

Diseases of the pancreas

Biomedical Engineering - URJC

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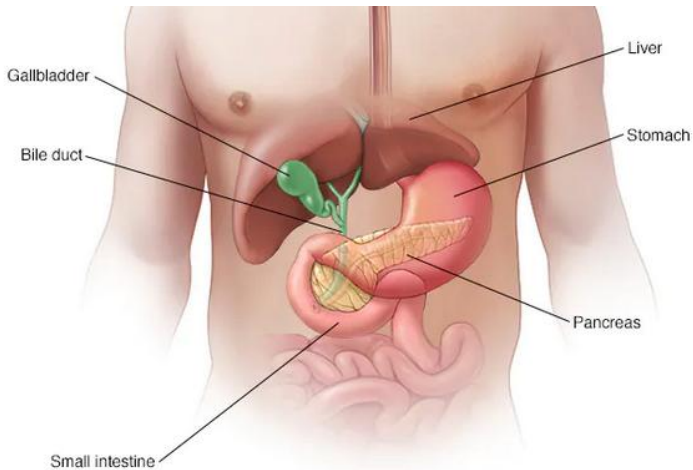
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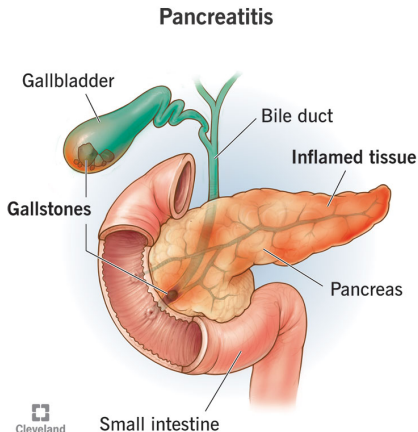
Introduction

- Pancreas: Retroperitoneal, digestive gland.



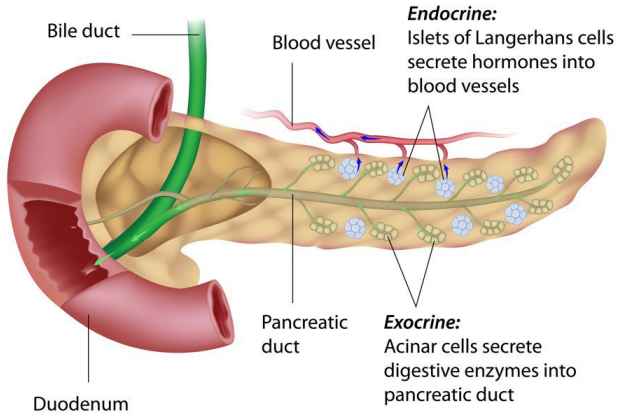
Introduction

- Structure: Head, neck, body, tail.



Introduction

- Exocrine (pancreatic juice) and endocrine (insulin, glucagon).



Clinical Significance

- **Cancer:** Pancreatic adenocarcinoma.
- **Diabetes Mellitus:**
 - Type 1: Autoimmune, insulin-secreting cells attacked.
 - Type 2: Insulin resistance and impaired secretion.
- **Inflammation:** Pancreatitis linked to gallstones, alcohol, infections.

Pancreatitis

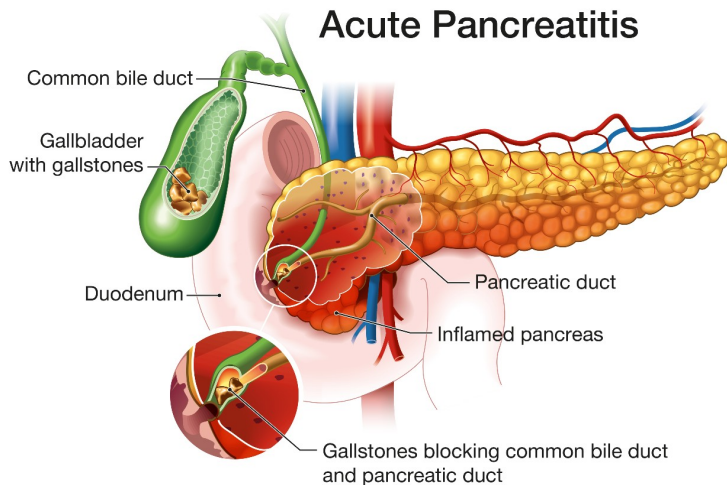
- **Acute Pancreatitis:**

- Causes: Gallstones, alcohol, autoimmune factors.
- Pathophysiology: Auto-digestion, inflammation.

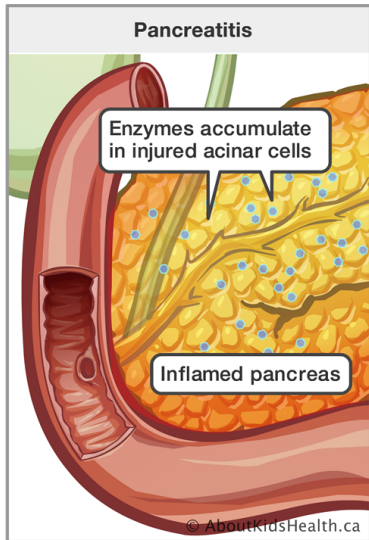
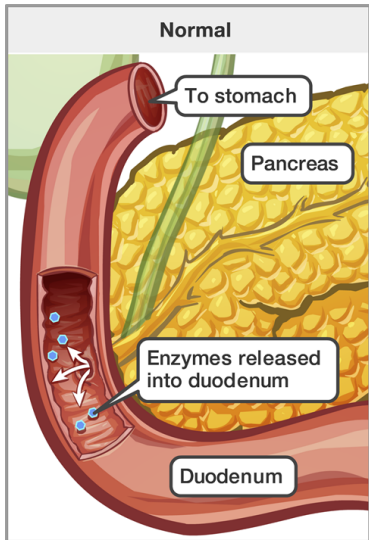
- **Chronic Pancreatitis:**

- Causes: Ethanol abuse.
- Characterized by fibrosis, calcifications.

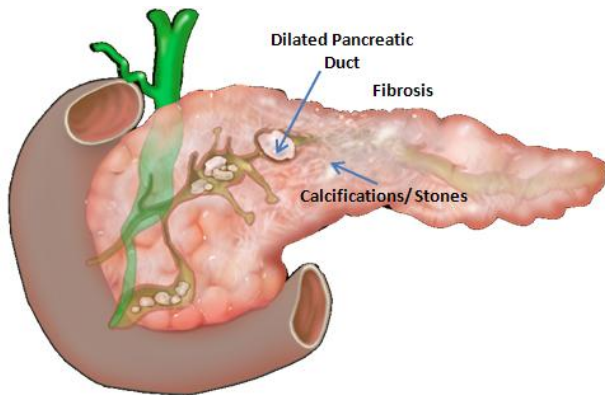
Acute Pancreatitis



Acute Pancreatitis



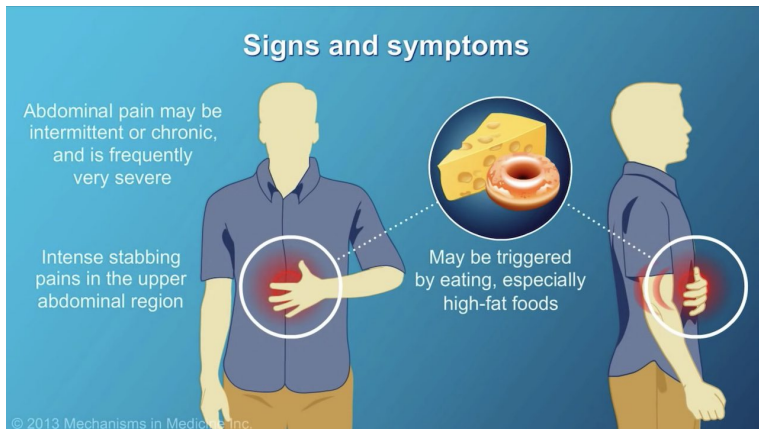
Chronic Pancreatitis



History and Physical Examination

- **Acute Pancreatitis:** Severe abdominal pain, nausea, vomiting.
- **Chronic Pancreatitis:** Episodes of pain, steatorrhea, weight loss.

History and Physical Examination



Diagnosis

- **Laboratory Parameters:** CBC, lipase, triglycerides, CRP.
- **Abdominal Imaging:** Ultrasound, CT, MRI.

Pancreatitis - Diagnosis

2 of the Following:

1. Lipase

- 3x upper limit of normal

2. Abdominal Pain

- Consistent with pancreatitis

3. Abdominal Imaging

- Findings of pancreatitis
- Imaging does not need to be performed in every patient with pancreatitis

Other Considerations:

1. Liver Function Tests

- AST/ALT ratio > 2 could suggest alcohol hx
- Elevated alkaline phosphatase could suggest biliary obstruction/gallstones
- AST, ALT, and bilirubin may be elevated with biliary obstruction as well

2. Assess Underlying Cause

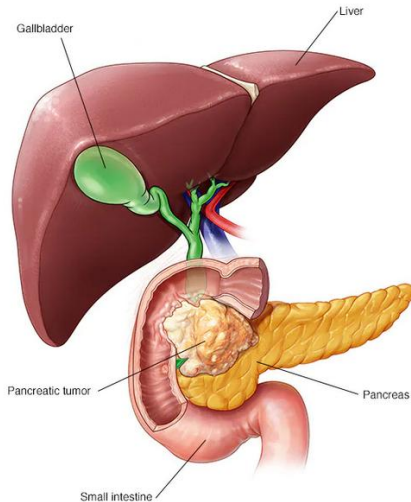
- Ultrasound for gallstones
- Ask about alcohol use
- Obtain triglyceride level

Pancreatic cancer

Pancreatic cancer (I)

- Pancreatic cancer is the fourth leading cause of cancer deaths in developed countries.
- Low 5-year survival rate (5 %-15 %) with an overall survival rate of 6 %.
- Surgical resection is the only curative option, applicable to 20 % of cases at diagnosis.

Pancreatic cancer



Pancreatic cancer

Pancreatic cancer (II)

- Risk factors: heavy alcohol and coffee consumption, physical inactivity, high red meat intake, and frequent soft drink consumption.
- More than 90 % of cases are duct cell adenocarcinomas.
- Commonly associated tumor markers: CEA and CA 19-9.

Pancreatic cancer

Pancreatic cancer (III)

- Clinical presentation includes painless jaundice (70 %), weight loss (90 %), abdominal pain (75 %), and other symptoms.
- Laboratory findings: elevated liver function tests, bilirubin, amylase, lipase, and pancreatic tumor markers.
- Locally advanced cases are unresectable; neoadjuvant treatment with chemotherapy and/or radiation is preferred.

Treatment and Management

- 1 **Acute Pancreatitis:** Aggressive fluid resuscitation, pain management.
- 2 **Chronic Pancreatitis:** Pain control, alcohol cessation, enzyme replacement.
- 3 **Pancreatic Cancer:** Surgery for cure, neoadjuvant treatment for unresectable cases.