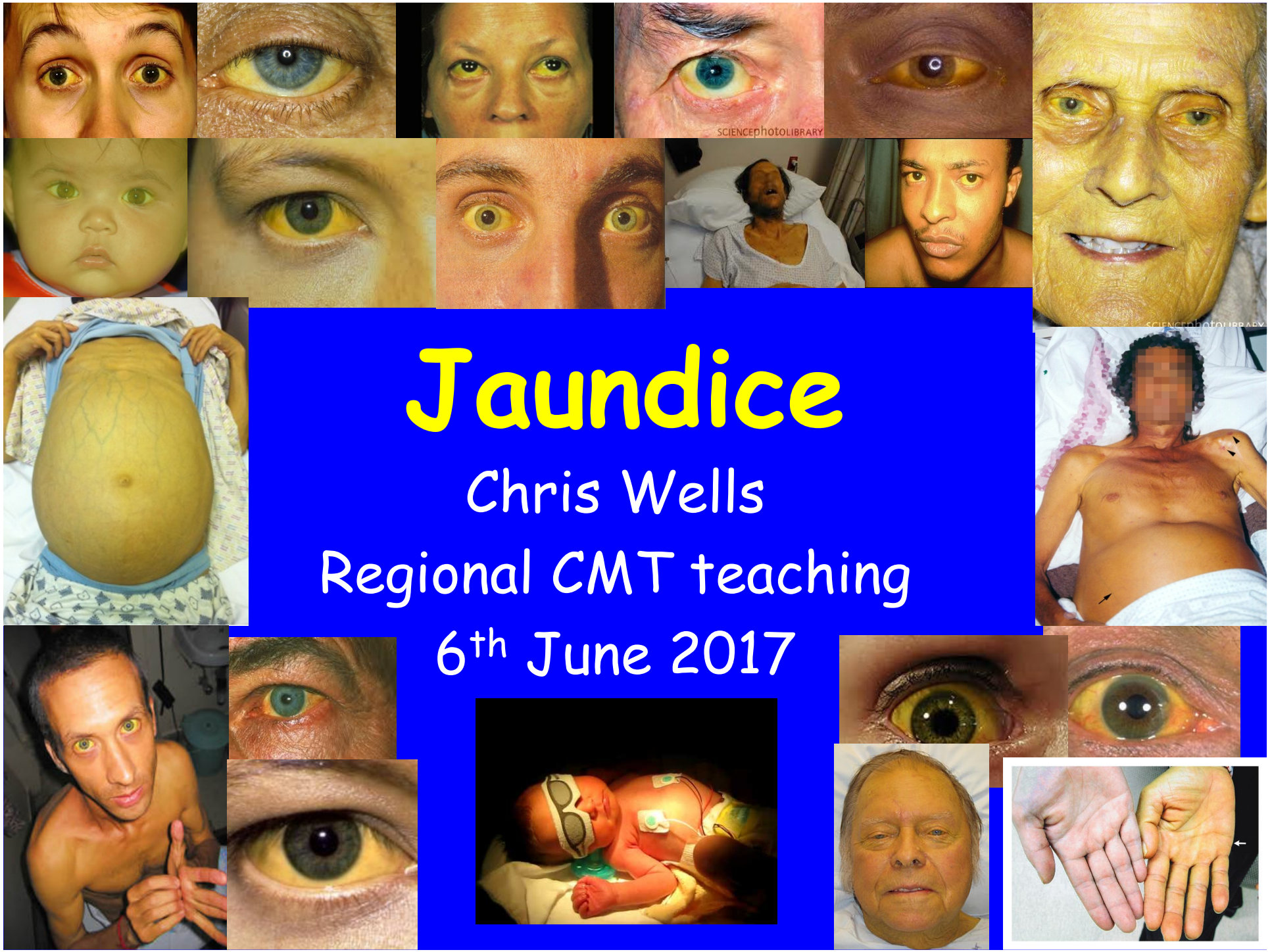


# Jaundice

Chris Wells

Regional CMT teaching

6th June 2017

# By the end you will

- Have a systematic approach to the patient with jaundice
- Be able to diagnose the cause of jaundice
- Have a framework for managing patients with jaundice

# Talk Outline

- Review of Curriculum outcomes
- Quiz
- Jaundice classification
- Cases
- Quiz answers

# Syllabus - knowledge

- Recall the pathophysiology of jaundice in terms of pre-hepatic, hepatic, and post-hepatic causes.
- Recall causes for each category of jaundice with associated risk factors
- Recall basic investigations to establish aetiology (see system specific competencies)

# Syllabus - skills

- Take a thorough history and examination to arrive at a valid differential diagnosis
- Recognise the presence of chronic liver disease or fulminant liver failure
- Interpret results of basic investigations to establish aetiology
- Recognise complications of jaundice
- Recognise and initially manage complicating factors: coagulopathy, sepsis, GI bleed, alcohol withdrawal, electrolyte disturbance

# Syllabus - behaviours

- Exhibit non-judgmental attitudes to patients with a history of alcoholism or substance abuse
- Consult seniors and gastroenterologists promptly when indicated
- Contribute to the patient's understanding of their illness
- Recognise the importance of a multi-disciplinary approach

# Jaundice Quiz

1. At what serum concentration is hyperbilirubinaemia seen as jaundice?
2. Gilberts syndrome increases conjugated bilirubin T/F
3. Hepatitis C is the main cause of acute viral hepatitis T/F
4. What is the commonest cause of cirrhosis worldwide?

# Quiz II

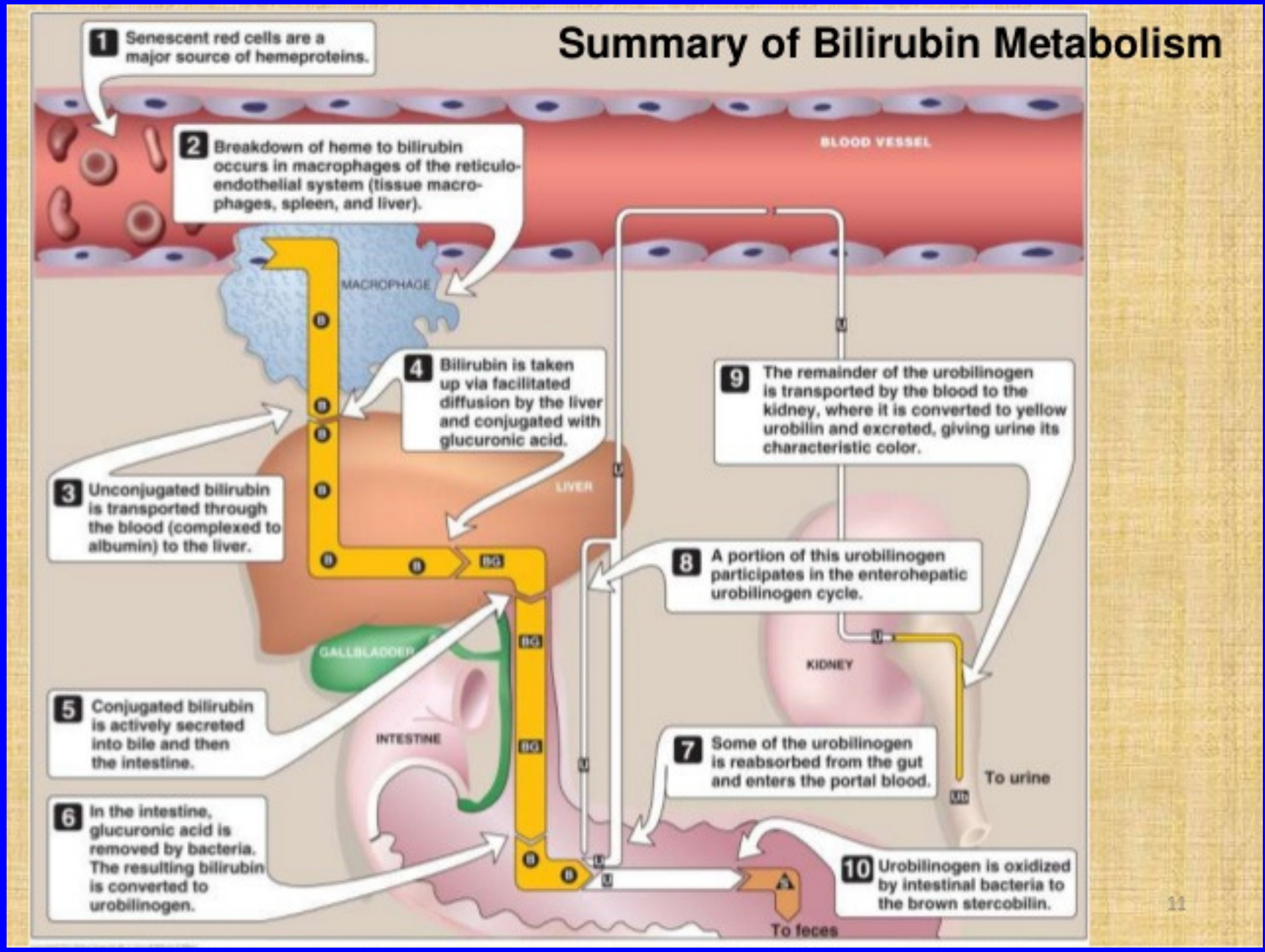
5. Which duct needs to be blocked to cause post-hepatic jaundice?
6. Which auto-antibody is associated with primary biliary cirrhosis?
7. What binds to N-acetyl-p-benzoqinonemine (NAPQI) to detoxify it?

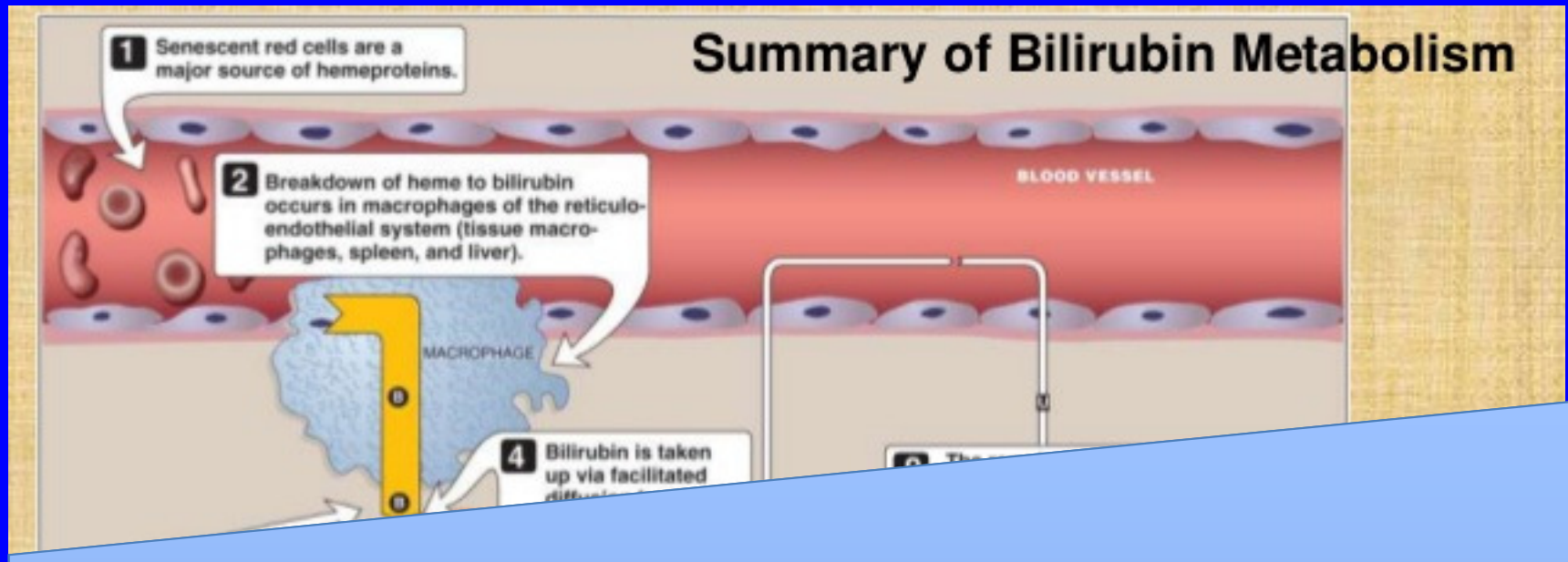
# Quiz III

8. In obstructive jaundice if the bilirubin is 350mcmol/l what is the likely aetiology?
9. What does the Greek word "icterus" translate into?
10. Where does bilirubin come from?

# Classification of Jaundice

- Pre-Hepatic
- Hepatic
- Post-Hepatic


Summary of Bilirubin Metabolism
1 Senescent red cells are a major source of hemeproteins.
2 Breakdown of heme to bilirubin occurs in macrophages of the reticulo-endothelial system (tissue macrophages, spleen, and liver).
BLOOD VESSEL
MACROPHAGE
3 Unconjugated bilirubin is transported through the blood (complexed to albumin) to the liver.
4 Bilirubin is taken up via facilitated diffusion by the liver and conjugated with glucuronic acid.
LIVER
BG
GALLBLADDER
5 Conjugated bilirubin is actively secreted into bile and then the intestine.
INTESTINE
6 In the intestine, glucuronic acid is removed by bacteria. The resulting bilirubin is converted to urobilinogen.
7 Some of the urobilinogen is reabsorbed from the gut and enters the portal blood.
8 A portion of this urobilinogen participates in the enterohepatic urobilinogen cycle.
9 The remainder of the urobilinogen is transported by the blood to the kidney, where it is converted to yellow urobilin and excreted, giving urine its characteristic color.
KIDNEY
To urine
10 Urobilinogen is oxidized by intestinal bacteria to the brown stercobilin.
To feces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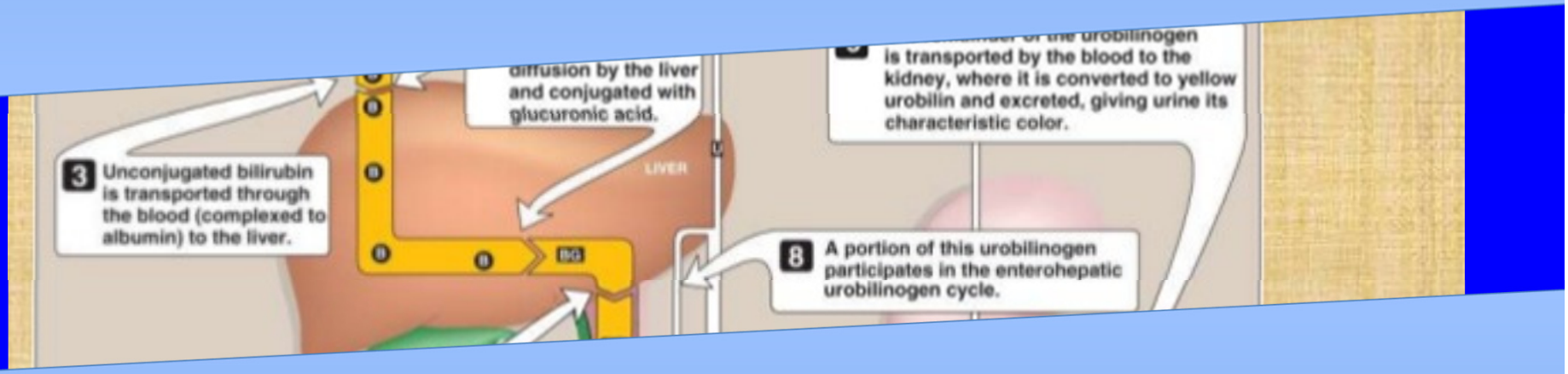
BLOOD VESSEL
MACROPHAGE
4 Bilirubin is taken up via facilitated

# Pre-Hepatic

# Causes of Pre-hepatic jaundice

- Haemolysis
  - Thalassaemia, Sickle cell, G6PDD, Spherocytosis, Autoimmune, Drugs
- Reabsorption of haematoma
- Dyserythropoiesis eg porphyria
- Impaired uptake into liver
  - Gilberts
  - Crigler-Najjar, Rotor, Dubin-Johnson

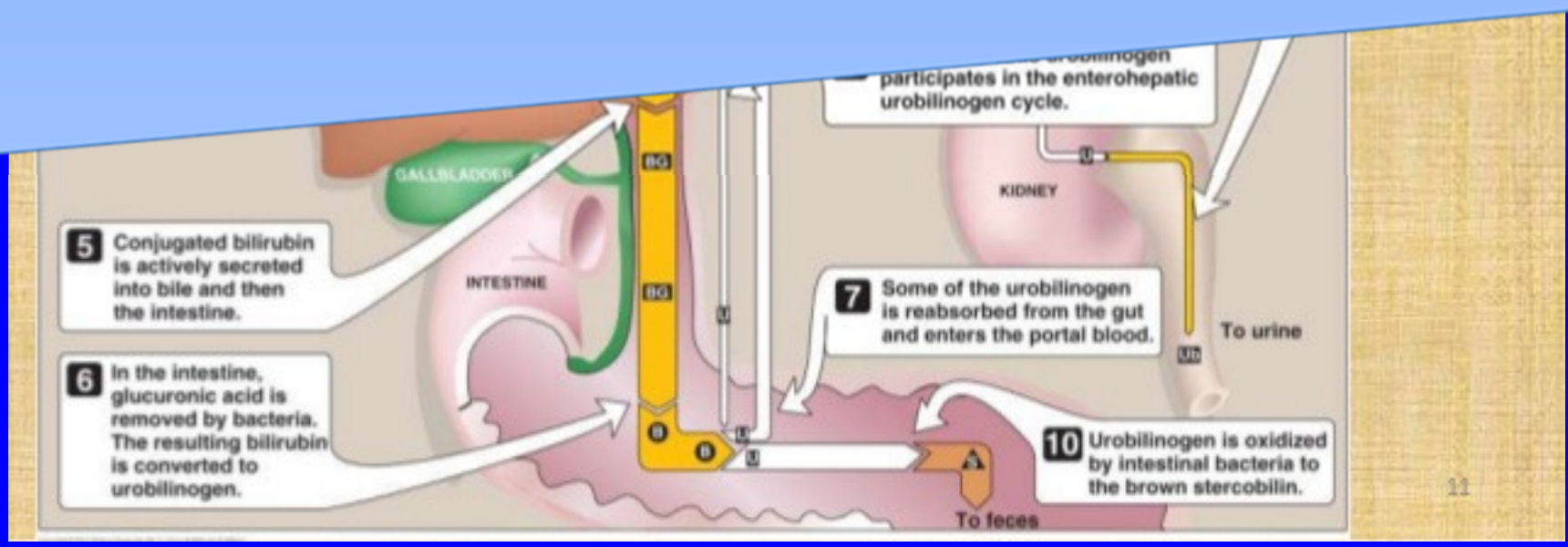
# Hepatic


diffusion by the liver and conjugated with glucuronic acid.
3 Unconjugated bilirubin is transported through the blood (complexed to albumin) to the liver.
LIVER
BG
is transported by the blood to the kidney, where it is converted to yellow urobilin and excreted, giving urine its characteristic color.
8 A portion of this urobilinogen participates in the enterohepatic urobilinogen cycle.

# Hepatic

- Viral Hepatitis – Hep A, B, E, CMV, EBV
- Alcoholic Hepatitis
- Primary Biliary Cirrhosis
- Cholestasis – drugs (fluclox, co-amoxiclav), TPN
- Sepsis
- Cirrhosis
- Pregnancy

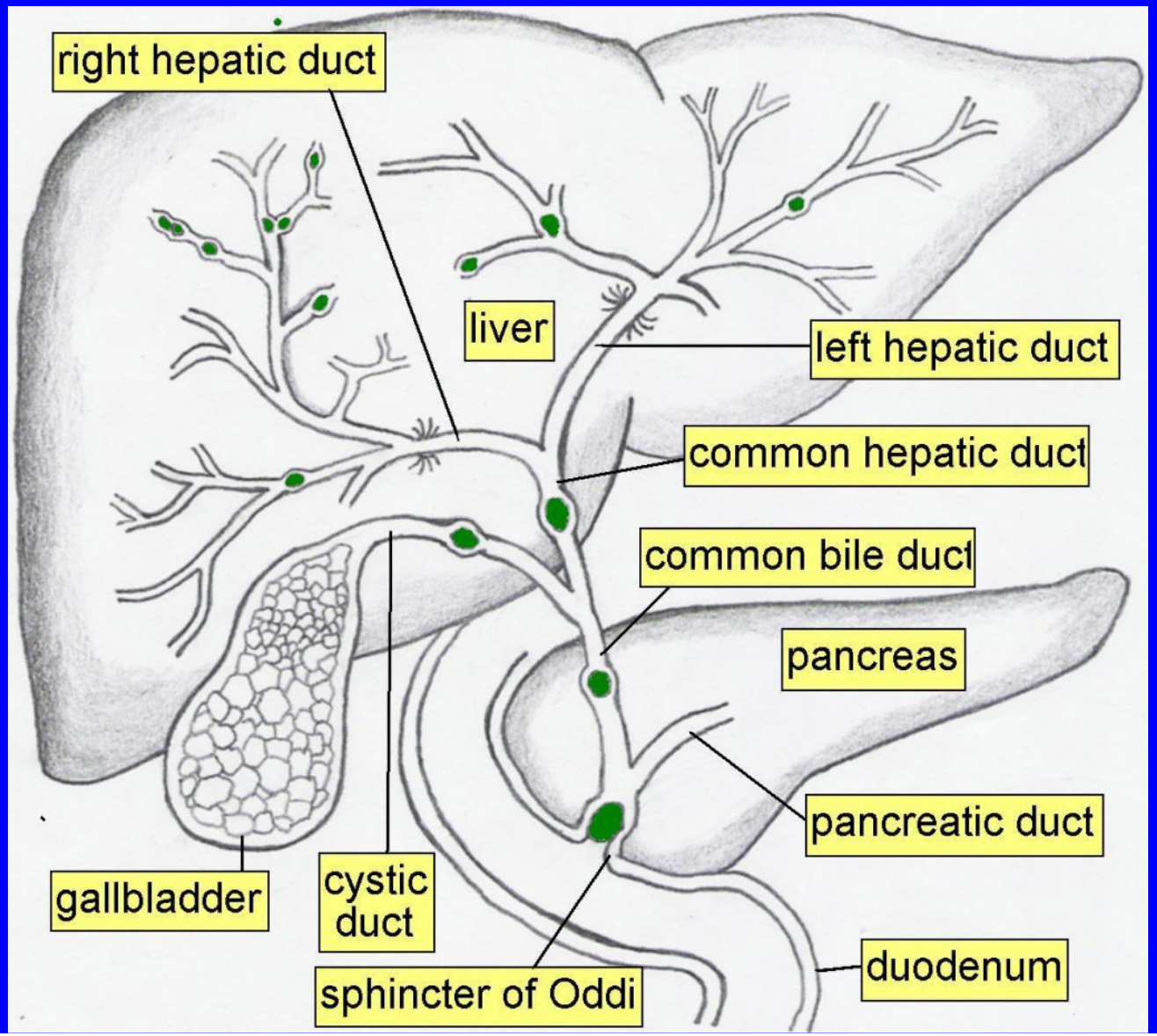
# Post-Hepatic



# Post-Hepatic

- Choledocholithiasis
- Intrinsic (cholangiocarcinoma) and extrinsic (HOP) cancers
- Acute/Chronic pancreatitis
- Benign strictures
- Primary Sclerosing Cholangitis
- Certain parasitic infections (liver flukes)

# Biliary Tree anatomy



# In pairs

Discuss how you would differentiate between pre-hepatic, hepatic and post hepatic causes of jaundice??

# Pre-hepatic

- Clinical
  - Well
  - Family History
  - Splenomegaly (think haemolysis)
- Labs
  - Isolated raised bilirubin (usually unconjugated - indirect)
  - Coombs test

# Hepatic

- Clinical
  - Stigmata of CLD
  - Encephalopathic
  - Risk factors
- Labs
  - ALT
  - Albumin
  - Clotting
  - Low platelets
- AUSS
  - Coarse liver
  - Large spleen

# Post-hepatic

- Bloods
  - AP
- Imaging
  - AUSS
  - MRCP
  - CT
  - ERCP

# Case 1

- 22 F
- Jaundice, abdo pain, nausea
- 3 days after argument with boyfriend

# Case 1 results

- Bili = 234
- PT = 62
- Albumin = 29
- Lactate = 4.5

- DIAGNOSIS??
- MANAGEMENT??

# Case 2

- 21M dental student
- Develops jaundice after drinking with rugby team
- Or when he has a cold
- LFTS Normal apart from bilirubin of 32

- DIAGNOSIS??
  MANAGEMENT??

# Case 3

- 38F with jaundice, otherwise well
- Had cellulitis 3 months ago for which she was given antibiotics

- Bilirubin 342, AP 650, ALT 140, other bloods normal
- AUSS normal

- DIAGNOSIS?? MANAGEMENT??

# Case 4

- 64M with painless jaundice
- Bilirubin 342, AP 650, ALT 140
- PT 21

- DIAGNOSIS???
- WHAT INVESTIGATIONS??

# Case 5

- 56F presents with ascites, jaundice
- Bilirubin 200, PT 24, albumin 21
- DIAGNOSIS??
  DIFFERENTIAL??

# Jaundice Quiz

1. At what serum concentration is hyperbilirubinaemia seen as jaundice? 34-50mcmol/l
2. Gilberts syndrome increases conjugated bilirubin False
3. Hepatitis C is the main cause of acute viral hepatitis False
4. What is the commonest cause of cirrhosis worldwide? Hepatitis B

# Quiz II

5. Which duct needs to be blocked to cause post-hepatic jaundice? Common bile duct
6. Which auto-antibody is associated with primary biliary cirrhosis? Anti-mitochondrial antibody (M2)
7. What binds to N-acetyl-p-benzoqinonemine (NAPQI) to detoxify it? Glutathione

# Quiz III

8. In obstructive jaundice if the bilirubin is 350mcmol/l what is the likely aetiology? Head of Pancreas cancer
9. What does the Greek word "icterus" translate into? Yellow/Green Bird – possibly the Oriole
10. Where does bilirubin come from? 80% haem breakdown, 20% ineffective Hb synthesis

# The Oriole….

# By the end you will

- Have a systematic approach to the patient with jaundice
- Be able to diagnose the cause of jaundice
- Have a framework for managing patients with jaundice