WEEK 9: Nursing care for with hepatobiliary pancreatic disorders including: Pancreatitis, Cancer of the pancreas, Hepatitis, Liver cirrhosis, Cholelithiasis, & cholecystitis

Acute Pancreatitis

Acute pancreatitis (AP), also referred to as acute pancreatic necrosis, is a sudden inflammation of the pancreas. The primary causes of AP include gallstone obstruction, heavy alcohol use, systemic diseases, trauma, and mumps in children. AP can be a single event, recur, or progress to chronic pancreatitis and pancreatic failure. Treatment varies depending on the severity, ranging from conservative measures to intensive care unit (ICU) admission for severe cases.

Still from 3D medical animation of acute pancreatitis

Signs and Symptoms

Common symptoms of acute pancreatitis include severe epigastric pain that radiates to the back, nausea, vomiting, loss of appetite, fever, chills, hemodynamic instability, tachycardia, respiratory distress, peritonitis, and hiccups. Severe disease may present with uncommon symptoms such as Grey-Turner's sign, Cullen's sign, pleural effusions, Grünwald sign, Körte's sign, Kamenchik's sign, Mayo-Robson's sign, and Mayo-Robson's point.

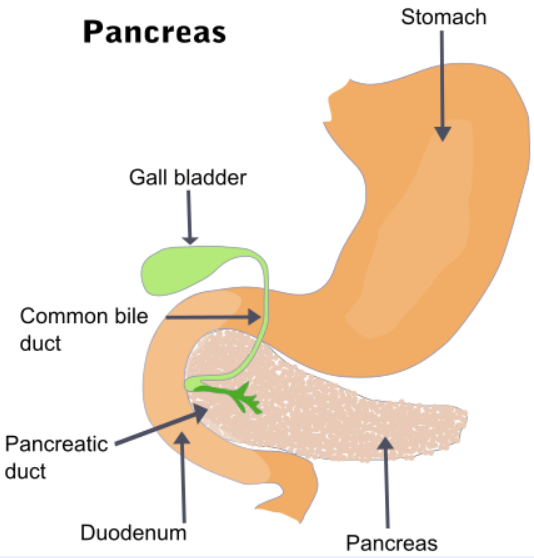
Complications

Complications of acute pancreatitis can be locoregional or systemic. Locoregional complications include pancreatic pseudocyst, phlegmon/abscess formation, splenic artery pseudoaneurysms, haemorrhage, thrombosis, duodenal obstruction, common bile duct obstruction, and pancreatic ascites. Systemic complications include acute respiratory distress syndrome (ARDS), multiple organ dysfunction syndrome, disseminated intravascular coagulation (DIC), hypocalcaemia, hyperglycaemia, insulin-dependent diabetes mellitus, malabsorption, and a variety of metabolic, respiratory, renal, circulatory, gastrointestinal, hepatobiliary, neurologic, hematologic, and dermatologic complications.

Causes

The most common causes of acute pancreatitis are biliary pancreatitis due to gallstones, alcohol, idiopathic origins, metabolic disorders, post-endoscopic retrograde cholangiopancreatography (ERCP), abdominal trauma, penetrating ulcers, pancreatic carcinoma, various drugs, infections, structural abnormalities, radiotherapy, autoimmune pancreatitis, and severe hypertriglyceridaemia. Less common causes include scorpion venom, Chinese liver fluke, ischaemia from surgeries, fat necrosis, pregnancy, infections other than

mumps, hyperparathyroidism, valproic acid, cystic fibrosis, anorexia or bulimia, and codeine phosphate reaction.



Anatomy of the pancreas

Diagnosis

Diagnosis of acute pancreatitis involves clinical history, physical examination, blood investigations, and imaging techniques. The presence of at least two out of three criteria—abdominal pain, elevated serum lipase or amylase, and consistent abdominal imaging findings—confirms the diagnosis.

Differential Diagnosis

Differential diagnoses include perforated peptic ulcer, biliary colic, acute cholecystitis, pneumonia, pleuritic pain, and myocardial infarction.

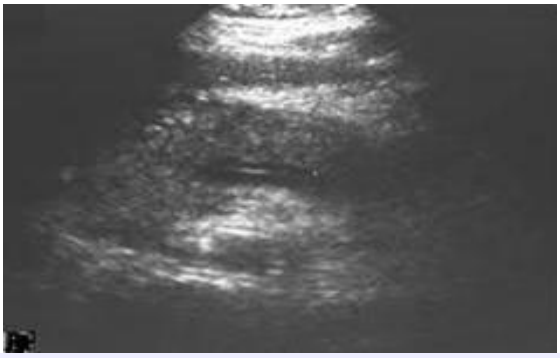
Biochemical

Elevated serum amylase and lipase levels are indicative of acute pancreatitis, but these tests do not assess disease severity. Serum lipase is preferred for diagnosis due to its higher sensitivity and specificity.

Imaging

A combination of triple-phase abdominal CT and abdominal ultrasound is considered the gold standard for evaluating acute pancreatitis. MRI and MRCP can also provide detailed imaging, especially useful for patients allergic to CT contrast materials.

Axial CT in a patient with acute exudative pancreatitis showing extensive fluid collections surrounding the pancreas



Abdominal ultrasonography of acute pancreatitis

Treatment

Initial management includes aggressive fluid resuscitation, pain control, nothing by mouth, and nutritional support.

Fluid Replacement

Aggressive hydration with isotonic crystalloid solutions is very important. Fluid requirements should be reassessed frequently in the first 24 to 48 hours.

Pain Control

Pain is managed with intravenous opioids like hydromorphone or fentanyl. Meperidine is less favoured due to its short half-life and risk of neuromuscular side effects.

Bowel Rest

Patients are kept nil by mouth to allow the pancreas to rest. Post-pyloric enteral feeding is preferred over total parenteral nutrition to reduce the risk of relapse.

Nutritional Support

Early, post-pyloric enteral feeding is now preferred due to its physiological benefits and reduced side effects compared to TPN.

Oxygen and Antibiotics

Oxygen may be provided if Pao2 levels fall below 70mm Hg. Antibiotics are started if an infection is suspected but should be discontinued if cultures are negative.

Endoscopic Retrograde Cholangiopancreatography (ERCP)
ERCP is indicated if a gallstone is detected or if there is clinical deterioration or lack of improvement after 24 hours.

Surgery
Surgery is reserved for infected pancreatic necrosis, diagnostic uncertainty, and complications. Infection is diagnosed by gas bubbles on CT scan or positive bacterial culture from FNA.

Prognostic Scoring Systems
Prognostic scoring systems such as the Ranson Criteria, APACHE II, Balthazar score, Glasgow score, and BISAP score help predict the severity and outcomes of acute pancreatitis. These scores guide the need for intensive care and help predict mortality rates.

Ranson Score
The Ranson score uses criteria at admission and within 48 hours to predict the severity of acute pancreatitis.

APACHE II Score
APACHE II is used to predict mortality and assess severity at admission and during the first few days of hospitalization.

Balthazar Score
The Computed Tomography Severity Index (CTSI) assesses the severity of acute pancreatitis based on CT imaging findings.

Glasgow and BISAP Scores
The Glasgow score is valid for both gallstone and alcohol-induced pancreatitis, while the BISAP score predicts mortality risk using fewer variables.

Epidemiology
In the United States, acute pancreatitis has an annual incidence of 18 cases per 100,000 population, accounting for 220,000 hospitalizations. The incidence has increased over time, but mortality rates have remained stable due to better outcomes. The most common cause in Western countries is alcohol, while in Eastern countries, gallstones are the leading cause.

Self-assessment MCQs (select the best answer)
1. **What is the most common cause of acute pancreatitis in Western countries?**
a. Gallstones
b. Alcohol
c. Hypertriglyceridaemia
d. Idiopathic origins
e. Trauma

2. **Which of the following is NOT a common symptom of acute pancreatitis?**
a. Severe epigastric pain
b. Nausea
c. Loss of appetite
d. Hemodynamic instability

e. Hemoptysis

3. Which imaging modality is considered the gold standard for evaluating acute pancreatitis?
a. Chest X-ray
b. Abdominal ultrasound
c. MRI
d. Triple-phase abdominal CT
e. PET scan

4. Which biochemical marker is preferred for the diagnosis of acute pancreatitis due to its higher sensitivity and specificity?
a. Serum amylase
b. Serum lipase
c. C-reactive protein
d. Serum bilirubin
e. Serum calcium

5. Which prognostic scoring system uses criteria at admission and within 48 hours to predict the severity of acute pancreatitis?
a. APACHE II Score
b. Balthazar Score
c. Glasgow Score
d. BISAP Score
e. Ranson Score

6. Which of the following is a locoregional complication of acute pancreatitis?
a. Acute respiratory distress syndrome (ARDS)
b. Multiple organ dysfunction syndrome
c. Pancreatic pseudocyst
d. Disseminated intravascular coagulation (DIC)
e. Hypocalcaemia

7. What is the first-line management for pain control in acute pancreatitis?
a. Oral NSAIDs
b. Intravenous acetaminophen
c. Intravenous opioids
d. Oral tramadol
e. Intramuscular codeine

8. Which of the following is NOT a cause of acute pancreatitis?
a. Gallstones
b. Alcohol
c. Scorpion venom
d. Hyperthyroidism
e. Post-ERCP

9. In the treatment of acute pancreatitis, why is post-pyloric enteral feeding preferred over total parenteral nutrition?
a. It is more cost-effective

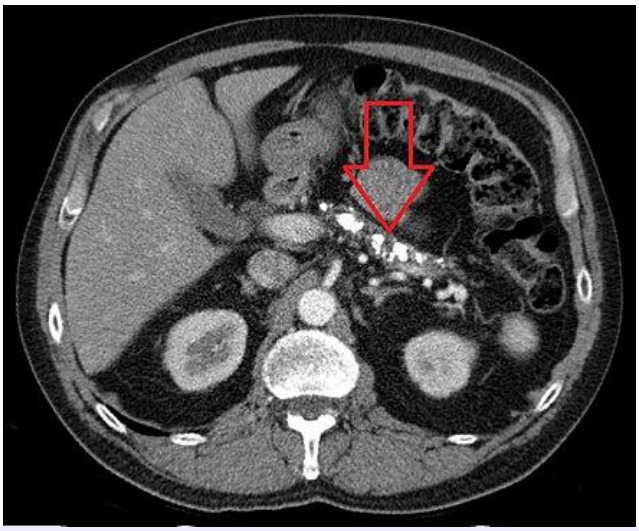
b. It reduces the risk of infection
c. It is easier to administer
d. It provides more calories
e. It reduces the risk of relapse

10. Which sign is characterized by ecchymosis of the flanks and is associated with severe acute pancreatitis?

a. Grey-Turner's sign
b. Cullen's sign
c. Grünwald sign
d. Körte's sign
e. Mayo-Robson's point

Chronic Pancreatitis

Chronic pancreatitis is a long-standing inflammation of the pancreas that alters its normal structure and functions. Unlike acute pancreatitis, which involves reversible changes, chronic pancreatitis is characterised by irreversible damage to the pancreas.
The condition can lead to persistent pain, malabsorption, and various complications, including pancreatic cancer. Tobacco smoke and alcohol misuse are the most frequently implicated causes, often having a synergistic effect.



Axial CT showing multiple calcifications in the pancreas in a patient with chronic pancreatitis

Signs and Symptoms

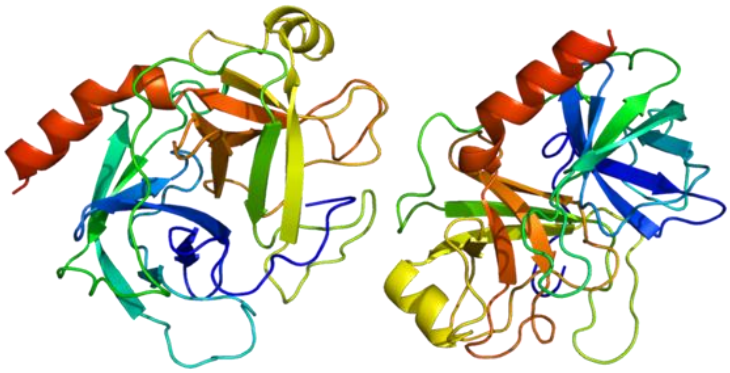
Patients with chronic pancreatitis may present with a range of symptoms, the most common being upper abdominal pain, which typically worsens after eating or drinking but may lessen when fasting or leaning forward. Nausea and vomiting are also prevalent. Due to reduced production of pancreatic enzymes, malabsorption can occur, leading to steatorrhea, which involves frequent, oily, foul-smelling bowel movements. Weight loss is common even with normal eating habits. Additionally, chronic pancreatitis can impair insulin production, leading

to Type 3c diabetes, which is characterized by symptoms such as increased hunger and thirst, frequent urination, weight loss, fatigue, and blurry vision.

Causes

The most common causes of chronic pancreatitis include chronic alcohol misuse and smoking. Genetic factors account for approximately 10% of cases, involving mutations in genes like CFTR, SPINK1, and CTRC. Chronic pancreatitis can also be idiopathic, autoimmune, or due to intraductal obstruction, tumours, ischaemia, or calcific stones. Hereditary pancreatitis, which involves a mutation of the Trypsin 1 gene, is less common but notable.

Pathophysiology



PRSS1

The pathophysiology of chronic pancreatitis often involves genetic mutations, such as in the PRSS1 gene, which can lead to early onset of severe epigastric pain. Environmental factors like alcohol, malnutrition, and smoking also play significant roles. Chronic inflammation leads to fibrosis, calcification, and atrophy of the pancreas, disrupting its exocrine and endocrine functions.

Diagnosis

Diagnosis of chronic pancreatitis is based on clinical history, symptomatology, and radiologic imaging. Serum amylase and lipase levels may be moderately elevated. Symptoms like oily, bulky, and foul-smelling stools indicate steatorrhea and can be confirmed by checking faecal elastase levels or a quantitative faecal fat test. Genetic causes may be identified through elevated ESR, IgG4, rheumatoid factor, ANA, and anti-smooth muscle antibody levels. Imaging techniques such as CT scans, MRCP, and EUS are employed to detect calcifications, ductal changes, and atrophy. MRI scans may reveal a low T1 signal, indicating inflammation and fibrosis.

Treatment

Treatment for chronic pancreatitis includes medical measures, therapeutic endoscopy, and surgery. Pain management is very important and often requires analgesics, including opiates, pregabalin, gabapentin, tricyclic antidepressants, and SNRIs. Abstaining from alcohol and smoking is essential. Antioxidants may offer some benefit, although their efficacy is uncertain. Endoscopic treatments, such as stone removal and ductal dilation, may be employed. Extracorporeal shockwave lithotripsy can also be used to break down pancreatic stones.

Pancreatic Enzymes

Pancreatic enzyme replacement therapy is effective for treating malabsorption and steatorrhea. Administering a solution of pancreatic enzymes with meals can reduce symptoms and improve nutritional status. Enzyme replacement may also alleviate pain, particularly in patients without large duct involvement.

Surgery

Surgical options for chronic pancreatitis include resectional and drainage procedures. Indications for surgery include pseudocysts, fistulas, ascites, or fixed obstructions. Procedures such as the Puestow procedure, pancreaticoduodenectomy, and total pancreatectomy may be performed, depending on the patient's condition and response to other treatments.

Epidemiology

The annual incidence of chronic pancreatitis ranges from 5 to 12 per 100,000 persons, with a prevalence of 50 per 100,000. Environmental factors, including radioactive cesium contamination, may contribute to the development of chronic pancreatitis and pancreatic cancer.

Self-assessment MCQs (select the best answer)

1. **What is the primary distinguishing feature between acute and chronic pancreatitis?**

a. Acute pancreatitis involves irreversible damage while chronic pancreatitis involves reversible changes
b. Chronic pancreatitis involves irreversible damage while acute pancreatitis involves reversible changes
c. Both involve irreversible damage
d. Both involve reversible changes
e. Chronic pancreatitis is always painless

2. **Which two lifestyle factors are most frequently implicated in the development of chronic pancreatitis?**

a. High-fat diet and sedentary lifestyle
b. Chronic alcohol misuse and smoking
c. Lack of sleep and high sugar intake
d. Excessive caffeine consumption and dehydration
e. Vegan diet and high fibre intake

3. **Which symptom is commonly associated with chronic pancreatitis and is characterized by frequent, oily, foul-smelling bowel movements?**

a. Hematuria
b. Steatorrhea
c. Hemoptysis
d. Diarrhoea
e. Constipation

4. **What type of diabetes is commonly associated with chronic pancreatitis?**

a. Type 1 diabetes
b. Type 2 diabetes

c. Type 3 diabetes
d. Type 3c diabetes
e. Gestational diabetes

5. Which gene mutation is associated with hereditary pancreatitis?
a. BRCA1
b. CFTR
c. PRSS1
d. SPINK1
e. HLA-B27

6. What imaging technique is frequently used to detect calcifications, ductal changes, and atrophy in chronic pancreatitis?
a. X-ray
b. Ultrasound
c. CT scan
d. PET scan
e. Bone scan

7. Which treatment is effective for alleviating malabsorption and steatorrhea in patients with chronic pancreatitis?
a. Antioxidants
b. Pancreatic enzyme replacement therapy
c. Insulin therapy
d. Radiation therapy
e. Chemotherapy

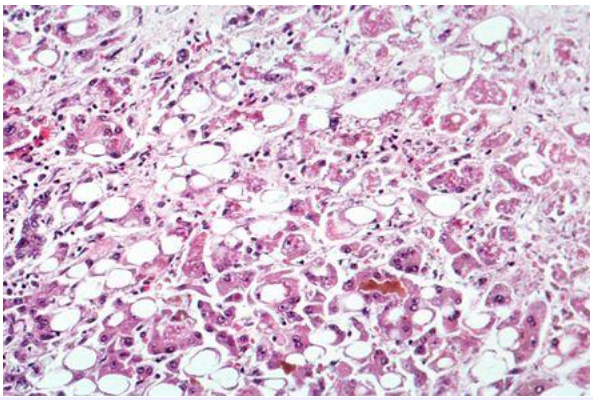
8. What is the annual incidence of chronic pancreatitis per 100,000 persons?
a. 1 to 2
b. 3 to 4
c. 5 to 12
d. 13 to 20
e. 21 to 30

9. Which surgical procedure may be performed for chronic pancreatitis and involves the drainage of the pancreatic duct?
a. Cholecystectomy
b. Whipple procedure
c. Puestow procedure
d. Appendectomy
e. Colectomy

10. Which of the following is a genetic test marker that may be elevated in cases of autoimmune chronic pancreatitis?
a. ESR
b. IgG4
c. Rheumatoid factor
d. ANA
e. All of the above

Hepatitis

Hepatitis is an inflammation of the liver tissue, which can be either acute or chronic. Acute hepatitis resolves within six months, while chronic hepatitis persists longer.
The condition may be asymptomatic or present symptoms such as jaundice, poor appetite, abdominal pain, and fatigue.



Microscopic view of alcoholic hepatitis showing fatty changes, dead liver cells, and Mallory bodies.

Causes

Hepatitis can result from various factors, including viral infections, alcohol, toxins, medications, and autoimmune diseases. The primary viral causes are hepatitis viruses A, B, C, D, and E.
Other infections like cytomegalovirus and Epstein–Barr virus can also cause hepatitis. Hepatitis A and E are mainly spread through contaminated food and water, while hepatitis B, C, and D are transmitted through infected blood and bodily fluids.

Viral Hepatitis

Hepatitis A and E are acute, often resolving on their own. Hepatitis B and C can become chronic, leading to severe complications like cirrhosis and liver cancer.

Hepatitis D requires co-infection with hepatitis B to replicate.

Non-Viral Causes

Excessive alcohol consumption can cause alcoholic hepatitis, leading to liver cirrhosis over time. Medications and toxins can also induce hepatitis through various mechanisms.

Autoimmune hepatitis arises from an abnormal immune response against liver cells.

Signs and Symptoms

Acute Hepatitis

Acute viral hepatitis has three phases:

1. **Prodromal Phase**: Flu-like symptoms, fatigue, nausea, and choluria (dark urine).
2. **Icteric Phase**: Jaundice, enlarged liver, and right upper abdominal pain.
3. **Recovery Phase**: Resolution of symptoms, but liver lab values may remain elevated.

Jaundiced eyes indicative of hepatitis.

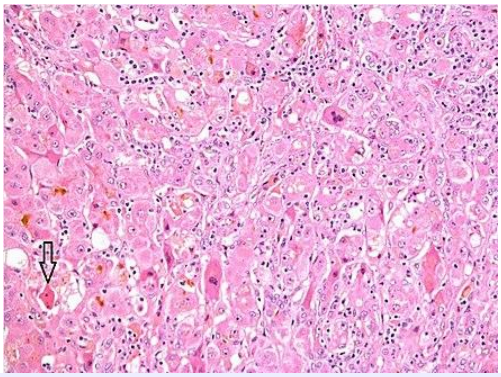
Chronic Hepatitis

Chronic hepatitis may be asymptomatic initially but can lead to symptoms like fatigue, jaundice, and joint pain as liver damage progresses. Complications include cirrhosis, liver failure, and liver cancer.

Diagnosis

Diagnosis involves clinical assessment, blood tests, imaging, and sometimes liver biopsy. Blood tests typically show elevated liver enzymes (AST and ALT).

Viral hepatitis is confirmed through specific viral antigens and antibodies in the blood. Imaging can identify liver abnormalities, but liver biopsy remains the definitive test for inflammation and fibrosis.



Histopathology of acute hepatitis showing lobular disarray and lymphocytic inflammation.

Treatment

General Management

Treatment varies based on the type and severity of hepatitis. General recommendations include rest, adequate nutrition, and avoiding liver-metabolised drugs.

Viral Hepatitis

- **Hepatitis A and E**: Usually self-limiting; supportive care is provided.
- **Hepatitis B**: Acute cases often resolve on their own; chronic cases require antiviral medications like entecavir or tenofovir.
- **Hepatitis C**: Treated with direct-acting antivirals aiming for sustained virological response (SVR).
- **Hepatitis D**: Difficult to treat; interferon alpha may be used.

Non-Viral Hepatitis

- **Alcoholic Hepatitis**: Abstinence from alcohol is very important. Severe cases may require corticosteroids or pentoxifylline.
- **Autoimmune Hepatitis**: Treated with corticosteroids and immunosuppressants like azathioprine.

Prevention

Vaccination

Vaccines are available for hepatitis A and B. Hepatitis A vaccination is recommended for children and high-risk adults.

Hepatitis B vaccination is part of routine immunisation in many countries.

Lifestyle Modifications

Avoiding excessive alcohol, practising safe sex, and ensuring proper hygiene can prevent hepatitis. Needle exchange programmes and screening blood products are essential in reducing hepatitis B and C transmission.

Hepatitis is a significant global health concern with various causes and manifestations. Early diagnosis, effective treatment, and preventive measures like vaccination can mitigate the impact of hepatitis on affected populations.

Self-assessment MCQs (select the best answer)

1. Which hepatitis virus requires co-infection with another virus to replicate?

a. Hepatitis A
b. Hepatitis B
c. Hepatitis C
d. Hepatitis D
e. Hepatitis E

2. What is the primary mode of transmission for hepatitis A and E?

a. Blood transfusion
b. Sexual contact
c. Contaminated food and water
d. Sharing needles
e. Insect bites

3. Which phase of acute hepatitis is characterised by jaundice and right upper abdominal pain?

a. Prodromal phase
b. Icteric phase
c. Recovery phase
d. Chronic phase
e. Fulminant phase

4. What is the most common cause of cirrhosis in the United States?

a. Hepatitis A
b. Hepatitis B

c. Hepatitis C
d. Alcoholic hepatitis
e. Non-alcoholic steatohepatitis (NASH)

5. Which of the following is NOT a common cause of hepatitis?
a. Viral infection
b. Autoimmune disease
c. Excessive alcohol consumption
d. Vitamin C overdose
e. Certain medications

6. Which blood test result is most indicative of alcoholic hepatitis?
a. ALT>AST with a ratio of ALT:AST>1.5:1
b. AST>ALT with a ratio of AST:ALT>2:1
c. Elevated bilirubin levels only
d. Presence of hepatitis B surface antigen (HBsAg)
e. Elevated IgE levels

7. What is the treatment goal for chronic hepatitis B?
a. Eradication of the virus
b. Prevention of liver cancer only
c. Suppression of viral replication
d. Symptomatic relief only
e. Immediate liver transplantation

8. Which autoimmune marker is most commonly associated with autoimmune hepatitis?
a. Anti-HBs
b. Anti-HCV
c. Anti-HAV
d. Anti-nuclear antibody (ANA)
e. Anti-HDV

9. What is the primary preventive measure for hepatitis A?
a. Avoiding alcohol consumption
b. Regular exercise
c. Vaccination
d. Taking antiviral medications
e. Frequent hand washing

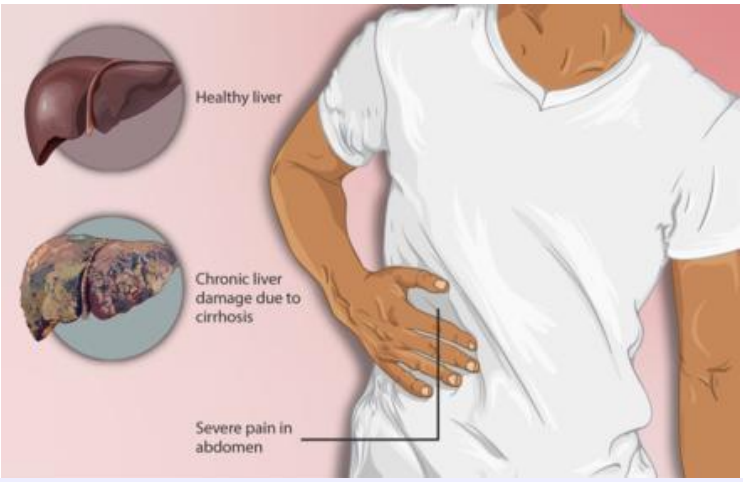
10. What is the definitive diagnostic test for assessing inflammation and fibrosis in hepatitis?
a. Ultrasound
b. CT scan
c. MRI
d. Liver biopsy
e. Blood test

Cirrhosis

Cirrhosis is a chronic liver disease characterised by fibrosis, which impairs liver function and can lead to end-stage liver disease. It develops slowly over months or years as scar tissue replaces normal liver tissue, causing impaired liver function. This disease can result from alcoholic liver disease, hepatitis B and C, non-alcoholic steatohepatitis (NASH), and other conditions.

Signs and Symptoms

Cirrhosis can take a long time to develop, with early symptoms including tiredness, weakness, loss of appetite, weight loss, and nausea. As the disease progresses, symptoms may include itchiness, swelling in the lower legs, fluid build-up in the abdomen (ascites), jaundice, easy bruising, and the development of spider-like blood vessels in the skin. Advanced cirrhosis can lead to complications such as hepatic encephalopathy, gastrointestinal bleeding from dilated veins, and liver cancer.

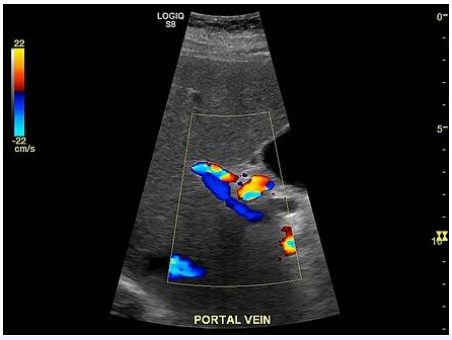


Person with cirrhosis and associated pain in the right upper region of the abdomen

Diagnosis

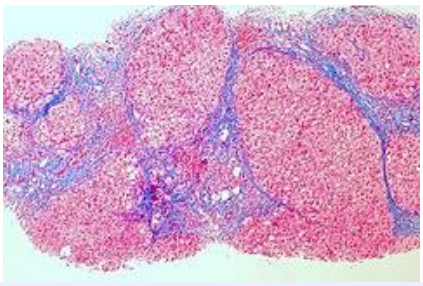
Diagnosis of cirrhosis involves a combination of blood tests, medical imaging, and sometimes liver biopsy. Imaging techniques like ultrasound, CT scans, and MRI help assess liver structure and function. Ultrasound may show a small, shrunken liver in advanced disease and can also screen for hepatocellular carcinoma. Elastography techniques measure liver stiffness, which helps determine the extent of fibrosis.

Caudate lobe hypertrophy on ultrasound due to cirrhosis



Hepatofugal (non-forward) flow in portal vein

Laboratory findings can include elevated liver enzymes (AST and ALT), low platelet count, increased bilirubin, and prolonged prothrombin time. The Bonacini score helps evaluate cirrhosis severity based on platelet count, ALT/AST ratio, and INR.



Trichrome stain, showing cirrhosis as a nodular texture surrounded by fibrosis (wherein collagen is stained blue)

Treatment

While liver damage from cirrhosis is often irreversible, treatment aims to stop or delay further progression and manage complications. A healthy diet with high protein and fibre is encouraged, along with frequent follow-ups. Avoiding alcohol is very important, especially in alcoholic cirrhosis. Medications can help manage symptoms and complications such as itching, infections, and fluid build-up. Ursodiol may be useful if the disease is due to bile duct blockage.

For underlying causes like hepatitis B and C, antiviral medications can slow disease progression. In cases of iron overload, chelation therapy or bloodletting is used. For those with Wilson's disease, copper removal through chelation therapy is necessary. In severe cases, liver transplantation may be required.

Preventing Further Liver Damage

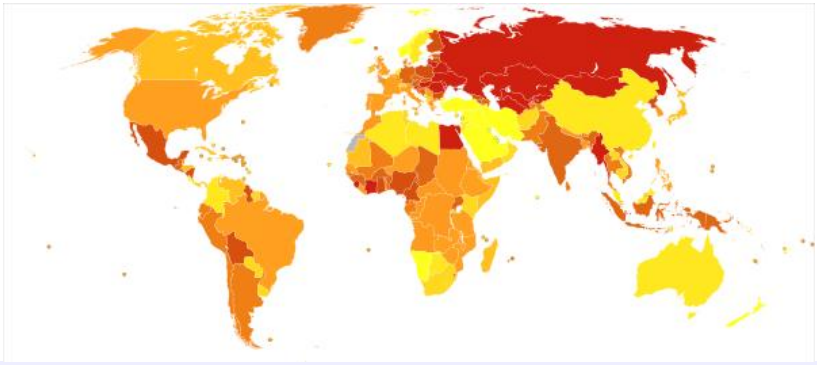
Avoiding alcohol and other hepatotoxic substances is essential. Vaccination against hepatitis B and management of conditions like diabetes and hypertension can prevent further liver damage. Certain medications may need dose adjustments to reduce liver stress.

Decompensated Cirrhosis

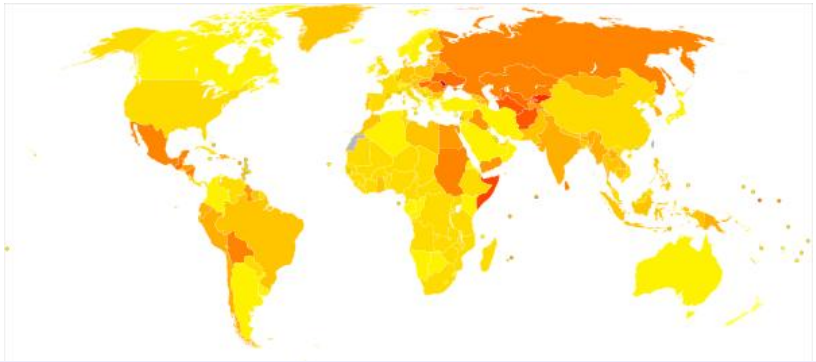
Patients with decompensated cirrhosis, marked by complications such as gastrointestinal bleeding, hepatic encephalopathy, and ascites, often require hospitalization. Treatment includes diuretics, antibiotics, laxatives, and sometimes steroids. Liver transplantation may be necessary for those who cannot be stabilized.

Palliative Care

Palliative care aims to improve quality of life by managing symptoms such as abdominal swelling, itching, and pain. Discussions about healthcare power of attorney and life support are also essential, as cirrhosis is incurable without a transplant.



Cirrhosis deaths per million persons in 2012



Disability-adjusted life year for cirrhosis of the liver per 100,000 inhabitants in 2004

Self-assessment MCQs (select the best answer)

1. **Which of the following is NOT a common cause of cirrhosis?**

a. Alcoholic liver disease
b. Hepatitis B and C
c. Non-alcoholic steatohepatitis (NASH)
d. Hypertension
e. Wilson's disease

2. **Which symptom is generally associated with the early stages of cirrhosis?**

a. Jaundice
b. Fluid build-up in the abdomen (ascites)
c. Easy bruising
d. Weight loss
e. Spider-like blood vessels in the skin

3. **What diagnostic technique measures liver stiffness to assess the extent of fibrosis?**

a. Ultrasound
b. CT scan
c. MRI

d. Elastography
e. Liver biopsy

4. Which lab finding is NOT commonly associated with cirrhosis?
a. Elevated liver enzymes (AST and ALT)
b. Low platelet count
c. Increased bilirubin
d. Decreased blood urea nitrogen (BUN)
e. Prolonged prothrombin time

5. Which medication may be useful for cirrhosis due to bile duct blockage?
a. Ursodiol
b. Diuretics
c. Steroids
d. Antivirals
e. Chelation therapy

6. Which of the following is a complication of decompensated cirrhosis?
a. Hepatic encephalopathy
b. Weight loss
c. Nausea
d. Loss of appetite
e. Itchiness

7. What is a primary goal of palliative care in cirrhosis patients?
a. Cure the disease
b. Reverse liver fibrosis
c. Improve quality of life
d. Increase protein intake
e. Diagnose underlying conditions

8. Which treatment is NOT typically used to manage symptoms and complications of cirrhosis?
a. Antivirals for hepatitis B and C
b. Bloodletting for iron overload
c. Diuretics for ascites
d. High-dose steroids for all cases
e. Chelation therapy for Wilson's disease

9. What is the Bonacini score used for in cirrhosis patients?
a. Determine liver stiffness
b. Evaluate cirrhosis severity
c. Measure bilirubin levels
d. Assess liver cancer risk
e. Diagnose bile duct blockage

10. Which prevention strategy is NOT recommended for cirrhosis patients to avoid further liver damage?
a. Avoiding alcohol
b. Vaccination against hepatitis B

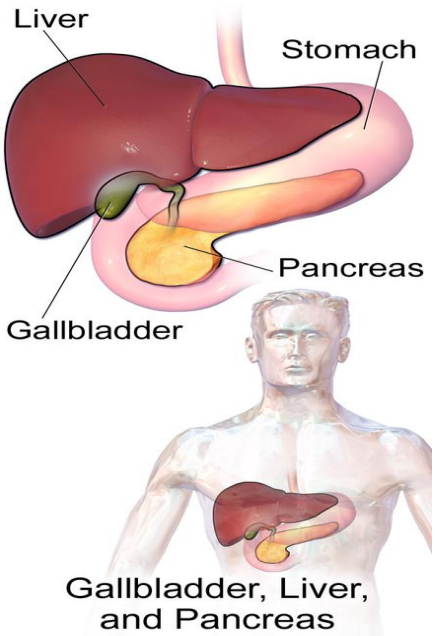
c. Management of diabetes and hypertension
d. Increasing carbohydrate intake
e. Dose adjustments of certain medications

Cholecystitis

Cholecystitis is the inflammation of the gallbladder, primarily caused by gallstones blocking the cystic duct. This condition predominantly affects adults and has a higher prevalence in women, particularly those over 40. The gallbladder can also become inflamed due to severe illness, vasculitis, or chemotherapy. If untreated, cholecystitis can lead to severe complications, including gallbladder rupture, gangrene, and fistula formation.

Signs and Symptoms

Cholecystitis often presents with intense right upper abdominal pain which can radiate to the right shoulder. Nausea, vomiting, and fever are common accompanying symptoms. The pain associated with cholecystitis is more severe and persistent than that of typical biliary colic, which is episodic and often triggered by fatty meals. Physical examination typically reveals tenderness in the midclavicular right lower rib margin, and in some cases, a palpable gallbladder. Murphy's sign, where deep inspiration worsens the pain during palpation of the right upper quadrant, is a key diagnostic indicator. Jaundice may occur but is usually mild unless complications like choledocholithiasis are present.



Location of the gallbladder

Complications

Cholecystitis can lead to several serious complications if not treated promptly. These include:

- **Gangrene and Gallbladder Rupture**: Decreased blood flow to the gallbladder can cause tissue death, leading to gangrene and potentially rupture, which is life-threatening.

- **Empyema**: Infection and pus accumulation in the gallbladder can result in high fever and severe abdominal pain.
- **Fistula Formation and Gallstone Ileus**: Inflammation can cause abnormal connections between the gallbladder and gastrointestinal tract, leading to intestinal obstruction by gallstones.

Causes

The primary cause of cholecystitis is gallstones, accounting for 90% of cases. Risk factors for gallstones include female sex, age, pregnancy, oral contraceptives, obesity, and diabetes mellitus. In some cases, cholecystitis can develop without gallstones (acalculous cholecystitis), often in critically ill patients. This form of cholecystitis is associated with high morbidity and requires prompt treatment.

Mechanism

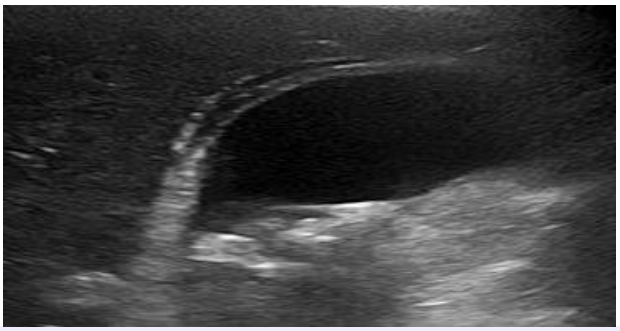
The blockage of the cystic duct by a gallstone leads to bile buildup, increased pressure, and inflammation of the gallbladder. This can result in bacterial infection, further exacerbating inflammation and potentially reducing blood flow, leading to tissue death.

Diagnosis

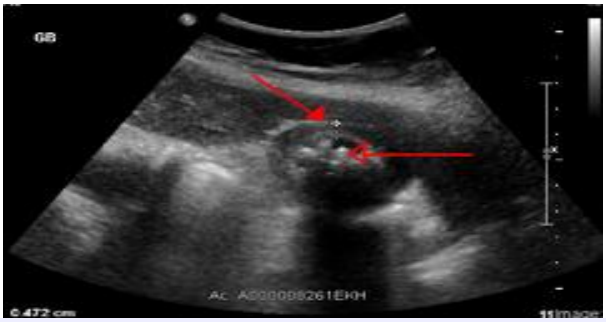
Diagnosis of cholecystitis is based on clinical presentation, laboratory tests, and imaging studies. Laboratory tests typically show elevated white blood cell count and C-reactive protein, indicating inflammation. Bilirubin levels may be mildly elevated.

Imaging

Ultrasound is the primary imaging modality used to diagnose cholecystitis, revealing gallstones, pericholecystic fluid, and gallbladder wall thickening. Computed tomography (CT) and hepatic iminodiacetic acid (HIDA) scans can also be used, especially if complications are suspected.



Abdominal ultrasonography showing gallstones, wall thickening and fluid around the gall bladder

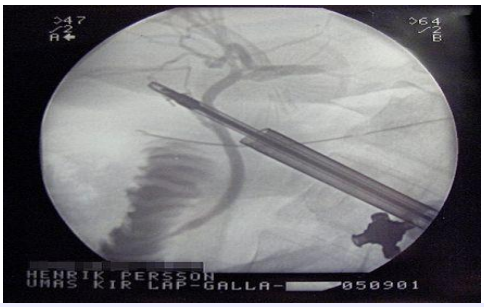


Acute cholecystitis as seen on ultrasound. The closed arrow points to gallbladder wall thickening. Open arrow points to stones in the GB

Treatment

Surgery

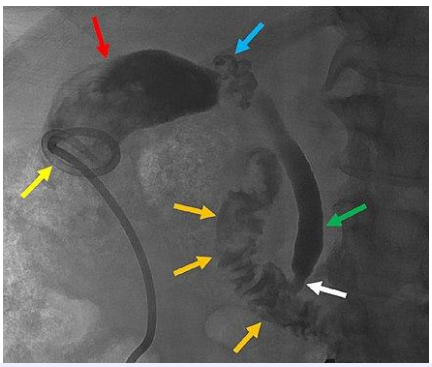
The primary treatment for acute cholecystitis is laparoscopic cholecystectomy, performed within 24 hours if possible. This minimally invasive surgery has better outcomes than open cholecystectomy, including less postoperative pain and fewer complications. Early removal of the gallbladder within the first week of symptom onset is preferred.



X-ray during laparoscopic cholecystectomy

Other Treatments

Supportive measures, such as fluid resuscitation and intravenous pain management, are essential. Antibiotics may be used to target enteric organisms if surgery cannot be performed immediately or if there are signs of severe infection. In cases where surgery poses a high risk, percutaneous gallbladder drainage might be considered, followed by delayed cholecystectomy once the patient's condition stabilizes.



Radiography of a percutaneous drainage catheter (yellow arrow)

Self-assessment MCQs (select the best answer)

1. **What is the primary cause of cholecystitis?**
a. Viral infection
b. Bacterial infection
c. Gallstones blocking the cystic duct
d. Autoimmune disease
e. Trauma

2. **Which population is most commonly affected by cholecystitis?**
a. Children under 12
b. Men over 60
c. Women over 40
d. Adolescents
e. Newborns

3. **What is a key diagnostic indicator of cholecystitis during a physical examination?**
a. Cullen's sign
b. McBurney's point tenderness
c. Murphy's sign
d. Grey Turner's sign
e. Babinski reflex

4. **Which imaging modality is primarily used to diagnose cholecystitis?**
a. MRI
b. X-ray
c. Ultrasound
d. PET scan
e. Echocardiogram

5. **What complication involves the accumulation of pus in the gallbladder?**
a. Gangrene
b. Empyema
c. Fistula formation
d. Gallstone ileus
e. Peritonitis

6. **Which of the following is a common symptom of cholecystitis?**
a. Intense left lower abdominal pain
b. Intense right upper abdominal pain radiating to the right shoulder
c. Generalised itching
d. Frequent urination
e. Severe headache

7. **What is the preferred treatment for acute cholecystitis?**
a. Antibiotics alone
b. Fasting and hydration
c. Laparoscopic cholecystectomy
d. Chemotherapy

e. Radiation therapy

8. Which of the following is NOT a risk factor for gallstones?
a. Female sex
b. Obesity
c. Diabetes mellitus
d. Smoking
e. Pregnancy

9. Which complication involves the formation of an abnormal connection between the gallbladder and gastrointestinal tract?
a. Empyema
b. Gangrene
c. Fistula formation
d. Perforation
e. Cholangitis

10. What laboratory finding is commonly elevated in cholecystitis?
a. Red blood cell count
b. Platelet count
c. White blood cell count
d. Blood glucose level
e. Calcium level

Gallstone Disease

Gallstone disease, also known as cholelithiasis or choledocholithiasis, refers to the formation of stones within the gallbladder or bile ducts from precipitated bile components. These stones can lead to significant medical conditions, especially when they obstruct the biliary system.

Signs & Symptoms

Most people with gallstones are asymptomatic. However, symptomatic gallstones can cause intense cramp-like visceral pain in the right upper abdomen known as biliary colic or gallbladder attack. This pain is often accompanied by nausea and vomiting, and it may radiate to the tip of the scapula, known as "Collin's sign". Symptomatic gallstones can also cause fever, referred pain between the shoulder blades, and jaundice if bilirubin leaks into the bloodstream. Gallbladder attacks frequently occur after heavy meals, particularly in the evening or at night.

Other Complications

Complications from gallstones include cholecystitis (inflammation of the gallbladder), pancreatitis (inflammation of the pancreas), obstructive jaundice, cholangitis (infection of the bile ducts), and rarely, gallbladder cancer. Severe cases can lead to gallstone ileus, an obstruction caused by a gallstone eroding into the bowel.

Risk Factors

Factors increasing the risk of gallstones include female gender, age over 40, obesity, diabetes, rapid weight loss, pregnancy, and certain ethnicities such as Native Americans. Nutritional risk factors include a diet low in fibre, high in simple carbohydrates, and low in essential nutrients

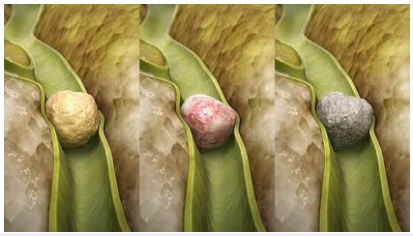
like folate, magnesium, and vitamin C. Prolonged use of proton pump inhibitors, certain medications (e.g., statins and fibrates), and conditions like Gilbert syndrome and celiac disease also increase the risk.

Pathophysiology and Composition

Gallstones form when bile contains excessive cholesterol and insufficient bile salts. They are classified based on their composition into cholesterol stones, pigment stones, and mixed stones.

- **Cholesterol Stones**: Light yellow to dark green or brown, and composed of at least 80% cholesterol by weight.
- **Pigment Stones**: Small, dark stones primarily composed of bilirubin and calcium salts.
- **Mixed Stones**: Contain 20-80% cholesterol along with calcium compounds, and arise secondary to biliary tract infections.

Images



Types of Gallstones

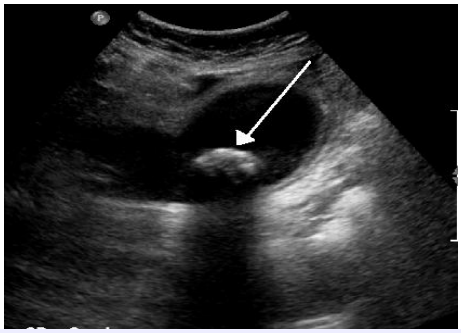
Gallbladder opened to show small cholesterol gallstones.

The large, yellow stone is largely cholesterol, while the green-to-brown stones are mostly composed of bile pigments.

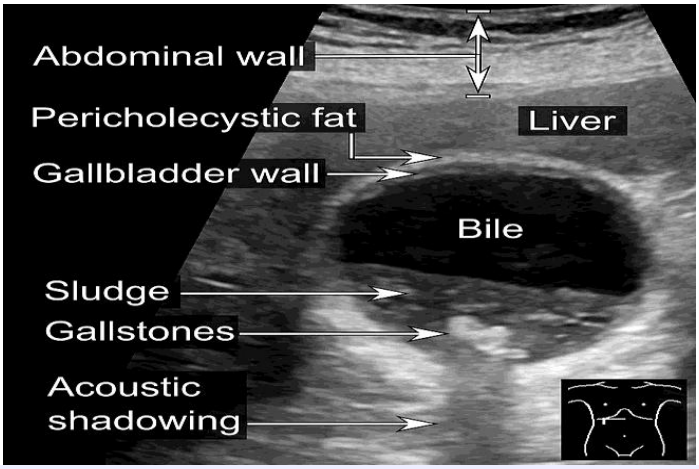
Diagnosis

Diagnosis is typically confirmed by abdominal ultrasound, which detects gallstones and associated complications. Other imaging techniques include ERCP and MRCP. Blood tests may reveal complications.

Images



A 1.9 cm gallstone impacted in the neck of the gallbladder and leading to cholecystitis as seen on ultrasound. There is 4 mm gall bladder wall thickening.



Biliary sludge and gallstones. There is borderline thickening of the gallbladder wall.

Treatment

Lithotripsy

Extracorporeal shock wave lithotripsy (ESWL) is a non-invasive method using high-energy sound waves to disintegrate gallstones. Side effects include biliary pancreatitis and liver haematoma.

Surgical

Cholecystectomy, or gallbladder removal, is the most effective treatment with a 99% success rate in eliminating recurrence. It can be performed via open surgery or laparoscopically. Laparoscopic cholecystectomy is preferred due to shorter recovery times.

Medical

Medications like ursodeoxycholic acid (UDCA) and chenodeoxycholic acid (CDCA) can dissolve small cholesterol stones. UDCA can also prevent gallstone formation during weight loss.

Images

Large gallstone.

Numerous small gallstones made up largely of cholesterol.

Use in Traditional Medicine

Gallstones, particularly from old dairy cows, are valued in traditional Chinese medicine as antipyretics and antidotes. These stones are termed calculus bovis or *niu-huang*.

Self-assessment MCQs (select the best answer)

1. **Which term is synonymous with gallstone disease?**

a. Hepatitis
b. Cholelithiasis
c. Nephrolithiasis
d. Gastritis
e. Pancreatitis

2. **What is the primary symptom of symptomatic gallstones?**

a. Headache
b. Biliary colic
c. Diarrhoea
d. Cough
e. Rash

3. **Which of the following is NOT a risk factor for gallstone formation?**

a. Obesity
b. Female gender
c. High-fibre diet
d. Diabetes
e. Rapid weight loss

4. Which imaging technique is commonly used to diagnose gallstones?
a. Electrocardiogram
b. Abdominal ultrasound
c. X-ray
d. CT scan
e. MRI

5. What type of gallstone is primarily composed of bilirubin and calcium salts?
a. Cholesterol stones
b. Pigment stones
c. Mixed stones
d. Uric acid stones
e. Oxalate stones

6. What is the preferred surgical treatment for gallstone disease?
a. Lithotripsy
b. Ursodeoxycholic acid
c. Cholecystectomy
d. Endoscopy
e. Radiation therapy

7. Which symptom is associated with a gallbladder attack and may radiate to the tip of the scapula?
a. Headache
b. Chest pain
c. Collin's sign
d. Back pain
e. Leg cramps

8. Which medication can be used to dissolve small cholesterol stones?
a. Aspirin
b. Metformin
c. Ursodeoxycholic acid (UDCA)
d. Ibuprofen
e. Omeprazole

9. What is a potential complication of gallstones that involves inflammation of the pancreas?
a. Cholecystitis
b. Pancreatitis
c. Hepatitis
d. Gastritis
e. Nephritis

10. In traditional Chinese medicine, what are gallstones from old dairy cows used as?
a. Antibiotics
b. Antipyretics and antidotes
c. Pain relievers

d. Sleep aids
e. Anti-inflammatories