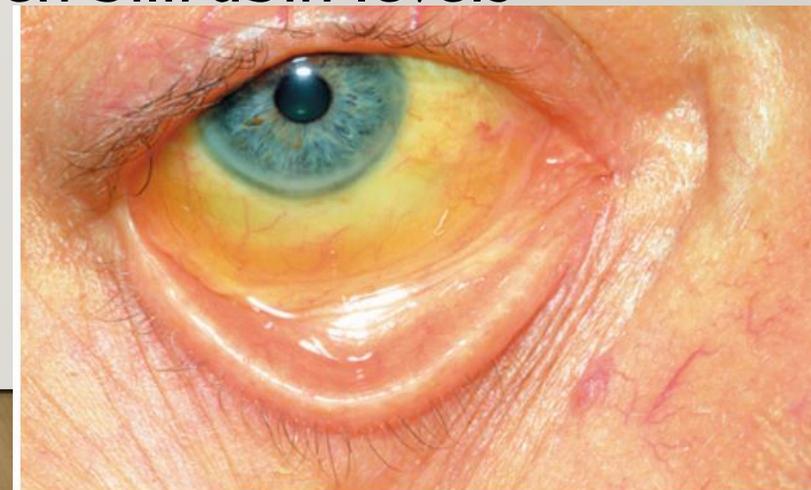
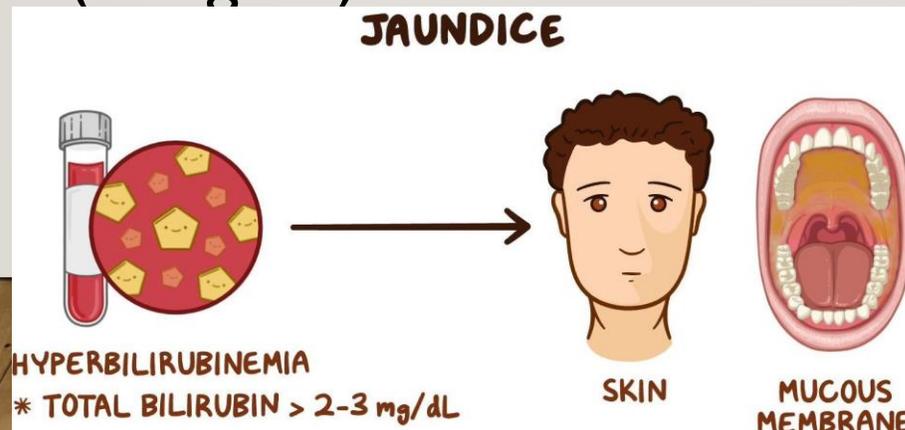
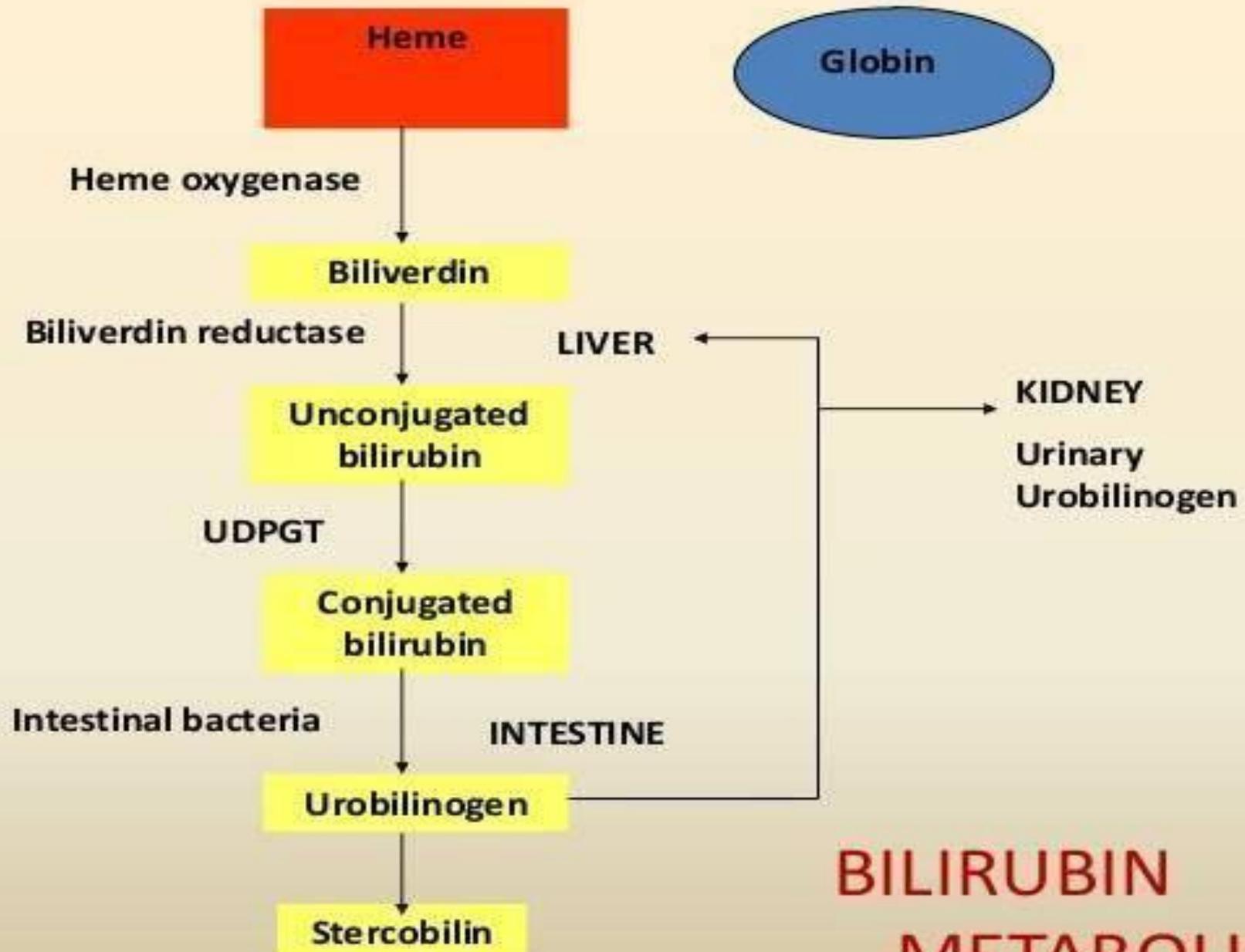
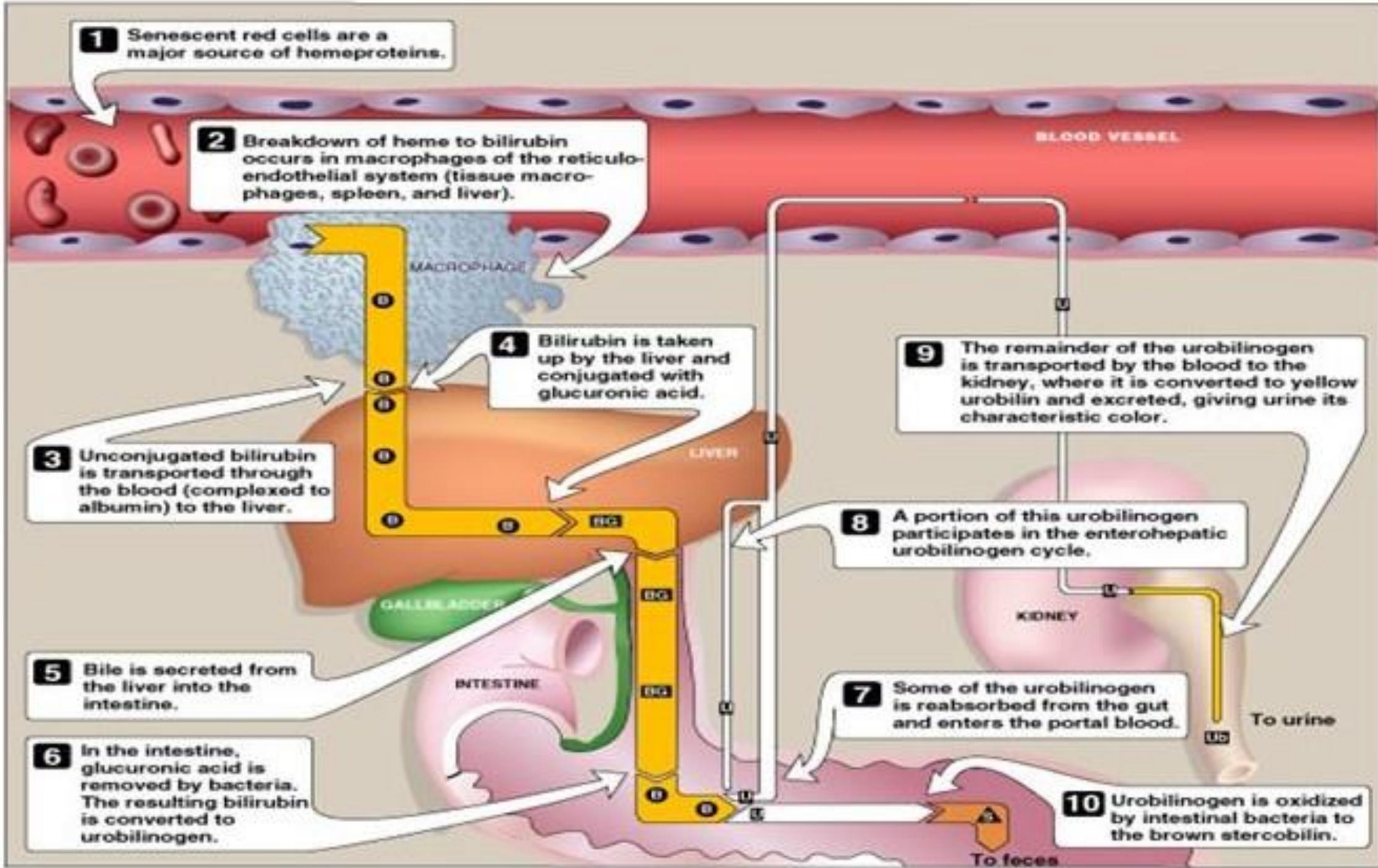


Fig. 6.8 Yellow sclera of jaundice.



**Globin**

# BILIRUBIN METABOLISM



# TYPES OF JAUNDICE

## PREHEPATIC

TRANSFUSION REACTIONS,  
SICKLE CELL ANEMIA,  
THALASSEMIA,  
AUTOIMMUNE  
DISEASE

## HEPATIC

HEPATITIS, CANCER,  
CIRRHOISIS, CONGENITAL  
DISORDERS, DRUGS

## POSTHEPATIC

GALLSTONES, INFLAMMATION,  
SCAR TISSUE, OR TUMORS  
BLOCK THE FLOW OF BILE  
INTO THE INTESTINES

## PRE HEPATIC

Excessive amount of unconjugated bilirubin is presented to the liver due to excessive hemolysis, Gilbert syndrome  
+anemic pallor (lemon jaundice)

Elevated unconjugated bilirubin in serum

- Stool : normal

- Urine : normal

(pale)

## HEPATIC

Impaired cellular uptake, defective conjugation or abnormal secretion of bilirubin by the liver cell

Caused by liver diseases

Mixed conjugated and unconjugated bilirubin is elevated.

-stool : ~~normal (this is stercobilin)~~

-Urine : dark (elevated conjugated bilirubin CB)

## POST HEPATIC

Impaired excretion due to mechanical obstruction of bile flow to intestine  
-Also called obstructive / surgical jaundice  
++itching

Elevated conjugated bilirubin in serum

-stool : pale (no stercobilin)

-Urine : dark (elevated CB)

- Prehepatic Jaundice

- (Uncounjugated Hyperbilirubinemia)

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- Causes:

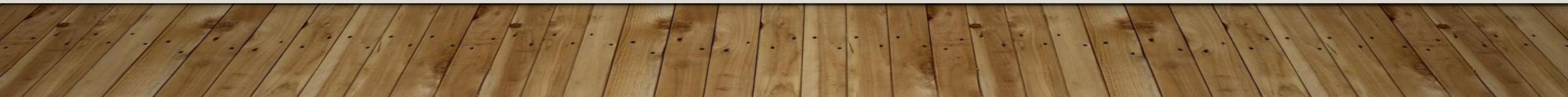
- 1-**Hemolytic Anemia**: hemolysis of RBCs release Heme protein which eventually converted to UGB .....such as Sickle cell disease & Hereditary spherocytosis & G6PD Deficiency

- 2-**Gilbert Syndrome**: the most common hereditary cause of increased bilirubin.

- -Caused by elevated levels of unconjugated bilirubin in the bloodstream.

- -The cause of this hyperbilirubinemia is the reduced activity(70%-80%) of the glucuronyl transferase, which conjugates bilirubin and some other lipophilic molecules.

- The colour of stool & urine are Normal



# • Hepatic Jaundice

- Hyperbilirubinemia (both CB & UCB ) Due to Hepatocellular disease that cause a reduction n in counjugation and secretion of bilirubin.
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- Parenchymal liver disease detected by elevation of liver enzymes ( AST , ALT)

## • Causes →

- Impaired or absent hepatic conjugation of bilirubin -

- **Acquired disorders:**

- - Hepatocellular necrosis
- - Hepatitis, Cirrhosis, Drug-related –
- - Infiltrative: TB,
- - Toxins
- Hepatic crisis in sickle cell disease

**Stool is pale in colour & Urine is Dark**

Acute Liver Injury	Chronic Liver Injury
Typical symptoms	Chronic and insidious
ALT & AST	↑ ALT & AST
Albumin	↓ Albumin
Cholelithiasis	↑ Cholelithiasis
Cholestasis	↑ Cholestasis
Coagulopathy	↑ Coagulopathy
Encephalopathy	↑ Encephalopathy
Renal dysfunction	↑ Renal dysfunction
Systemic hypotension	↑ Systemic hypotension
Acute liver failure	↑ Acute liver failure

# • PostHepatic Jaundice (Obstructive)

- Hyperbilirubinemia (CB)

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## • Intrahepatic

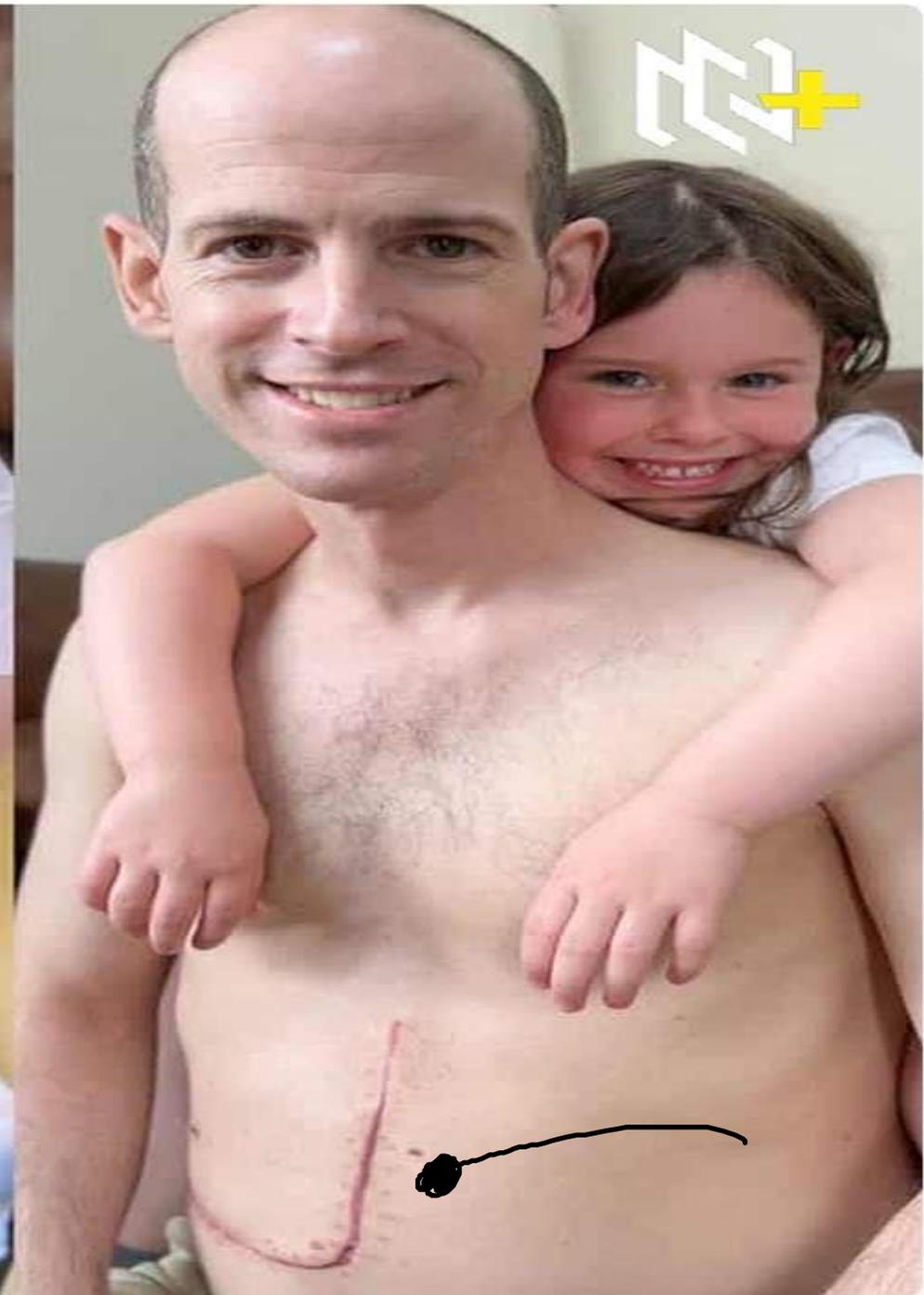
- - Blockage of Bile Canaliculi
- - Dubin-Johnson syndrome ( Mild autosomal resseccive disease characterized by mild impairment in biliary secretion of conjugated bilirubin)
- - Hepatitis-viral, chemical(carbon tertachloride →toxic to the liver )
- - Infiltrative tumors

## • Extrahepatic

- - Obstructive of bile ducts by tumors, CBD or CHD stone and Stenosis
- - Acute and chronic pancreatitis
- - Parasitic infections as Ascaris lumbricoides and liver Flukes

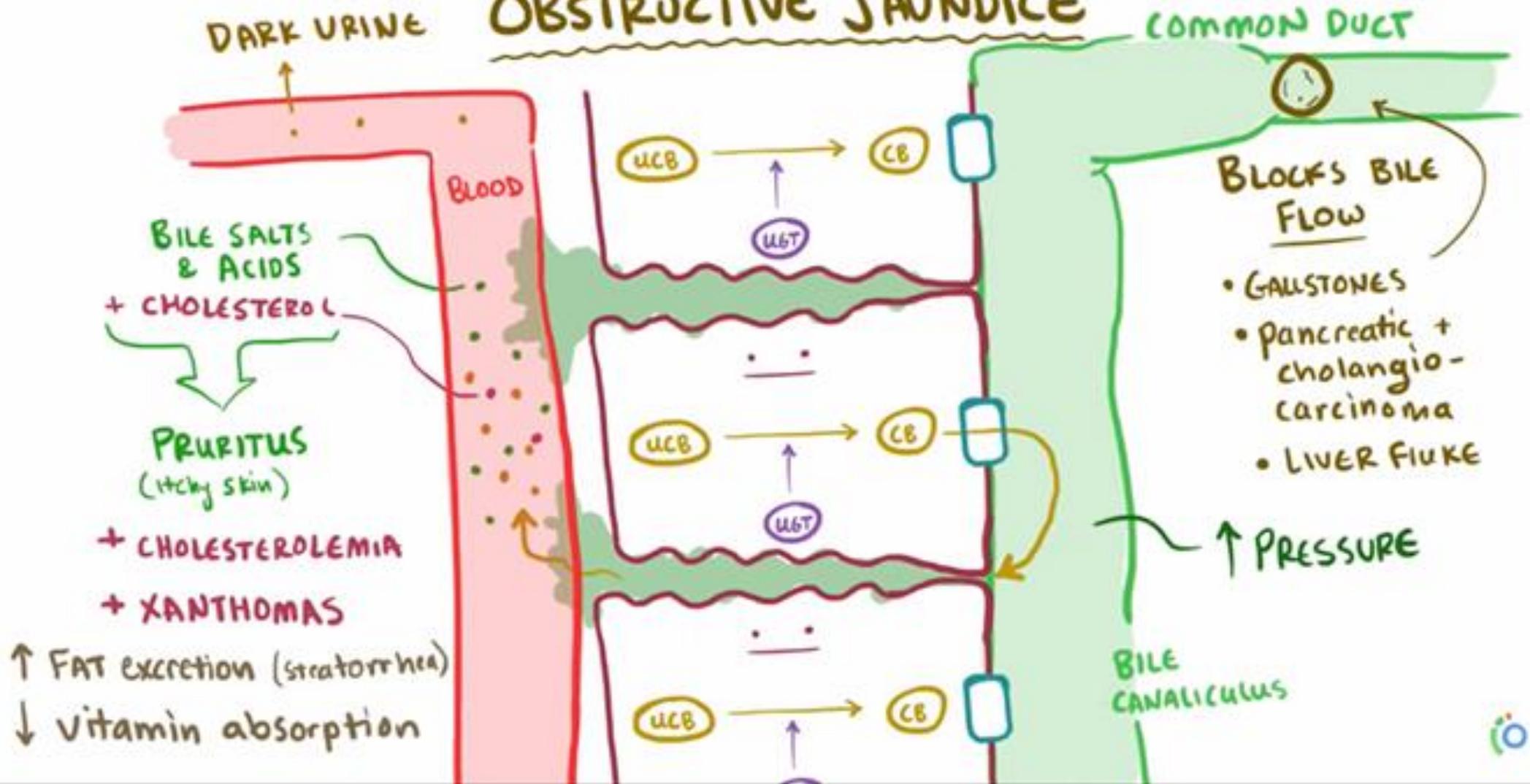
Plasma bilirubin is conjugated, and other biliary metabolites, such as bile acids accumulate in the plasma → will cause skin itching

The colour of Stool is pale & Urine is Dark



JAUNDICE =  $\boxed{\uparrow \text{CB}}$   $\uparrow \text{UCB}$   $\uparrow \text{BOTH}$

## OBSTRUCTIVE JAUNDICE



# Neonatal Jaundice(Kernicterus)

Common, particularly in premature infants

- Transient (resolves in the first 10 days), due to immaturity of the enzymes involved in bilirubin conjugation
- High levels of unconjugated bilirubin are toxic to the newborn (as it lipid soluble)
- due to its hydrophobicity it can cross the blood-brain barrier and cause a type of mental retardation known as kernicterus
- If bilirubin levels are judged to be too high, then phototherapy with UV light is used to convert it to a water soluble, non-toxic form
- If necessary, exchange blood transfusion is used to remove excess bilirubin
- Phenobarbital is oftentimes administered to Mom prior to an induced labor of a premature infant – crosses the placenta and induces the synthesis of UDP glucuronyl transferase
- Jaundice within the first 24 hrs of life or which takes longer than 10 days to resolve is usually pathological and needs to be further investigated

- Hypercarotonaemia

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- Hypercarotonaemia occurs due to excessive ingestion of carotene-containing vegetables or in situations of impaired metabolism such as hypothyroidism.
  - A yellowish discoloration is seen on the face, palms and soles **but not the sclera or conjunctiva, and this distinguishes it from jaundice**



## 6.6 Common causes of jaundice

### Increased bilirubin production

- Haemolysis (unconjugated hyperbilirubinaemia)

### Impaired bilirubin excretion

- Congenital:
  - Gilbert's syndrome (unconjugated)
- Hepatocellular:
  - Viral hepatitis
  - Cirrhosis
  - Drugs
  - Autoimmune hepatitis
- Intrahepatic cholestasis:
  - Drugs
  - Primary biliary cirrhosis
- Extrahepatic cholestasis:
  - Gallstones
  - Cancer: pancreas, cholangiocarcinoma

# HISTORY TAKING

- Look at age of patient .....
- Young: consider viral hepatitis due to tattoos, intravenous drug use or risky sexual activity
- Middle-aged/elderly: may focus more on alcohol history/?malignancy
- Establish time frame:
- **Slowly developed over time (months-years):** Think alcohol excess, obesity, Hepatitis B or C, malignancy .
- **Rapid onset (weeks):** Acute viral hepatitis (Hepatitis A or E), autoimmune disorders .



# HISTORY TAKING

- Associated symptoms:
  - **Dark urine/pale stools:** If YES think about Hepatic/obstructive jaundice (e.g. due to gallstones, pancreatic malignancy)
  - **Itching** (in obstructive jaundice most commonly- deposition of bile acids in skin)
  - **Abdominal pain:** If associated with fever and general malaise, consider Ascending Cholangitis
- **Any weight loss, fatigue, change in bowel habit** (ynangilam fo evitseggus)

# **HISTORY TAKING**

- **Sexual history, IV drug use, get any tattoos) all are risk factors for Hepatitis B & C)**
- **Alcoholic history**
- **Previous blood transfusions**
  
- **Recent travel: in general, developing countries tend to have higher incidence of Hep A/E**

# HISTORY TAKING

- Past Medical History

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- Gallstones
- Previous malignancy (especially bowel, pancreatic)
- Previous history of jaundice (may have chronic active viral hepatitis, Gilbert's etc)
- Previous history of cholecystectomy (may have retained stone in Common bile duct )
- History of autoimmune disease (Vitiligo, type 1 diabetes, thyroid disease) may point towards autoimmune hepatitis, primary biliary cirrhosis



- For Drug History →

**Ask about allergies**

Jaundice: hepatitis

Paracetamol (overdose)

Pyrazinamide

Rifampicin

Isoniazid

13

Jaundice: cholestatic

Flucloxacillin

Chlorpromazine

Co-amoxiclav

# HISTORY TAKING

- Family History

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- **Autoimmune disease**

- **Social History**

- Occupation:

- **Sewage workers: Hepatitis A & E, Leptospirosis**

- **Health care workers: needle stick injury**

- Smoking history(malignancy)

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- **Physical Examination:**
- **Prehepatic (haemolytic):** Often the jaundice is not intense, with only a mild lemon tinge. Anaemia. Splenomegaly.
- **Hepatic:**

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- Tender liver in hepatitis.
- Signs of liver failure: spider naevi, palmar erythema, leuconychia, clubbing, gynaecomastia, testicular atrophy, ascites, peripheral oedema, bruising, Dupuytren's contracture, caput medusae.
- **Cholestatic:**
- Hepatomegaly – usually smooth liver with 'sharp' edge.
- Palpable gall bladder
- Epigastric mass, e.g. carcinoma of the pancreas. carcinoma of the stomach and carcinoma of the colon with secondary deposits in the porta hepatis.



- **Laboratory Investigations:**

- CBC →

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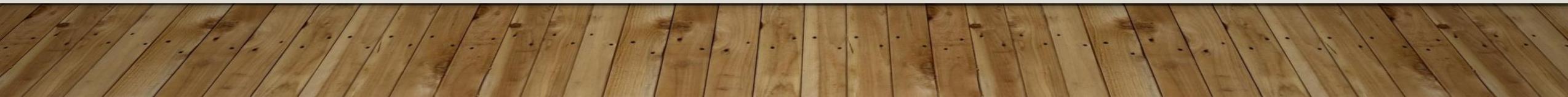
- **Hb ↓** malignancy, haemolysis. **WBCs ↑** infection, e.g. hepatitis, cholangitis. **ESR ↑** infection, malignancy. **Blood film** – spherocytosis, Sickle cells

- Reticulocyte count Increase in Haemolysis

- Viral antibodies Hepatitis A, hepatitis B, hepatitis C, CMV, EBV.

- Ultrasound Gallstones.

- Liver biopsy Hepatocellular disease. Carcinoma



# • Treatment and Medication Options for Jaundice

## • Infants

- .If a baby has moderate or severe jaundice, the following treatment options are required. ...
- Phototherapy nac ti taht os niks eht ni niburilib nwod kaerb pleh taht sthgil laiceps .detercxe eb
- Exchange Transfusion’nseod ecidnuaj ereves nehwsnoisacco erar nO t respond to earlier treatments, the baby may require this procedures Here, small amounts of blood are repeatedly withdrawn and then replaced with donor blood.This process helps dilute bilirubin .



## IN ADULT

- The underlying disorder and any problems it causes are treated as needed. If jaundice is due to acute viral hepatitis , on seriuqer flesti eacidnuaj sevorpmi revil eht fo noitidnoc eht sa ,tnemtaert )snrobwen ni ekilnu) stluda ni tnemtaert
- For itching, cholestyramine
- For blocked bile duct, a procedure to open it

A close-up photograph of Grumpy Cat, a brown and white cat with a grumpy expression. The cat is looking directly at the camera with a frowny face. The background is a plain, light-colored wall.

**DO YOU HAVE  
ANY QUESTION?**

**DON'T ASK ME**