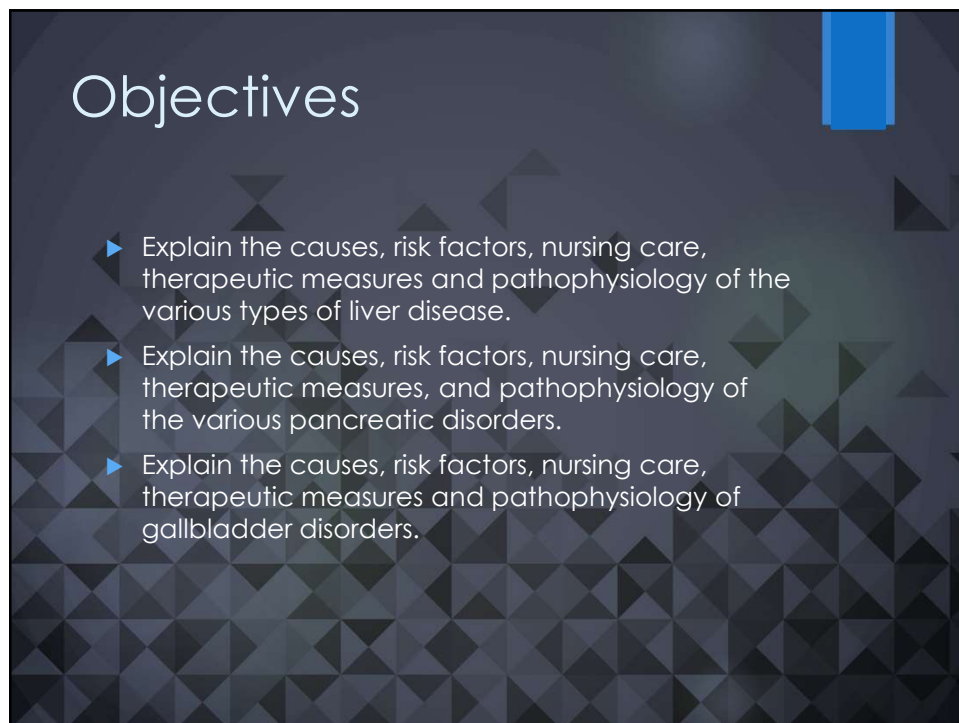


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3

Hepatitis

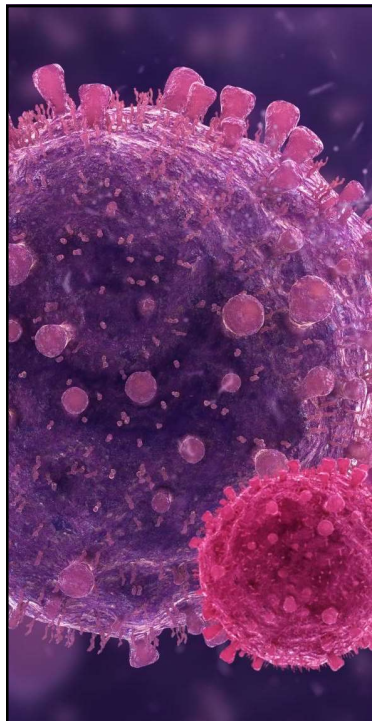
Inflammation of the cells of the liver

Causes

- Bacterial infection
- Medications, alcohol, chemicals toxic to the liver
- Metabolic or vascular disorders

Often caused by a virus

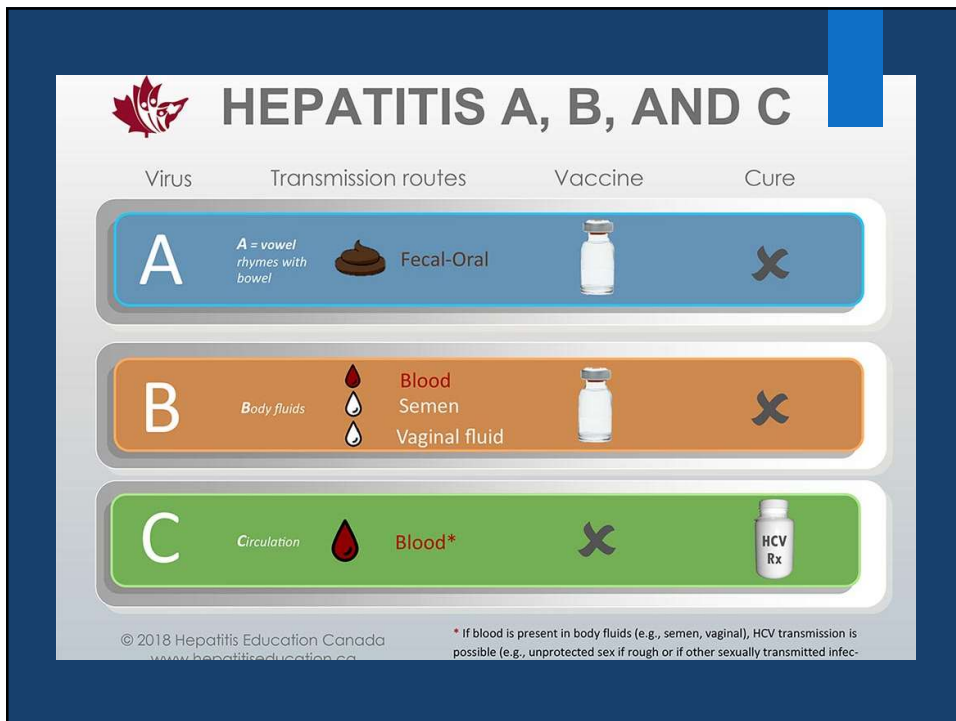
4














Hepatitis-Types

- ▶ Types of viral hepatitis
 - ▶ Hepatitis A virus (HAV)
 - ▶ Hepatitis B virus (HBV)
 - ▶ Hepatitis C virus (HCV)
 - ▶ Hepatitis D virus (HDV)
 - ▶ Hepatitis E virus (HEV)
 - ▶ HAV, HCV, and HBV most common in the United States

5



Virus	Transmission routes	Vaccine	Cure
A <i>A = vowel rhymes with bowel</i>	 Fecal-Oral		
B <i>Body fluids</i>	 Blood  Semen  Vaginal fluid		
C <i>Circulation</i>	 Blood*		

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* If blood is present in body fluids (e.g., semen, vaginal), HCV transmission is possible (e.g., unprotected sex if rough or if other sexually transmitted infection is present).

6



Hepatitis-Prevention

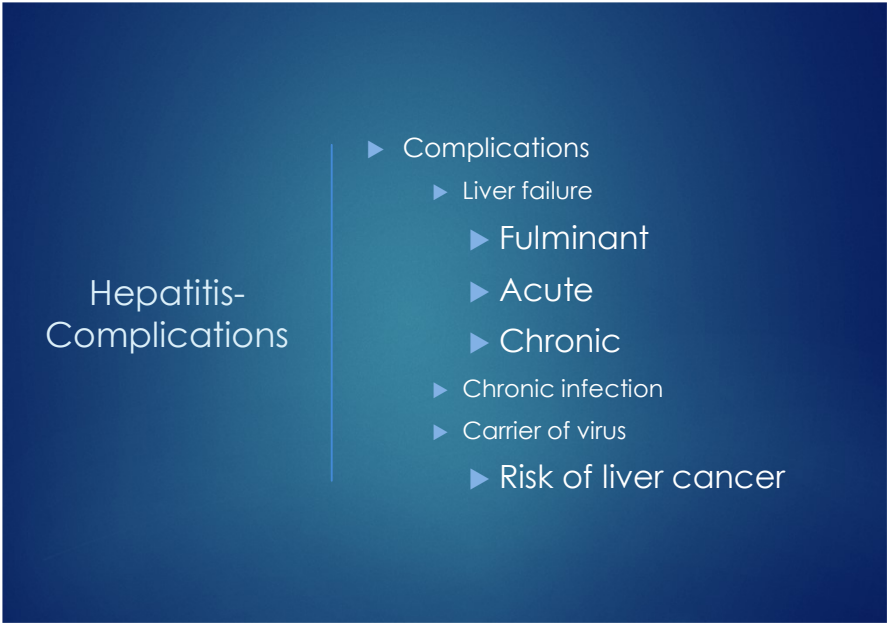
- ▶ Prevention
 - ▶ Transmission precautions
 - ▶ Standard precautions
 - ▶ Hand hygiene
 - ▶ Vaccines
 - ▶ HAV
 - ▶ HBV
 - ▶ Immunoglobulin (IG)
 - ▶ Public health measures

7

Hepatitis-Signs/Symptoms

- ▶ Signs and symptoms
 - ▶ Can be asymptomatic
 - ▶ Prodromal stage
 - ▶ Flu-like symptoms, right upper quadrant (RUQ) pain
 - ▶ Icteric stage
 - ▶ Jaundice, worsening symptoms
 - ▶ Convalescent
 - ▶ Return to normal liver function


8



Hepatitis-Complications

- ▶ Complications
 - ▶ Liver failure
 - ▶ Fulminant
 - ▶ Acute
 - ▶ Chronic
 - ▶ Chronic infection
 - ▶ Carrier of virus
 - ▶ Risk of liver cancer


9



Hepatitis-Testing

- ▶ Diagnostic tests
 - ▶ Serum tests
 - ▶ Liver enzymes
 - ▶ Serum bilirubin
 - ▶ Prothrombin
 - ▶ Serological tests
 - ▶ Liver biopsy

10




Hepatitis- Therapeutics

- ▶ Therapeutic interventions
 - ▶ Identify cause.
 - ▶ Monitor liver function.
 - ▶ Relieve symptoms.
 - ▶ Prevent cirrhosis.
 - ▶ Educate on hydration and nutrition.
 - ▶ Rest.
 - ▶ Avoid alcohol and liver-toxic drugs.

11

Hepatitis- Therapeutics

- ▶ Therapeutic interventions (continued)
 - ▶ HAV or HEV
 - ▶ Supportive care
 - ▶ HBV/HDV
 - ▶ Pegylated interferon therapy
 - ▶ HBV
 - ▶ Antivirals
 - ▶ Pegylated interferon therapy
 - ▶ Liver transplant



12

Hepatitis-Therapeutics

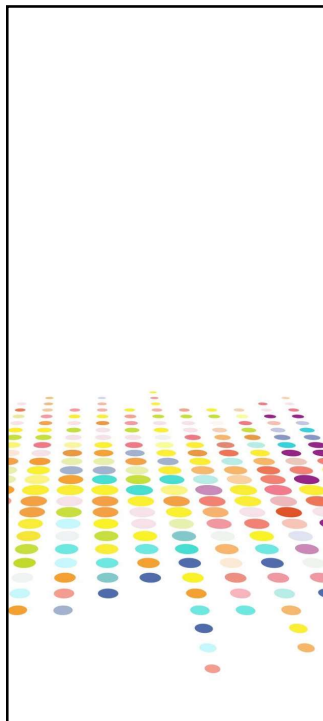
- ▶ Therapeutic interventions (continued)
 - ▶ HCV
 - ▶ Direct-acting antiviral medications
 - ▶ Elbasvir/grazoprevir (Zepatier)
 - ▶ Sofosbuvir/ledipasvir (Harvoni)
 - ▶ Certain genotypes
 - ▶ Interferon therapy



13

Question

- ▶ You are caring for a patient with HBV. When you are discussing the prevention of transmission of hepatitis with sexual activity, she tells you that she uses birth control pills.
- ▶ What do you do?



14

Acute Liver Failure

- ▶ Pathophysiology
 - ▶ Sudden massive loss of liver tissue
- ▶ Etiology
 - ▶ Drug toxicity
 - ▶ Acetaminophen (Tylenol)
 - ▶ Hepatitis

15

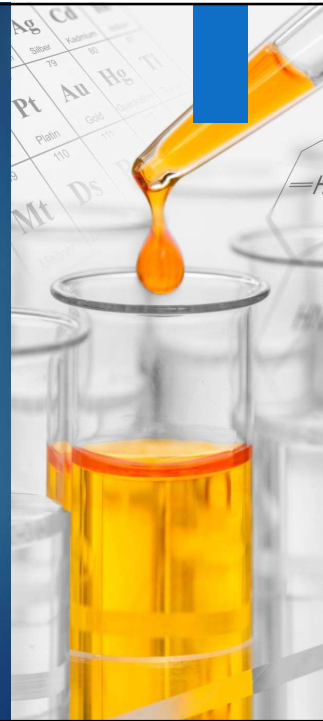
Acute Liver Failure

- ▶ Signs and symptoms
 - ▶ Early: Vague
 - ▶ Jaundice
 - ▶ High Blood levels of bilirubin
 - ▶ Hepatic encephalopathy
 - ▶ Confusion
 - ▶ Coma
 - ▶ Bleeding

16

Acute Liver Failure

- ▶ Diagnostic serum tests
 - ▶ Alanine aminotransferase
 - ▶ Aspartate aminotransferase
 - ▶ Bilirubin
 - ▶ Prothrombin time (PT)
 - ▶ Potassium
 - ▶ Blood glucose



17

Acute Liver Failure

- ▶ Therapeutic interventions
 - ▶ Possible dialysis for overdose
 - ▶ Supportive care
 - ▶ Decrease stimulation and provide rest.
 - ▶ Eliminate all drugs.
 - ▶ High-calorie, low-sodium, and protein diet
 - ▶ Decrease ammonia level: Lactulose
 - ▶ Liver transplant

18

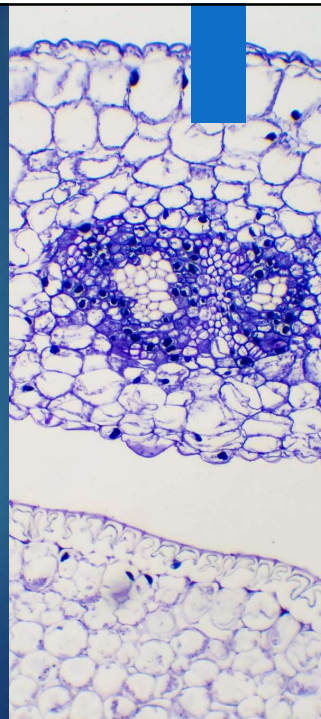
Cirrhosis/Chronic Liver Disease

- ▶ 4.5 million had chronic liver disease and cirrhosis in 2018
- ▶ Progressive, irreversible replacement of healthy liver tissue with scar tissue
- ▶ Often irreversible unless early treatment
- ▶ Etiology
 - ▶ Chronic alcohol use: Most common
 - ▶ Chronic HBV or HCV
 - ▶ Nonalcoholic steatohepatitis or fatty liver disease

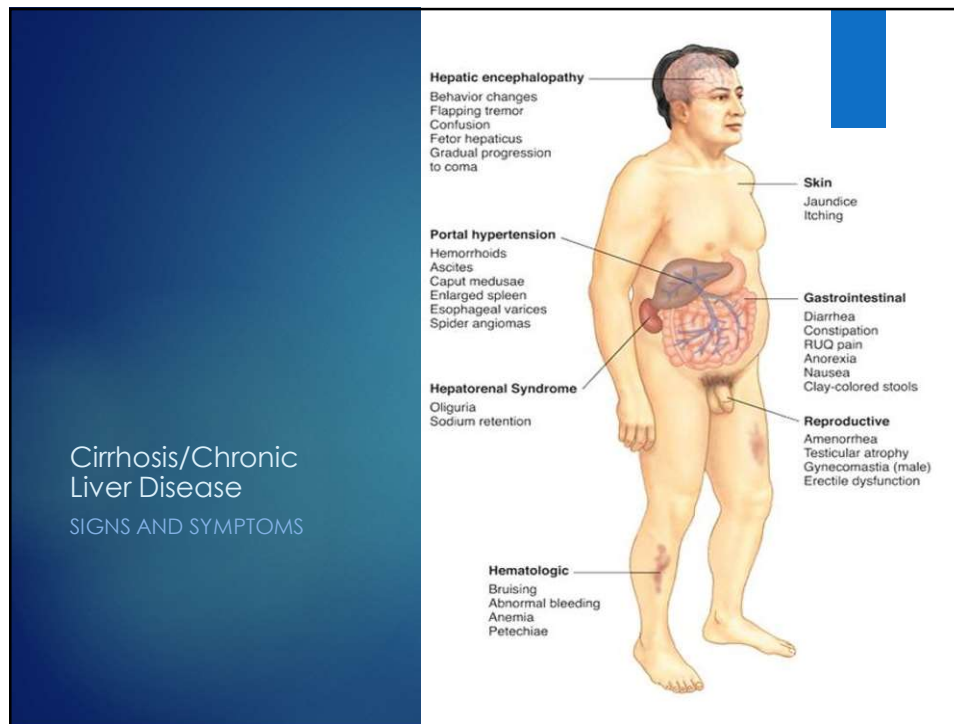
19

Cirrhosis/Chronic Liver Disease

- ▶ Pathophysiology
 - ▶ Inflammation of liver cells
 - ▶ Infiltration with fat and white blood cells (WBCs)
 - ▶ Fibrotic scar tissue replaces liver tissue
 - ▶ Abnormal regeneration
 - ▶ Impaired liver blood flow
 - ▶ Impaired liver function



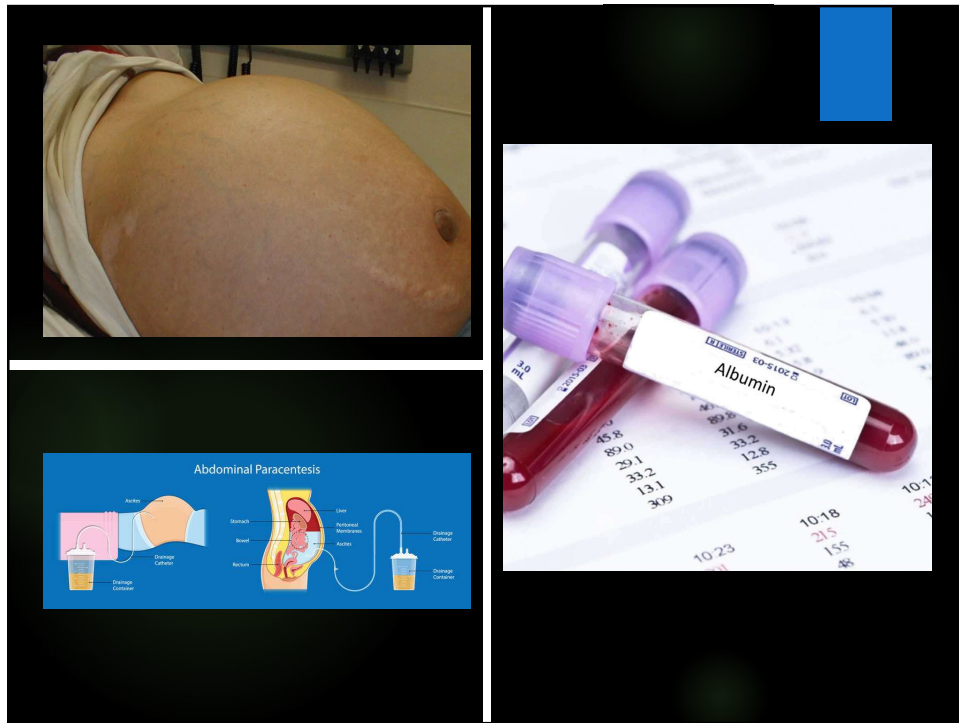
20



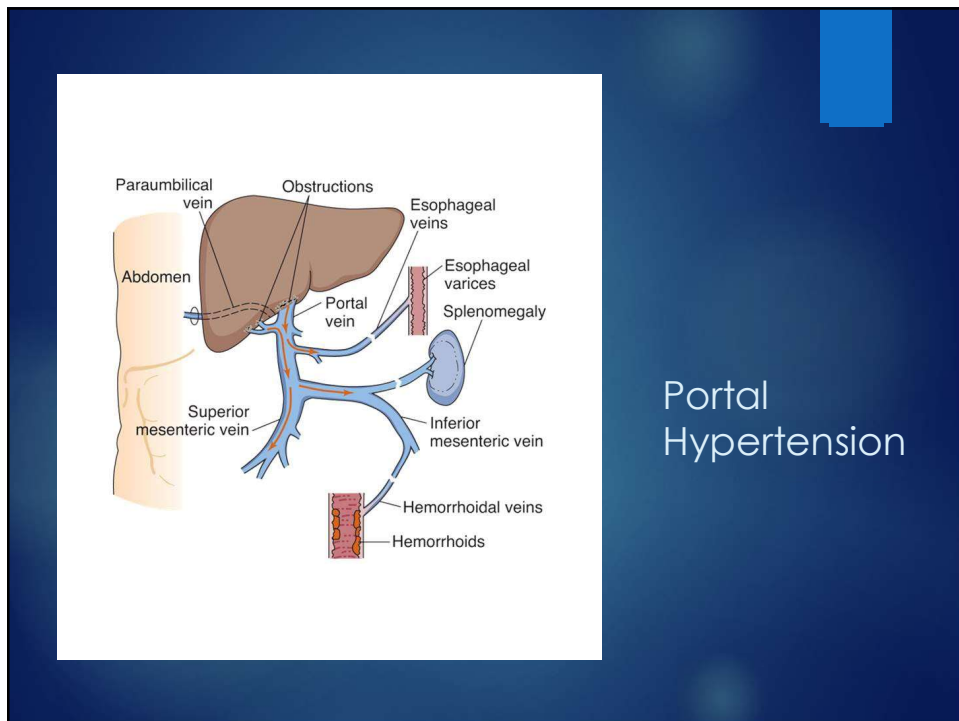
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24



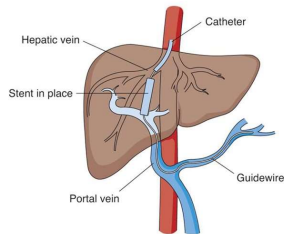
Cirrhosis/Chronic Liver Disease

- ▶ Diagnostic tests
 - ▶ Liver enzymes
 - ▶ Bilirubin
 - ▶ Ammonia
 - ▶ PT
 - ▶ Computed tomography (CT) scan
 - ▶ Magnetic resonance imaging (MRI)
 - ▶ Liver biopsy

25

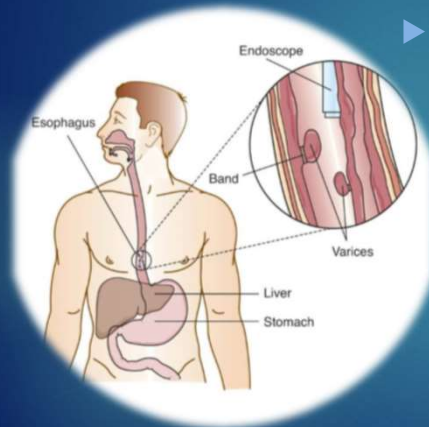
Cirrhosis/Chronic Liver Disease

- ▶ Therapeutic interventions
 - ▶ Ascites
 - ▶ Diuretics
 - ▶ Sodium restriction
 - ▶ Fluid restriction
 - ▶ Albumin infusion
 - ▶ Paracentesis
 - ▶ Transjugular intrahepatic portosystemic shunt (TIPS) (shown in illustration)



26

Cirrhosis/Chronic Liver Disease



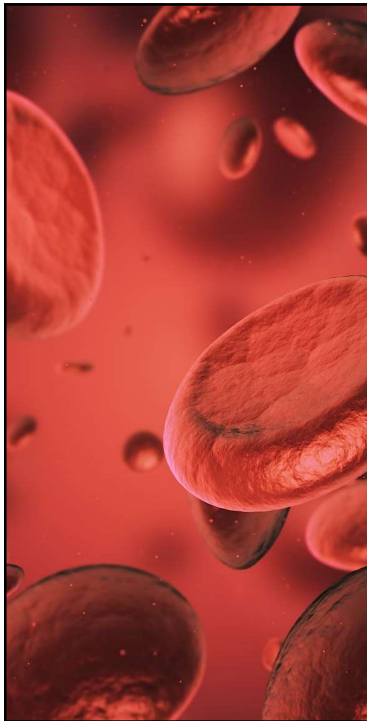
▶ Therapeutic interventions

▶ Esophageal varices

- ▶ Beta blockers
- ▶ Vasoconstrictor
- ▶ Variceal banding (shown in illustration)
- ▶ Transfusion
- ▶ Antibiotic prophylaxis

27

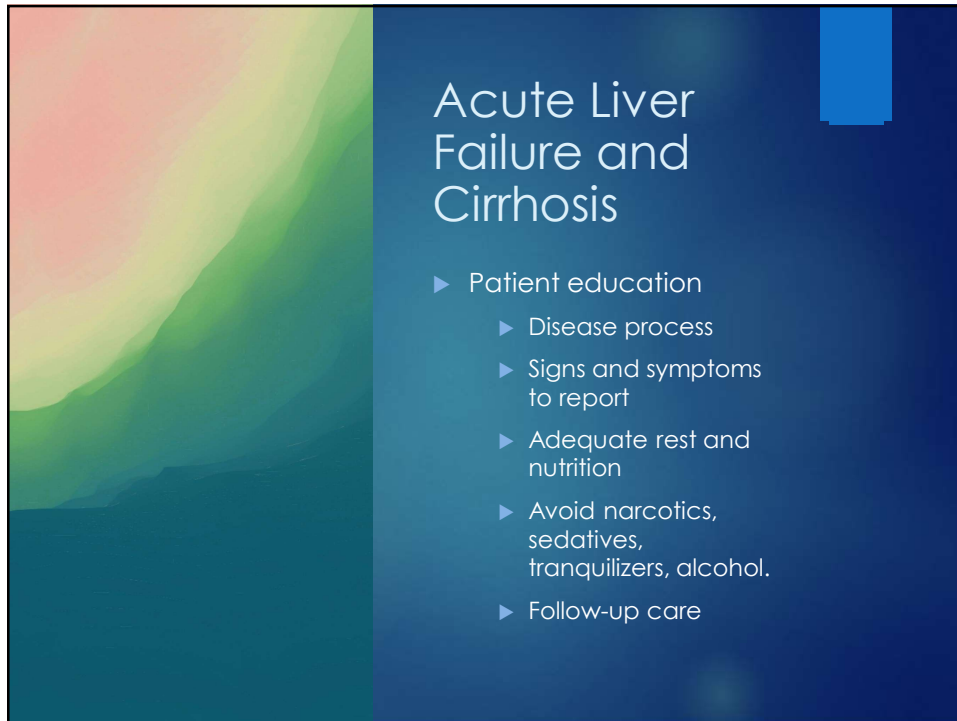
Cirrhosis/Chronic Liver Disease



▶ Therapeutic interventions

- ▶ Hepatic encephalopathy
 - ▶ Lactulose
 - ▶ Rifaximin (Xifaxan)
 - ▶ Vitamins
 - ▶ Albumin

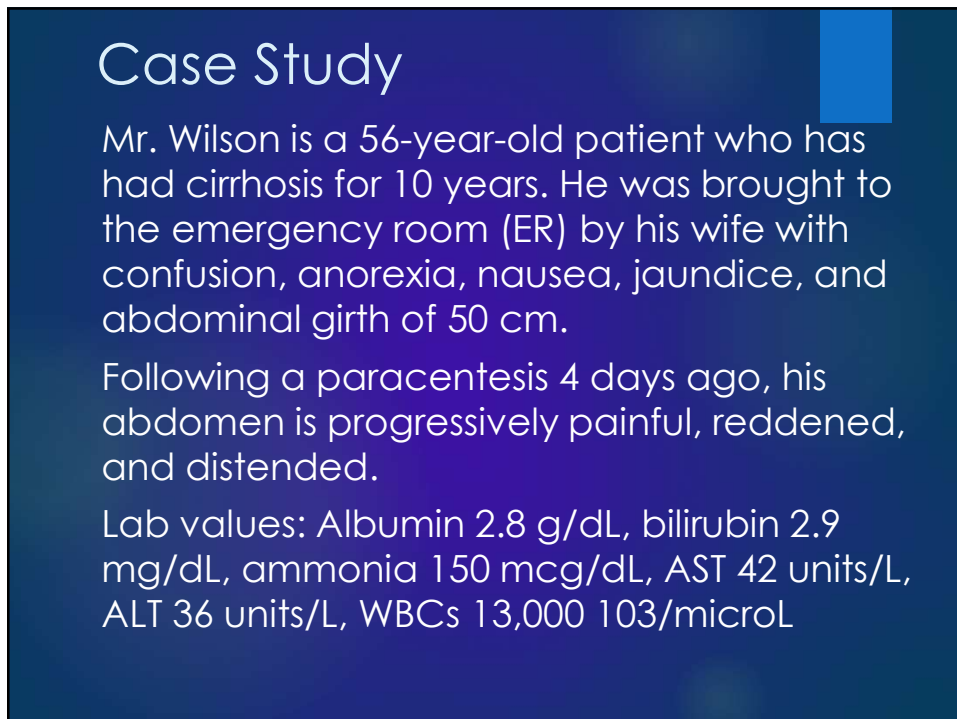
28



Acute Liver Failure and Cirrhosis

- ▶ Patient education
 - ▶ Disease process
 - ▶ Signs and symptoms to report
 - ▶ Adequate rest and nutrition
 - ▶ Avoid narcotics, sedatives, tranquilizers, alcohol.
 - ▶ Follow-up care

29



Case Study

Mr. Wilson is a 56-year-old patient who has had cirrhosis for 10 years. He was brought to the emergency room (ER) by his wife with confusion, anorexia, nausea, jaundice, and abdominal girth of 50 cm.

Following a paracentesis 4 days ago, his abdomen is progressively painful, reddened, and distended.

Lab values: Albumin 2.8 g/dL, bilirubin 2.9 mg/dL, ammonia 150 mcg/dL, AST 42 units/L, ALT 36 units/L, WBCs 13,000 103/microL

30

Mr. Wilson: Suggested Relationships



31

Liver Transplant

- ▶ Candidates
 - ▶ Liver failure
 - ▶ No cancer
 - ▶ No complications
 - ▶ Otherwise stable
- ▶ Anti-rejection medications
- ▶ Signs of rejection
 - ▶ Pulse >100 beats per minute
 - ▶ Temperature >101°F (38°C)
 - ▶ RUQ pain
 - ▶ Increased jaundice

32

Cancer of the Liver

Usually metastasized from another site

Risk factors

- Chronic HBV or HCV
- Nutritional deficiencies
- Exposure to hepatotoxins

▶ Signs and symptoms

- ▶ Encephalopathy
- ▶ Bleeding
- ▶ Jaundice
- ▶ Ascites

33

Cancer of the Liver

▶ Diagnostic tests

- ▶ Elevated alkaline phosphatase (ALP) ← Liver enzyme test
- ▶ MRI
- ▶ CT
- ▶ Biopsy

▶ Therapeutic interventions

- ▶ Surgery
- ▶ Chemotherapy
 - ▶ Sorafenib (Nexavar)
- ▶ Radiation

34

Question

You are monitoring your patient with suspected liver cancer who had a liver biopsy 20 minutes ago. You gather data and notice that the dressing over the site is saturated with bright red drainage.

What do you do?

- ▶ Apply pressure to the site (gloved hands).
- ▶ Obtain a set of vital signs.
- ▶ Notify the registered nurse (RN) and/or HCP.
- ▶ Keep the patient in bed.

35

Pancreatic Disease

36

Acute Pancreatitis

- ▶ Pathophysiology
 - ▶ Inflammation
 - ▶ Autodigestion
 - ▶ Elevated enzymes
 - ▶ Fluid loss

37

Acute Pancreatitis

- ▶ Etiology
 - ▶ Alcohol
 - ▶ Gallstones
 - ▶ Elevated triglycerides
 - ▶ Endoscopic retrograde cholangiopancreatography (ERCP)-induced pancreatitis
 - ▶ Tumors
 - ▶ Idiopathic

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Acute Pancreatitis

► Signs and symptoms

- Abdominal pain
 - Severe, radiates
 - Chest, back, flank
- Guarding
- Rigid abdomen
- Hypotension or shock
- Shallow respirations
- Low-grade fever
- Tachycardia
- Nausea and vomiting
- Jaundice

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Acute Pancreatitis

► Complications

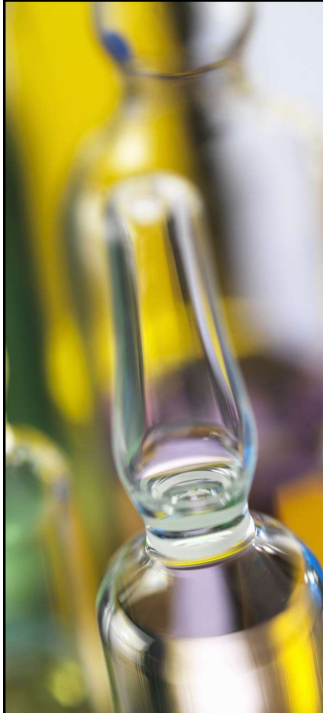
- Systemic inflammatory response syndrome (SIRS)
- Cardiovascular failure
- Acute respiratory distress syndrome
- Acute kidney injury
- Hemorrhage
 - Turner sign
 - Cullen sign-superficial edema and bruising in the subcutaneous fatty tissue around the umbilicus
- Infection

40

Acute Pancreatitis

- ▶ Diagnostic tests
 - ▶ Presence of two items
 - ▶ Abdominal pain
 - ▶ Serum amylase Increased > 3 times normal
 - ▶ Serum lipase increased >3 times normal
 - ▶ Abdominal imaging positive
 - ▶ Ultrasound
 - ▶ CT scan
 - ▶ MRI

41

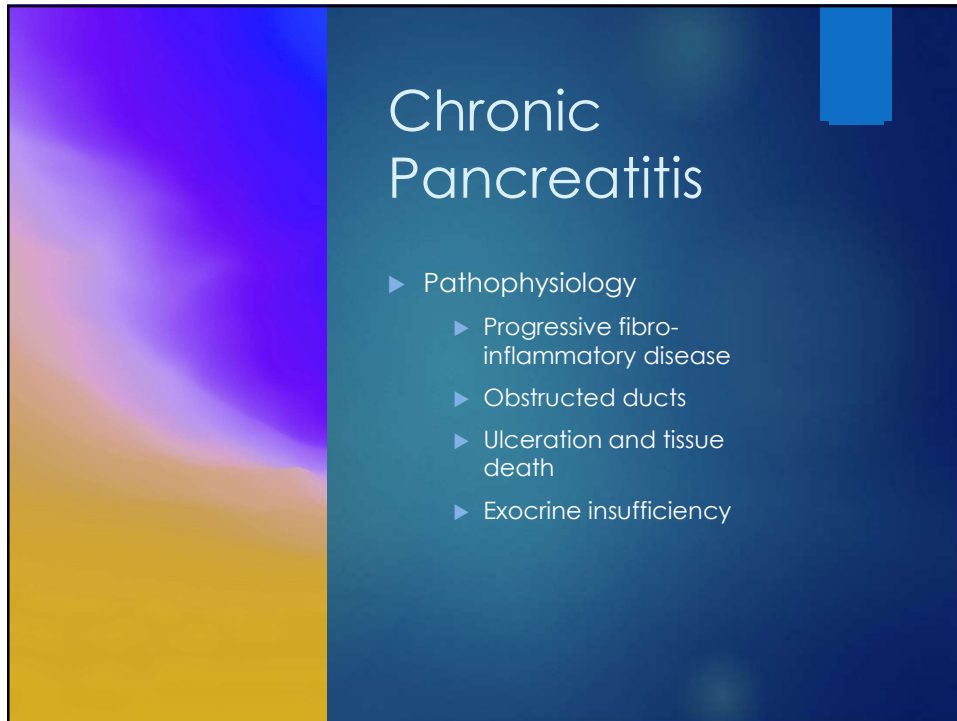


Acute Pancreatitis

- ▶ Therapeutic interventions
 - ▶ Treat PAIN!
 - ▶ Aggressive IV fluids
 - ▶ Nutrition
 - ▶ Mild: Oral
 - ▶ Severe: Enteral
 - ▶ Analgesics
 - ▶ Antibiotics for sepsis

Serum amylase and/or lipast > 3x's higher


42

A presentation slide titled "Chronic Pancreatitis". The left side features a vertical gradient bar transitioning from purple at the top to yellow at the bottom. The right side has a dark blue background with a small blue square in the top right corner. The title is in large white font. Below it, a bulleted list describes the pathophysiology of the condition.

Chronic Pancreatitis

- ▶ Pathophysiology
 - ▶ Progressive fibro-inflammatory disease
 - ▶ Obstructed ducts
 - ▶ Ulceration and tissue death
 - ▶ Exocrine insufficiency

43

A presentation slide titled "Chronic Pancreatitis". The left side features a vertical gradient bar transitioning from dark teal at the top to light green at the bottom, with a geometric pattern of overlapping squares. The right side has a dark blue background with a small blue square in the top right corner. The title is in large white font. Below it, a bulleted list describes the etiology and risk factors of the condition.

Chronic Pancreatitis

- ▶ Etiology
 - ▶ Alcohol abuse
 - ▶ Obstructive biliary disease
 - ▶ Idiopathic
 - ▶ Genetic
 - ▶ Autoimmune
 - ▶ Hyperlipidemia
- ▶ Risk factors
 - ▶ Smoking and acute pancreatitis

44

Chronic Pancreatitis

- ▶ Prevention
 - ▶ Alcohol abstinence
 - ▶ Avoid smoking.
 - ▶ Biliary disease treatment

45

Chronic Pancreatitis

- ▶ Signs and symptoms
 - ▶ Asymptomatic
 - ▶ Epigastric or left upper quadrant pain worsens after eating
 - ▶ Nausea and vomiting
 - ▶ Weight loss
 - ▶ Steatorrhea
 - ▶ Fatty food intolerance
 - ▶ Remissions and exacerbations

46

Chronic Pancreatitis

- ▶ Complications
 - ▶ Abscesses
 - ▶ Fistulas
 - ▶ Pleural effusion
 - ▶ Malabsorption
 - ▶ Diabetes
 - ▶ Cancer
- ▶ Diagnostic tests
 - ▶ CT scan
 - ▶ MRI
 - ▶ Endoscopic ultrasound
 - ▶ Pancreatic enzymes normal or low
 - ▶ High fecal fat level

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Chronic Pancreatitis

- ▶ Therapeutic interventions
 - ▶ Stop alcohol use.
 - ▶ NSAIDs, analgesics, and proton pump inhibitors (PPIs)
 - ▶ Small low-fat meals
 - ▶ Pancreatic enzyme replacement
 - ▶ Stents
 - ▶ Surgery

48

Cancer of the Pancreas

- ▶ Ductal adenocarcinoma of exocrine pancreas
- ▶ Risk factors
 - ▶ Smoking
 - ▶ Obesity
 - ▶ Work exposure to chemicals
 - ▶ Diabetes mellitus
 - ▶ Chronic pancreatitis

49

Cancer of the Pancreas

- ▶ Signs and symptoms
 - ▶ None early typically
 - ▶ Usually has metastasized
 - ▶ Weight loss
 - ▶ Abdominal pain radiates to back
 - ▶ Worsens at night, gnawing
 - ▶ Anorexia, nausea and vomiting, fullness

50

Cancer of the Pancreas


- ▶ Signs and symptoms (continued)
 - ▶ Pruritus **Itching**
 - ▶ Depression
 - ▶ Fatigue
 - ▶ Jaundice
 - ▶ Recent diagnosis of diabetes mellitus

51

Cancer of the Pancreas

- ▶ Preoperative complications
 - ▶ Malnutrition
 - ▶ Spread of cancer
 - ▶ Gastric or duodenal obstruction
- ▶ Postoperative complications
 - ▶ Infection
 - ▶ Fistula formation
 - ▶ Malabsorption syndrome
- ▶ Thrombophlebitis

52



Cancer of the Pancreas

- ▶ Diagnostic tests
 - ▶ Serum amylase/lipase
 - ▶ ALP
 - ▶ Bilirubin
 - ▶ Coagulation studies
 - ▶ Carbohydrate antigen 19-9
 - ▶ CT, MRI, ultrasound, ERCP
 - ▶ Biopsy

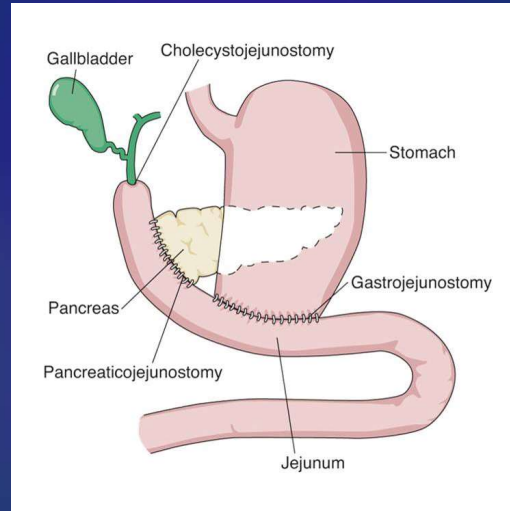
53

Cancer of the Pancreas

- ▶ Therapeutic interventions
 - ▶ Surgery
 - ▶ Whipple procedure (pancreatoduodenectomy)
 - ▶ Distal pancreatectomy
 - ▶ Total pancreatectomy: Rare
 - ▶ Stent or bypass relieves biliary obstruction
 - ▶ Chemotherapy
 - ▶ Radiation

54

Whipple Procedure



55

Cancer of the Pancreas

- ▶ Patient education
 - ▶ Management of hyperglycemia
 - ▶ Pancreatic enzyme replacement
 - ▶ Dressing changes
 - ▶ Complications to report
 - ▶ Hospice referral

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57

A slide titled "Gallbladder Disorders" with a dark blue background. The title is on the left, and a bulleted list of disorders is on the right, separated by a vertical line. The list includes Cholecystitis (Inflammation), Cholelithiasis (cholecystolithiasis) (Stones), and Choledocholithiasis (Stones in common bile duct).

Gallbladder Disorders

- ▶ Cholecystitis
 - ▶ Inflammation
- ▶ Cholelithiasis (cholecystolithiasis)
 - ▶ Stones
- ▶ Choledocholithiasis
 - ▶ Stones in common bile duct

58

Gallbladder Disorders

▶ Etiology

- ▶ Risk increases with age
- ▶ Family history
- ▶ Obesity
- ▶ Bile stasis
- ▶ High cholesterol intake
- ▶ Fasting
- ▶ Sedentary lifestyle
- ▶ More often in women

59

Gallbladder Disorders

▶ Signs and symptoms

- ▶ Silent stones
- ▶ White, clay-colored stools
- ▶ Elevated vital signs
- ▶ Vomiting
- ▶ Jaundice
- ▶ Epigastric pain
 - ▶ Biliary Colic
 - Pain radiating to right shoulder or scapula
- ▶ Nausea/vomiting
- ▶ Indigestion
- ▶ RUQ tenderness
- ▶ Positive Murphy sign
- ▶ Biliary colic

60

Gallbladder Disorders

- ▶ Complications
 - ▶ Cholangitis
 - ▶ Necrosis/perforation of gallbladder
 - ▶ Fistulas
 - ▶ Adenocarcinoma of gallbladder
 - ▶ Acute pancreatitis

61

Gallbladder Disorders

- ▶ Diagnostic tests
 - ▶ Ultrasound
 - ▶ Endoscopic
 - ▶ CT scan
 - ▶ Magnetic resonance cholangiopancreatography
 - ▶ ERCP
 - ▶ Cholescintigraphy (Hepatobiliary iminodiacetic acid scan)
 - ▶ Elevated WBC count
 - ▶ Elevated direct bilirubin

62

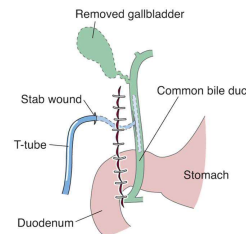
Gallbladder Disorders

- ▶ Therapeutic interventions
 - ▶ Analgesics
 - ▶ Bile acid sequestrants
 - ▶ Antiemetics
 - ▶ NPO, advancing to low-fat diet

63

Cholelithiasis Treatment

- ▶ Cholecystectomy
 - ▶ Laparoscopic surgery
 - ▶ Most common
 - ▶ Traditional surgery (open)
 - ▶ T-tube (shown in illustration)
- ▶ Medication to dissolve stones



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