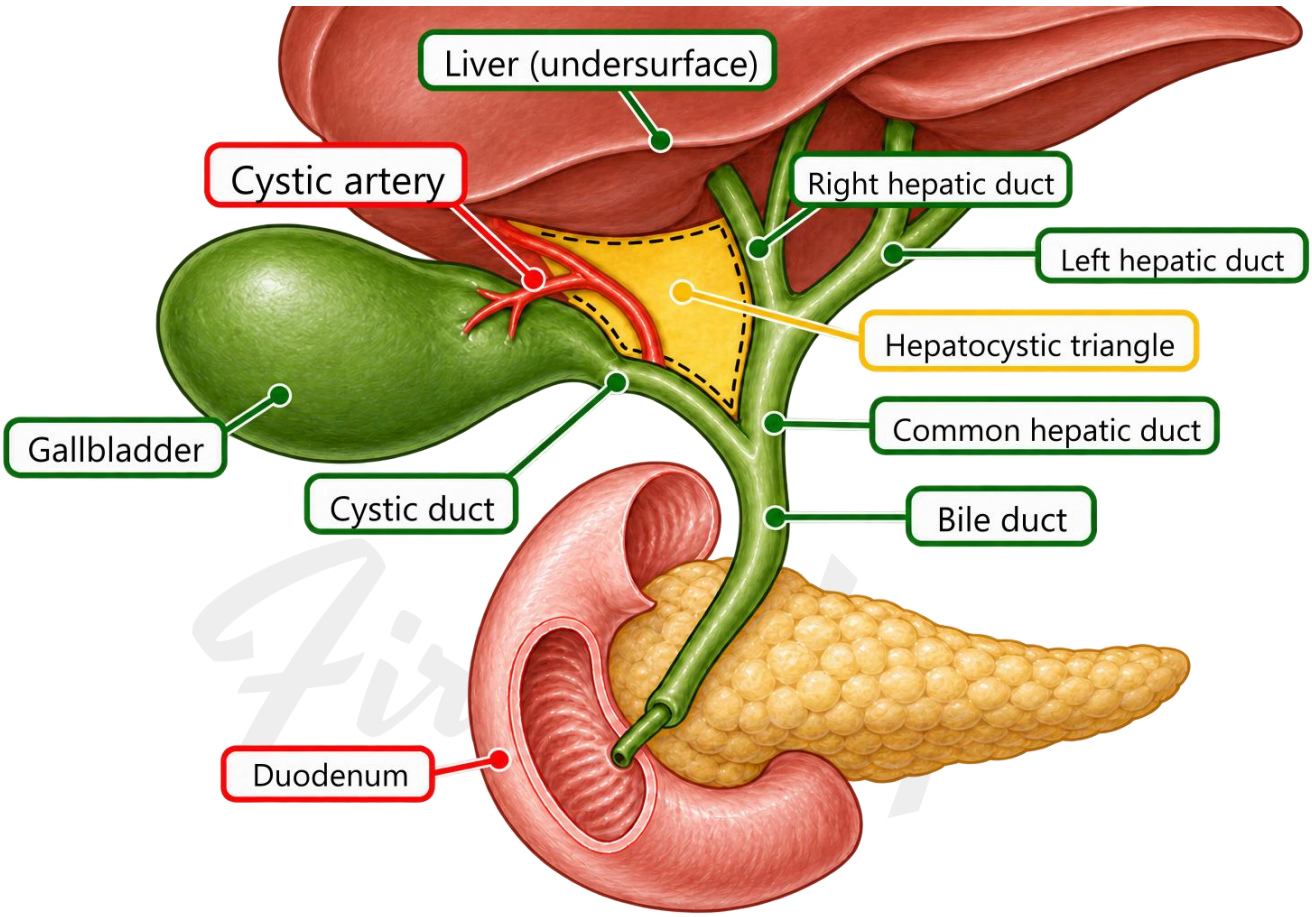
General Surgery - Topic 24 - Pancreatic disorders

Pancreatic Disorders

- The pancreas lies mainly behind the stomach and has a head within the duodenal curve, a neck, a body and a tail extending towards the spleen.

Anatomy and Functional Background



The bile duct runs close to the pancreatic head before entering the duodenum, explaining important pancreatic and biliary interactions

Anatomy and Surgical Relations

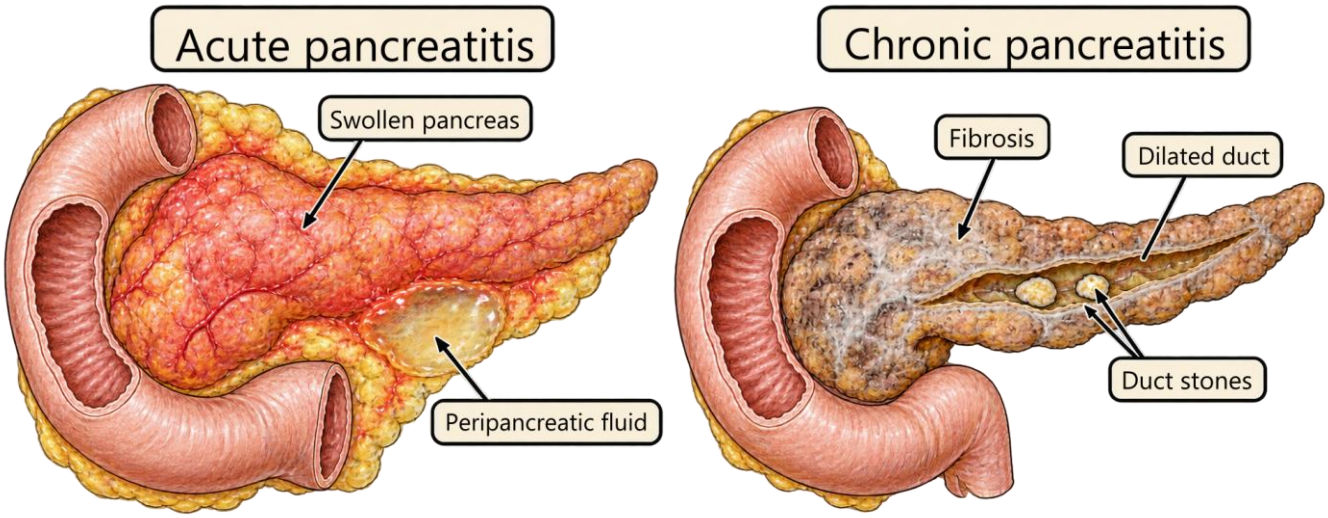
- The main pancreatic duct usually joins the bile duct near the major duodenal papilla.
- The portal vein forms behind the pancreatic neck, and major mesenteric vessels lie close to the gland.
- These relations influence tumour resectability, bleeding risk and the choice of an operation.

Exocrine and Endocrine Function

- Exocrine acinar cells produce digestive enzymes, while duct cells contribute bicarbonate-rich fluid.
- Endocrine cells produce hormones including insulin and glucagon.
- Loss of exocrine function causes maldigestion, while loss or abnormal secretion of endocrine hormones affects metabolic control.

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Overview of Acute and Chronic Pancreatitis



Acute inflammation can cause swelling and surrounding fluid, while chronic pancreatitis can cause fibrosis, duct dilatation and stones

Acute Pancreatitis

- Acute pancreatitis is an inflammatory injury of the pancreas that can involve surrounding tissues and distant organs.

Mechanism and Causes

Inflammatory Mechanism and Major Causes

- Premature enzyme activation, acinar injury and an inflammatory response contribute to tissue damage.
- Gallstones and alcohol are common causes, but the cause should be investigated rather than assumed.
- Other causes include marked hypertriglyceridaemia, selected medicines, hypercalcaemia, trauma and procedures such as ERCP.
- Anatomical abnormalities, autoimmune disease, genetic factors and obstructing tumours can be relevant in selected patients.

Biliary Obstruction

- A migrating stone can temporarily obstruct the shared outflow region even when no duct stone remains visible later.

Presentation and Diagnosis

Clinical Presentation and Severe Disease

- Typical pain is severe and persistent in the upper abdomen and may radiate to the back.
- Nausea, vomiting, tenderness, tachycardia and abdominal distension are common.
- Severe disease can cause hypoxaemia, shock, acute kidney injury or altered consciousness.

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- Periumbilical or flank bruising is an uncommon late sign and is not required for the diagnosis.

Diagnostic Criteria and Important Alternatives

- The diagnosis generally requires two of three features: characteristic pain, pancreatic enzymes at least three times the upper limit of normal, or characteristic imaging.
- Lipase is usually preferred where available, but its concentration does not reliably measure disease severity.
- Consider important alternatives such as perforation, mesenteric ischaemia, myocardial infarction and biliary disease when the presentation is atypical.
- A normal or modest enzyme value does not exclude pancreatitis in every late or unusual presentation.

Initial Investigations

Laboratory Tests and Biliary Ultrasound

- Check blood count, renal function, electrolytes, glucose, liver tests, calcium and other tests guided by severity.
- Measure triglycerides when the cause is unclear or the history suggests a lipid-related attack.
- Ultrasound assesses gallstones and biliary dilatation.

CT Timing and Duct Imaging

- Contrast CT is not routinely required immediately when the diagnosis is clear and the patient improves as expected.
- CT or other imaging is appropriate for diagnostic uncertainty, deterioration or suspected complications.
- The timing of a severity CT is selected clinically because very early imaging may underestimate necrosis.
- MRCP or endoscopic ultrasound can assess suspected duct stones when a diagnostic ERCP is avoidable.

Severity Classification

1. Mild Acute Pancreatitis

- Mild acute pancreatitis has no organ failure and no local or systemic complications.
- Most such patients improve with appropriate supportive care, but the initial assessment must still identify the cause and any early deterioration.

2. Moderately Severe Acute Pancreatitis

- Moderately severe disease has transient organ failure lasting less than 48 hours or local or systemic complications without persistent organ failure.

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- Examples include a symptomatic local collection without persistent organ failure, and these patients often need closer or longer observation.

3. Severe Acute Pancreatitis

- Severe disease has organ failure lasting more than 48 hours.
- Persistent respiratory, cardiovascular or renal failure is a major determinant of poor outcome.

Prognostic Assessment

- Serial bedside reassessment is more useful than relying on a single admission score.
- Scores such as BISAP can support risk assessment, but they do not replace review of perfusion, oxygenation and organ function.

BISAP Score

- During the first 24 hours, assign one point each for blood urea nitrogen above 25 mg/dL, impaired mental status, systemic inflammatory response syndrome, age over 60 years and a pleural effusion.
- The total ranges from 0 to 5; a higher score signals greater risk and supports closer monitoring, but it does not replace the organ-failure assessment.
- Rising urea, haemoconcentration, persistent systemic inflammation, obesity and important comorbidities can increase concern.
- Infected necrosis and sustained organ failure can cause a prolonged and high-risk course.

Ranson Criteria for Acute Pancreatitis

- Ranson scoring uses findings on admission and during the first 48 hours; each adverse criterion scores **one point**.
- The conventional original score has **11 criteria** and was developed largely in non-biliary disease.

A. Criteria Present on Admission

Variable	Adverse threshold
Age	More than 55 years.
White-cell count	More than 16,000/mm^3.
Blood glucose	More than 200 mg/dL.
Serum lactate dehydrogenase	More than 350 IU/L.
Aspartate aminotransferase	More than 250 IU/L.

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B. Criteria Developing during the First 48 Hours

Variable	Adverse threshold
Haematocrit	Fall greater than 10 percentage points.
Blood urea nitrogen	Rise greater than 5 mg/dL despite fluid treatment.
Serum calcium	Less than 8 mg/dL.
Arterial oxygen tension	PaO_2 below 60 mmHg.
Base deficit	Greater than 4 mEq/L.
Estimated fluid sequestration	More than 6 litres.

- Fluid sequestration is an estimated severity variable, not a prescribed fluid-replacement target.

Gallstone-Modified Version

- The biliary version uses admission thresholds of age over 70 years, white-cell count over 18,000/mm^3, glucose over 220 mg/dL, LDH over 400 IU/L and AST over 250 IU/L.
- During 48 hours, it uses a haematocrit fall over 10 percentage points, BUN rise over 2 mg/dL, calcium below 8 mg/dL, base deficit over 5 mEq/L and fluid sequestration over 4 litres.
- PaO_2 is omitted from that version, giving **10 criteria** rather than 11.

Interpretation and Limitations

- **Three or more criteria** indicate increased risk and justify close monitoring, but treatment must not wait for the 48-hour score.
- The score predicts risk; the revised Atlanta definition of severe acute pancreatitis still depends on **persistent organ failure**.
- Historical mortality percentages are not fixed predictions for an individual patient receiving current care.

Acute Pancreatitis: Management and Complications

Initial Management

Early Support and Monitoring

Initial Support and Fluid Strategy

- Assess airway, breathing and circulation and provide oxygen when needed.
- Give effective analgesia and antiemetic treatment while monitoring the response.

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