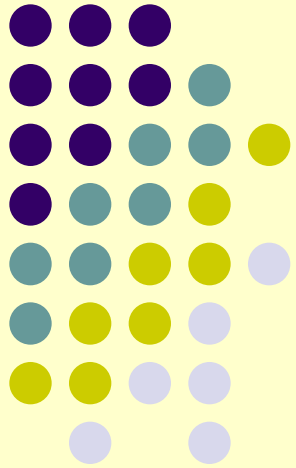
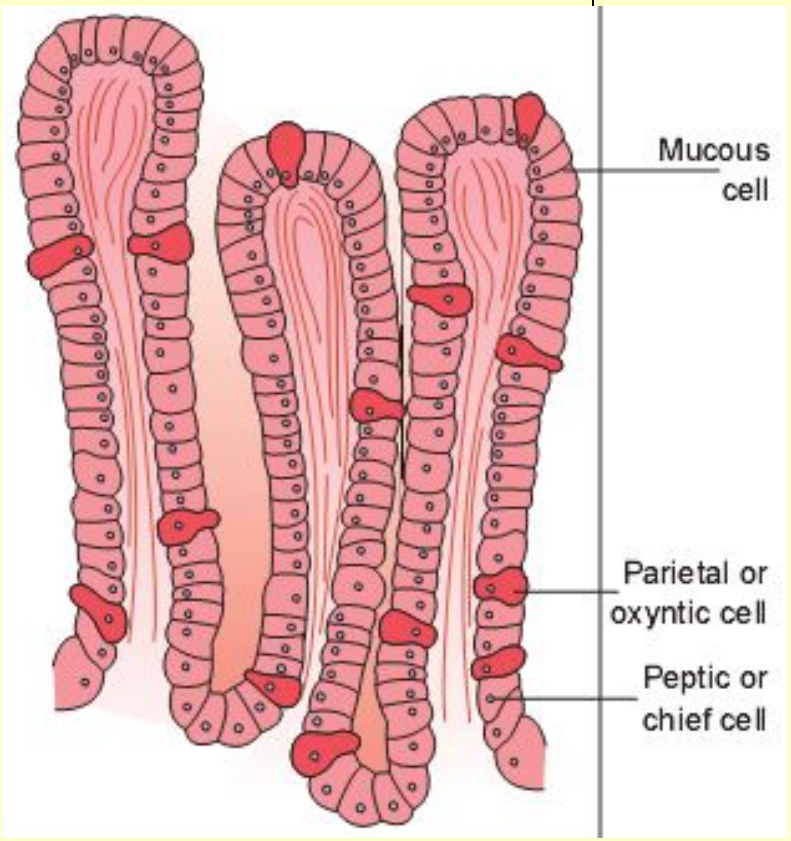
GIT disorders



Gastric mucosal barrier

- tight cellular junctions
- presence of a protective mucus layer
- bicarbonate ions (HCO_3^-) secretion
- synthesis of prostaglandins



Acute gastritis

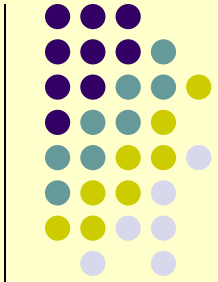
Causes

- Diet and personal habits (excessive alcohol, smoking, malnutrition).
- Infections:
  - bacterial - Helicobacter pylori, diphtheria, salmonellosis, staphylococcal food poisoning;
  - viral - viral hepatitis, influenza.
- Drugs (NSAIDs, cortisone).
- Chemical and physical agents.
- Severe stress.

Gastritis pathogenesis

- **Reduced blood flow** □mucosal hypo-perfusion□ ischemia.
- **Increased acid secretion** (in H.pylori infection)□ damage to epithelial barrier.
- **Decreased production of bicarbonates.**

Types of chronic gastritis



Type A Gastritis (Autoimmune gastritis).

- antibodies against parietal cells and intrinsic factor.
- other autoimmune diseases .
- gastric atrophy
- hypo- or achlorhydria.

Type B Gastritis (Helicobacter pylori-related).

- excessive secretion of acid (hypersecretory gastritis)
- associated peptic ulcer

Types of chronic gastritis

Type AB Gastritis (environmental)

- gastric atrophy
- caused by environmental factors.

Type C Gastritis (Chemical)

- due to reflux of alkaline duodenal contents, pancreatic secretions, and bile into the stomach.
- in persons after GIT surgery, with gastric ulcer, gallbladder diseases.

Peptic ulcer disease

Ethiology:

- H pylori infection
- NSAIDs (aspirin - the most ulcerogenic)
- Lifestyle factors
- Severe physiologic stress
- Genetic factors (hereditary predisposition)

Stress ulceration

High level of glucocorticoids and adrenaline (stress hormones) causes:

- □ mucus secretion (glucocorticoids)
- □ regeneration of gastric epithelial cells (glucocorticoids)
- □ microcirculation and ischemia of mucosal tunic (glucocorticoids, adrenaline)
  - other reasons of ischemia (collapse, shock, acute blood loss, spasm of blood vessels)
- □ tonus of the vagal nerve □ □ HCl and pepsin secretion.

Clinical manifestations

- affection of one or all layers of stomach
- remissions and exacerbation
- healing with scar formation
- stomach discomfort and pain.
  - periodicity of pain (on empty stomach).
  - recurrence of pain.
  - pain is relieved by food or antacids.

Complications

Hemorrhage

- bleeding from granulation tissue
- erosion of an ulcer into an artery or vein

Hematemesis or melena.

Acute hemorrhage – signs of circulatory shock depending on the amount of blood loss.

Complications

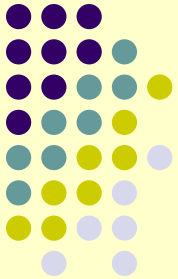
Obstruction

- edema, spasm or contraction of scar.
- epigastric fullness, vomiting of undigested food.

Perforation

- GI contents enter the peritoneum (peritonitis),
- ulcer penetrate adjacent structures (pancreas),
- severe pain radiating into the back.

Therapy principles



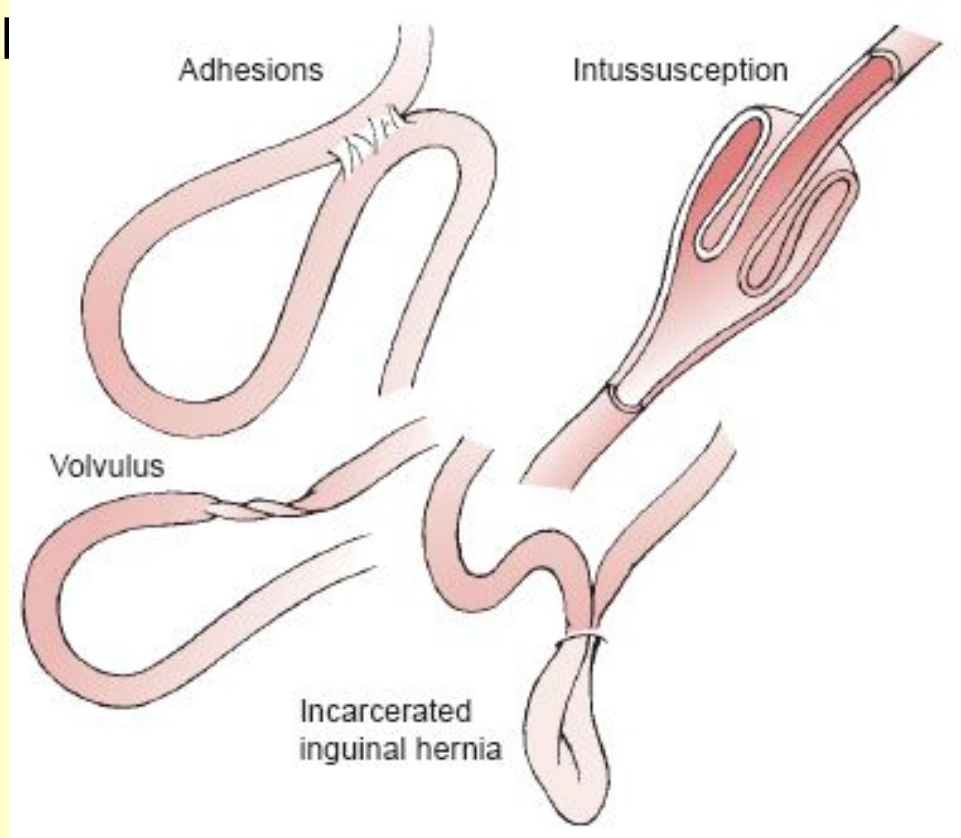
- Eradication of Helicobacter pylori with antibiotics
- Inhibition of gastric secretion
  - H2 histamine receptor antagonists (cimetidine, ranitidine)
  - Prostaglandin E1 analogues (misoprostol)
- Surgical management
  - highly selective vagotomy in order to inhibit gastric secretion

Intestinal obstruction

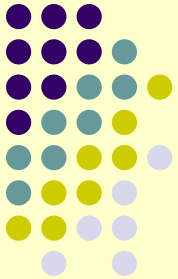
Mechanical obstructio

Causes:

- **external hernia**
- **postoperative adhesions**.
- strictures,
- tumor, foreign bodies



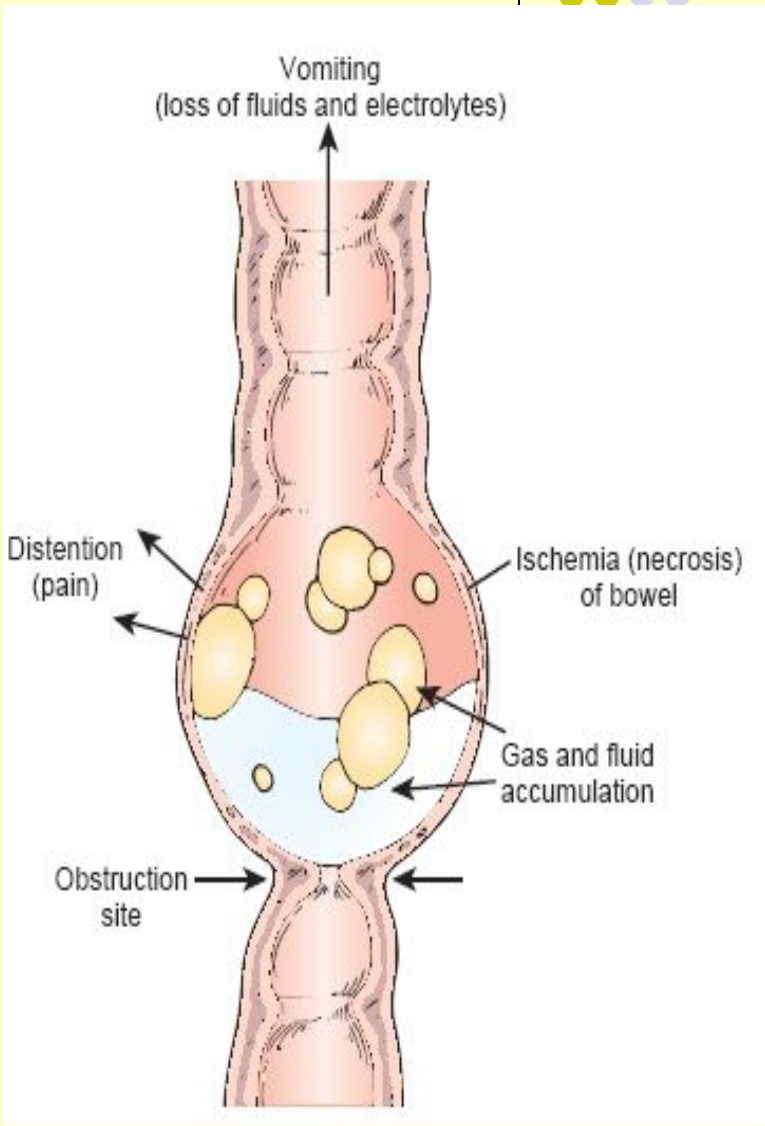
Intestinal obstruction



Paralytic, or adynamic, obstruction

- after abdominal surgery
- inflammatory conditions of the abdomen,
- pelvic and back injuries.
- chemical irritation (bile, bacterial toxins, electrolyte imbalances).

Intestinal obstruction pathogenesis



Intestinal autointoxication

poisoning of the organism by toxic substances from the bowels.

The causes and mechanisms:

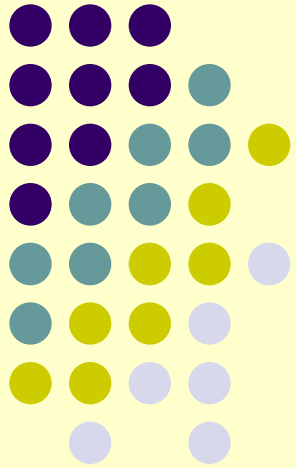
- **formation of the toxic substances** - skatole, cresol, indole, phenol.
- **permeability of the intestinal wall** - inflammation and distension of bowels.
- **Hepatic failure** due to the decrease of the liver detoxication activity.

Intestinal autointoxication

General symptoms

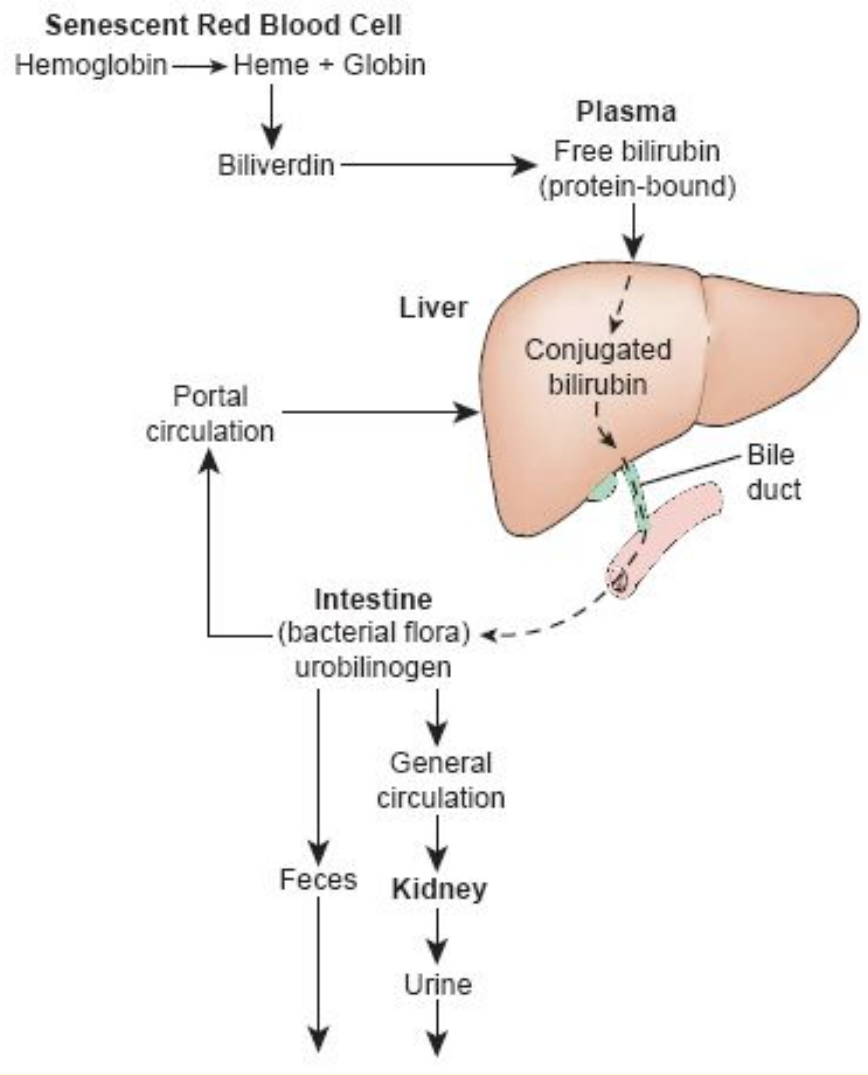
- □ ABP and pain sensitivity,
- □ glycogen amount in the liver, hyperglycaemia,
- myocardial dystrophy
- respiratory depression,
- headaches, brain activity inhibition up to coma
- □ appetite, violation of digestion, anemia.

Liver pathology

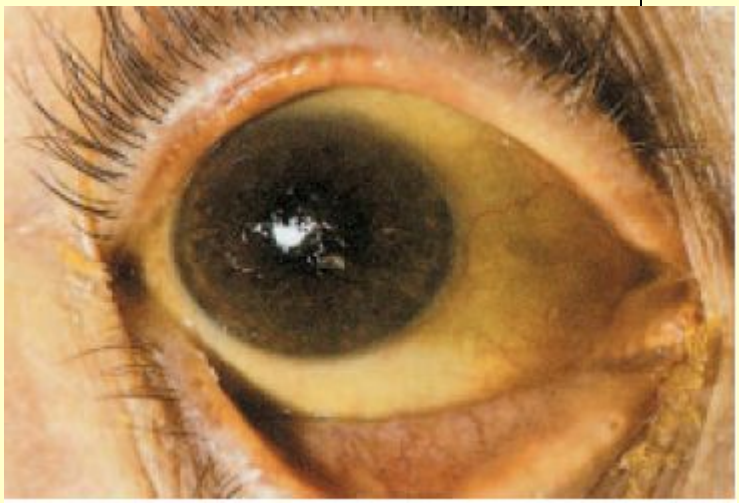


Normal bilirubin metabolism

Unconjugated (free) bilirubin	Conjugated bilirubin
Undirect bilirubin	Direct bilirubin
Lipid-soluble	Water-soluble
Normally in plasma	Normally in bile
Not filtered by glomureli	Small percent filtered by kidney



Jaundice



- Yellowish discoloration

of the skin, mucosal surfaces and deep tissues

Reasons:

- □ destruction of RBC
- impaired uptake of bilirubin by liver cells
- □ conjugation
- □ bilirubin secretion

Prehepatic jaundice

- Reason - □ hemolysis of red blood cells:
  - Hemolytic blood transfusion reaction
  - Hereditary and acquired hemolytic anemias
  - Neonatal jaundice (physiologic jaundice)
- Blood - unconjugated bilirubin □
- Urine – urobiline normal or □
- Faeces – stercobiline □

Hepatic jaundice

- Synonym – intrahepatic or hepatocellular jaundice
- Hepatitis, cirrhosis, cancer of the liver.
  - □ bilirubin uptake, conjugation, excretion
- Blood - unconjugated bilirubin □, conjugated bilirubin □
- Urine – urobilin normal or □, bilirubin □
- Faeces – stercobiline normal or □

Hepatic jaundice

Hereditary disorders:

- □ bilirubin uptake (Gilbert's syndrome);
- □ of enzymes supporting conjugation (Crigler-Najjar syndrome);
- □ bilirubin excretion (Dubin-Johnson syndrome).

Posthepatic jaundice

- Synonym – mechanical, obstructive, cholestatic jaundice
- Reasons – obstruction of bile flow between the liver and the intestine
  - Structural disorders of the bile duct
  - Cholelithiasis
  - Tumors in the bile duct
- Blood - conjugated bilirubin □ , bile salts, cholesterol
- Urine – urobilin absent, bilirubin □
- Faeces – stercobiline absent

Cholemia - bile in blood

 levels of cholesterol, bile acids and bilirubin

Clinical signs of cholemia:

- Urine dark color.
- Xanthomas formation (due to excess of cholesterol)
- Skin itching (pruritis)
- Arterial hypotension
- Bradycardia
- irritability and excitability of the patient
- Depression, insomnia, increased fatigueability
- Multiply subcutaneous hemorrhages

Acholia

 or absence of bile secretion into the intestines

Clinical signs of acholia:

- steatorrhea - fat, clay colored stools
- intestinal autointoxication and disbacteriosis development
- deficiency of fat soluble vitamins (A,D,E,K)

Hepatic failure

severe impairment of the liver functions

- Acute failure (fulminant hepatitis)
- Chronic failure (alcoholic liver cirrhosis)

Clinical signs

Fetor hepaticus - musty, sweetish odor of the breath in the patient with liver failure.

Hepatic failure

Hematologic Disorders.

- anemia due to
  - blood loss,
  - excessive destruction or impaired formation of RBC,
  - folic acid deficiency
- leukopenia, thrombocytopenia due to excessive destruction as the result of splenomegaly,
- coagulation defects due to protein synthesis by the liver, vitamin K deficiency

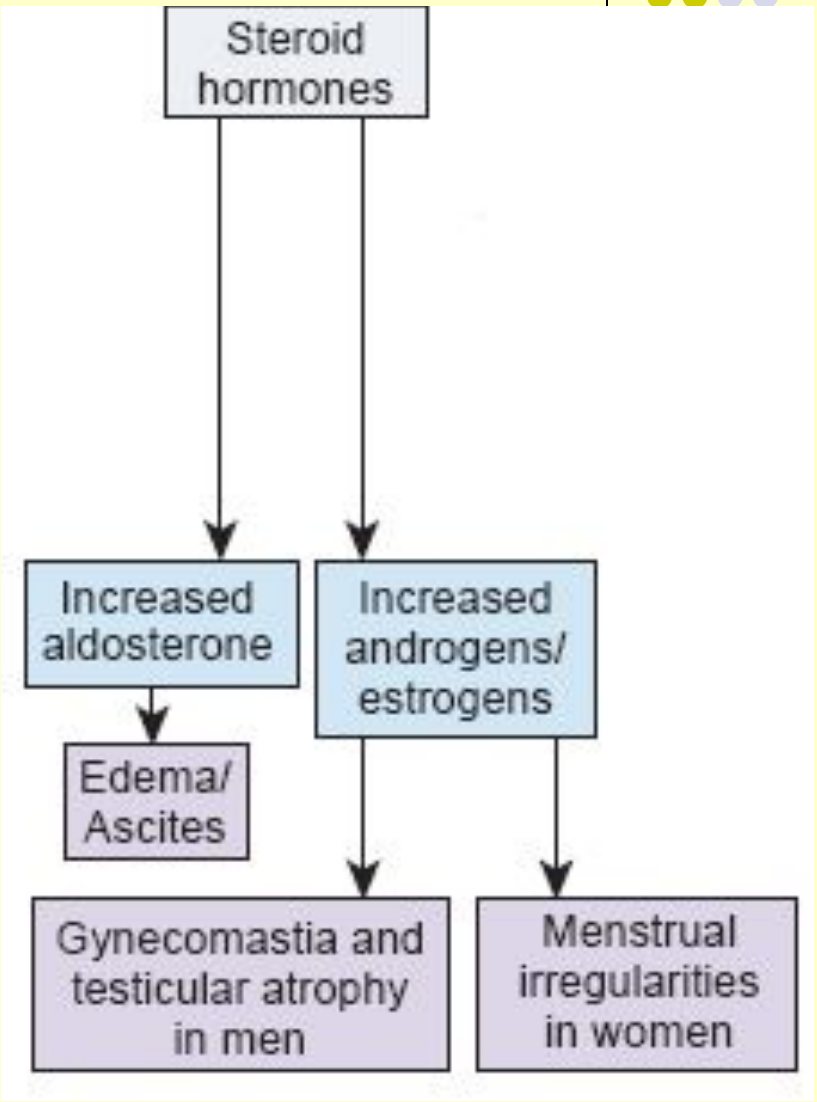
Hepatic failure

Endocrine Disorders

–impaired steroid hormones metabolism

Skin Disorders.

- telangiectases
- palmar erythema
- clubbing of the fingers
- jaundice



Hepatic failure

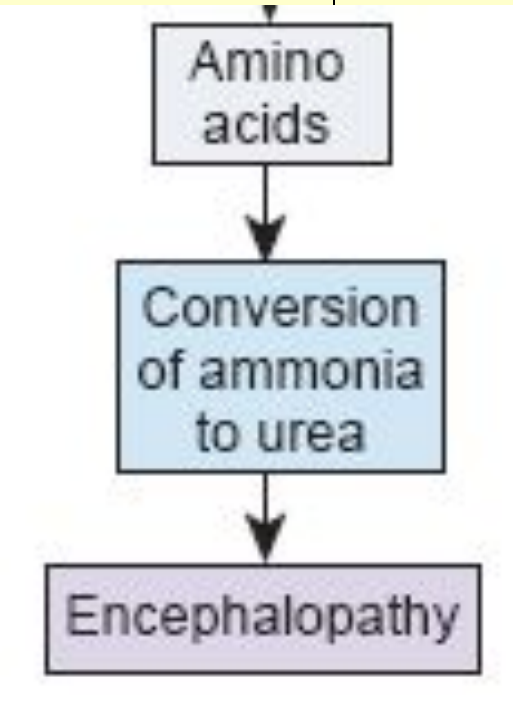
Hepatic Encephalopathy

Stages **I - IV** (from irritability to coma)

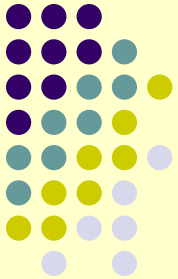
- flapping tremor - asterixis;
- memory loss;
- personality changes;
- impaired speech and movements.

Pathogenesis - accumulation of neurotoxins.

- Ammonia enters general and cerebral circulation.
- Worsening after protein meals



Hepatic failure



Hepatorenal Syndrome

- Acute liver failure kidneys hypoperfusion reduction in glomerular filtration rate kidney failure

Clinical signs:

- urine output (oliguria)
- blood urea, nitrogen and creatinine levels.
- renin secretion ABP

Portal hypertension

- □ resistance to flow in the portal venous system and □ portal vein pressure

Prehepatic portal hypertension:

- portal vein thrombosis
- external compression due to cancer or enlarged lymph nodes.

Portal hypertension

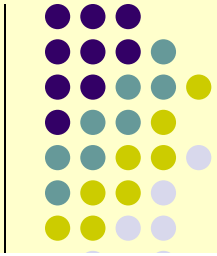
Intrahepatic portal hypertension:

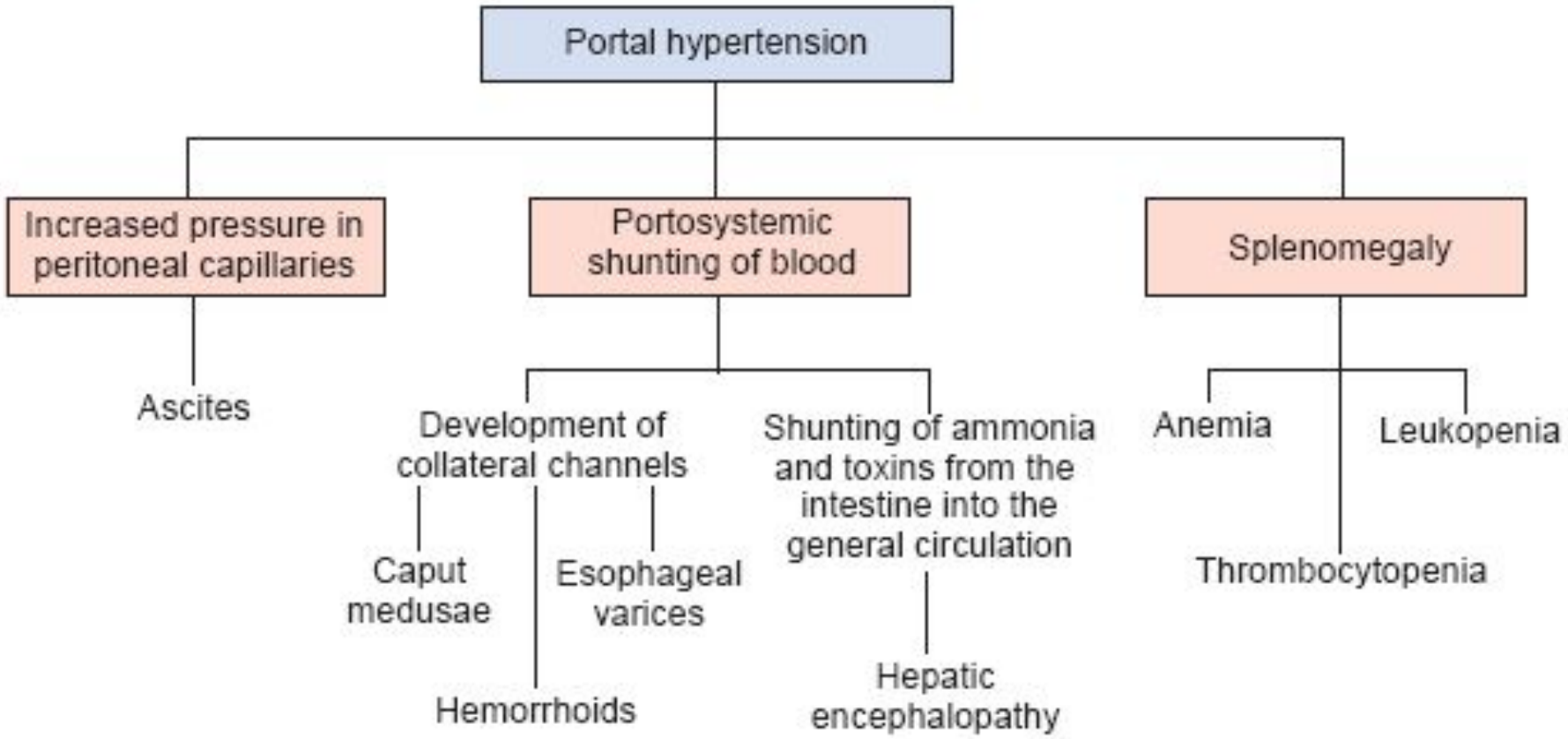
- liver cirrhosis.
- infestation of the liver with schistosomes
- polycystic liver
- hepatic tumors.

Post hepatic portal hypertension:

- thrombosis of the hepatic veins,
- severe right-sided heart failure
- Budd-Chiari syndrome
  - congestive disease of the liver caused by occlusion of the portal veins and their tributaries.

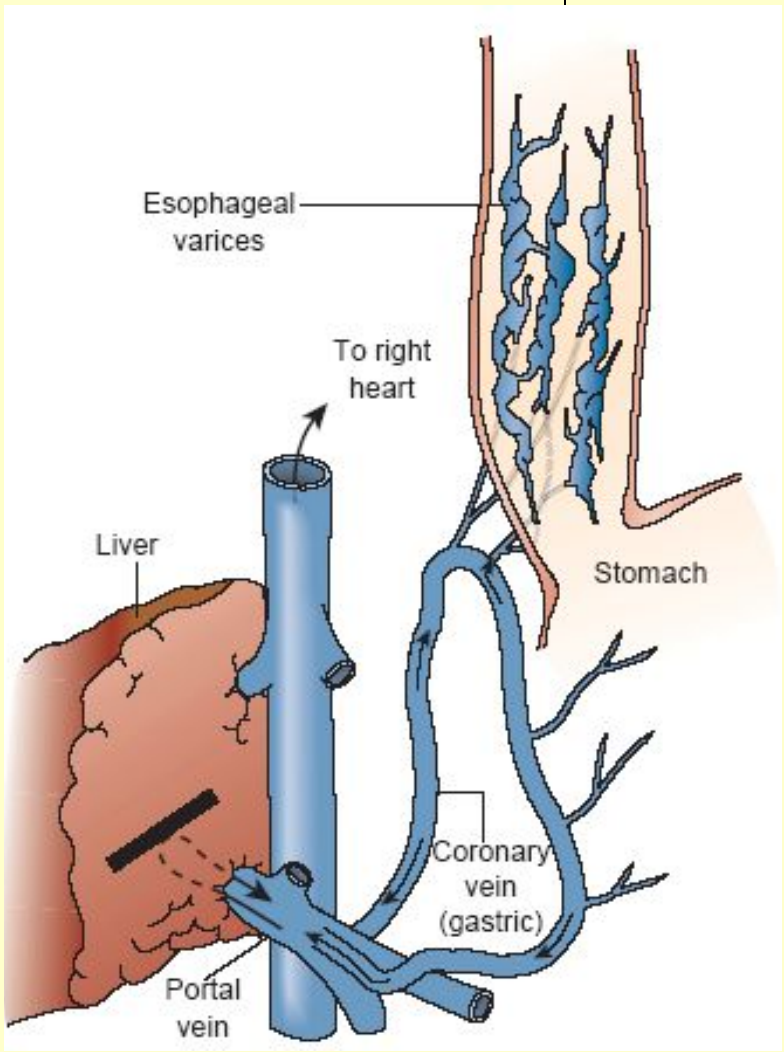
Complications of portal hypertension





Complications of portal hypertension

- **Portosystemic Shunts.**
- **caput medusae** - dilated veins around the umbilicus
- portopulmonary shunts – results in cyanosis.
- *esophageal varices* - are subject to rupture, producing massive and sometimes fatal hemorrhage.



Hepatolienal syndrome

Enlargement of liver is usually combined with the enlargement of spleen due to:

- common vein system
- common innnervation
- common lymphatic