

# Acute and chronic pancreatitis

By Josefine Holum

- Physiology of the pancreas
- Acute pancreatitis
- Chronic pancreatitis

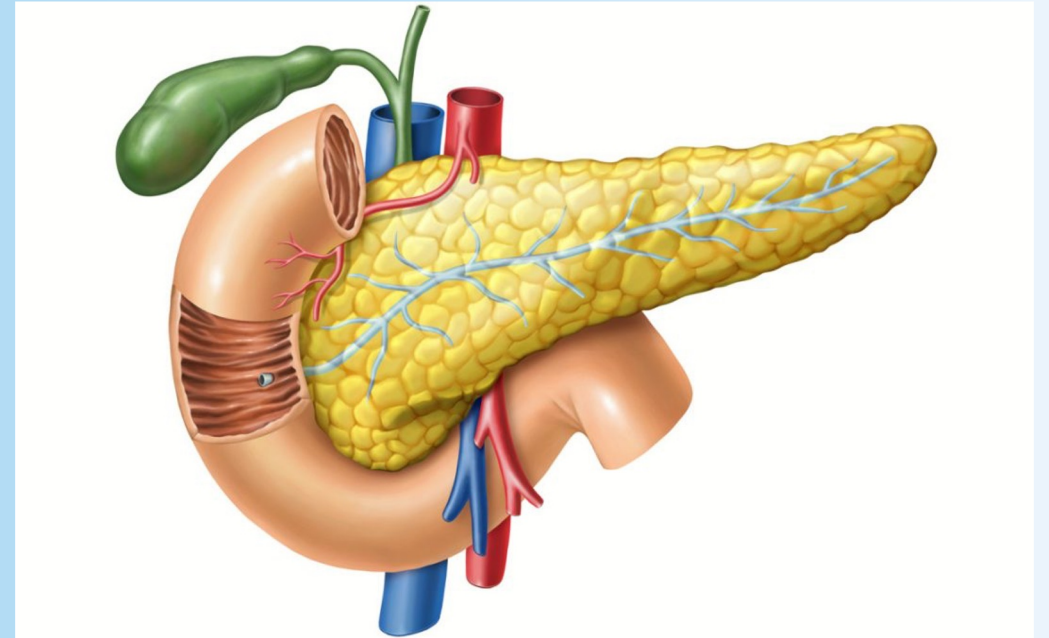
# Pancreas

## Endocrine function

- Alpha cells (glucagon)
- Beta cells (insulin)
- Delta cells (somatostatin)
- PP cells (pancreatic polypeptide)

## Exocrine function

- Production of digestive enzymes
- Amylase, lipase, protease, trypsin





Physiology of the pancreas



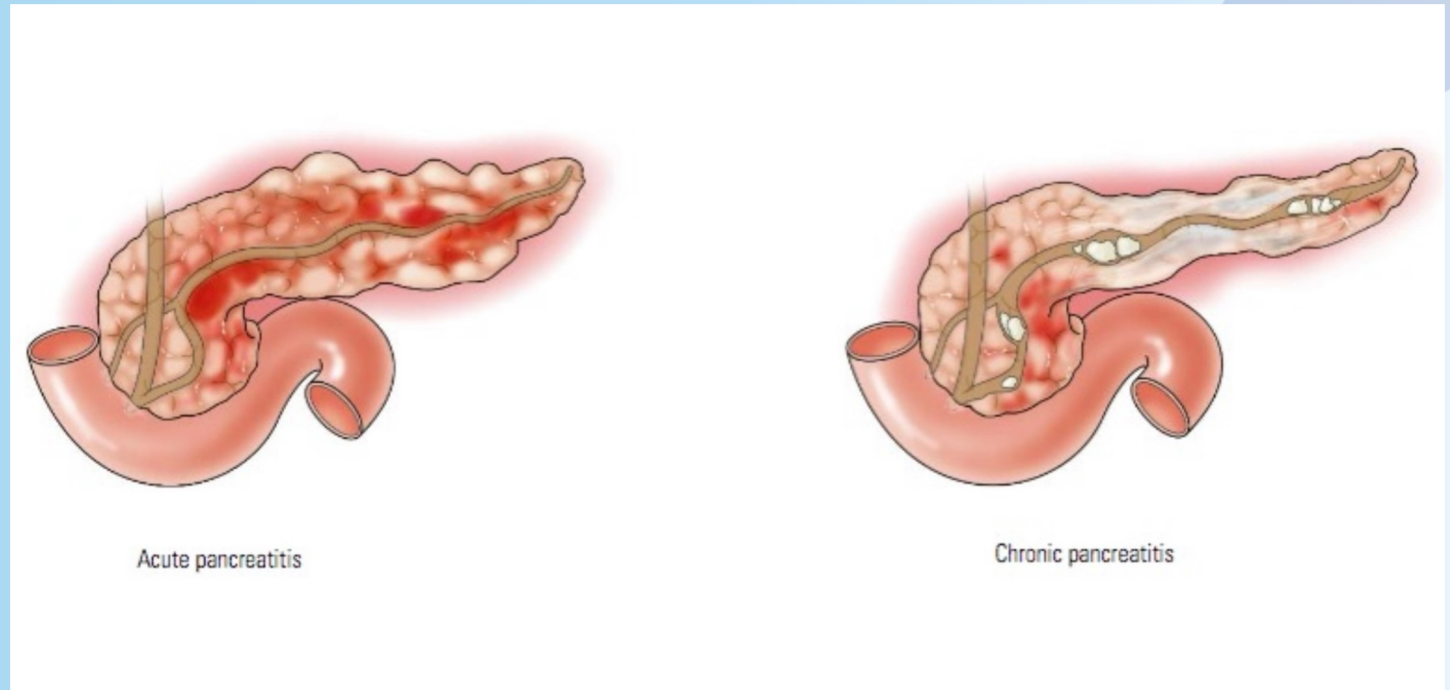
Acute pancreatitis



Chronic pancreatitis

# Pancreatitis

- Inflammation of the pancreas
- Acute inflammation
- Chronic inflammation

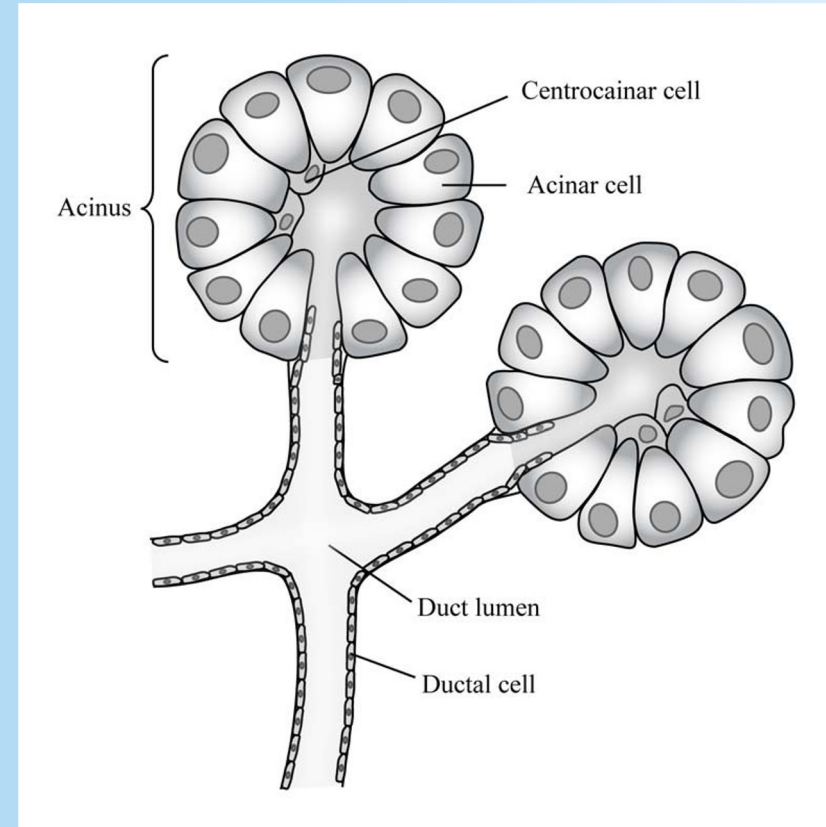


## Acinar cells

- Produce digestive enzymes

## Ductal cells

- Form the epithelial lining of the pancreatic ducts



# Causes of acute pancreatitis

**I** - Idiopathic

**G** - Gallstones

**E** - Ethanol abuse

**T** - Trauma

**S** - Steroids

**M** - Mumps virus

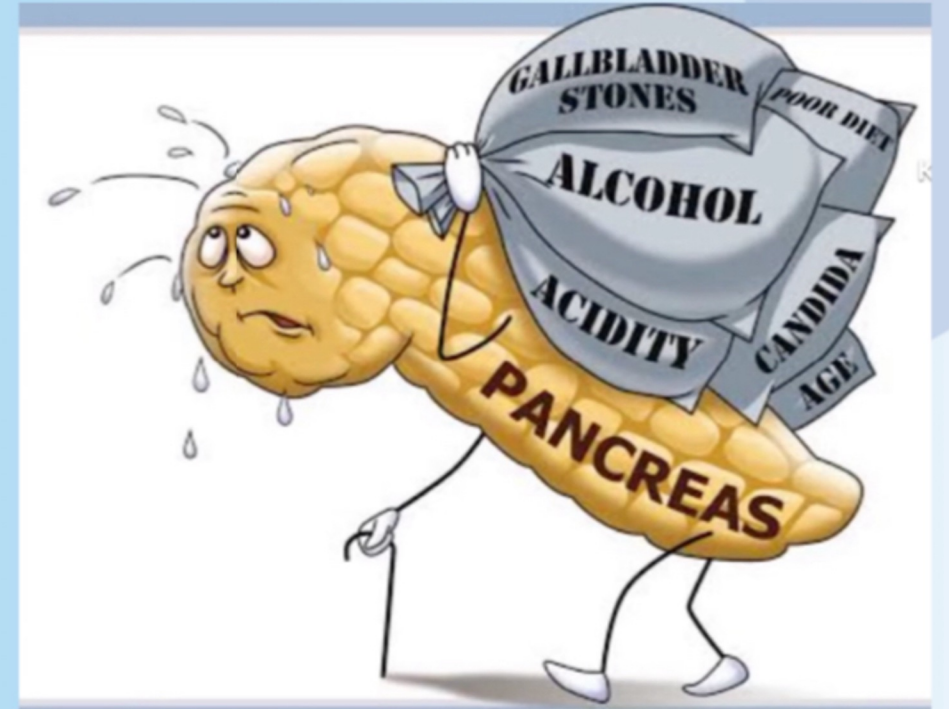
**A** - Autoimmune disorders

**S** - Scorpion stings

**H** - Hypertriglyceridemia and hypercalcemia

**E** - ERCP

**D** - Drugs



# Acinar cell damage



# Acinar cell damage

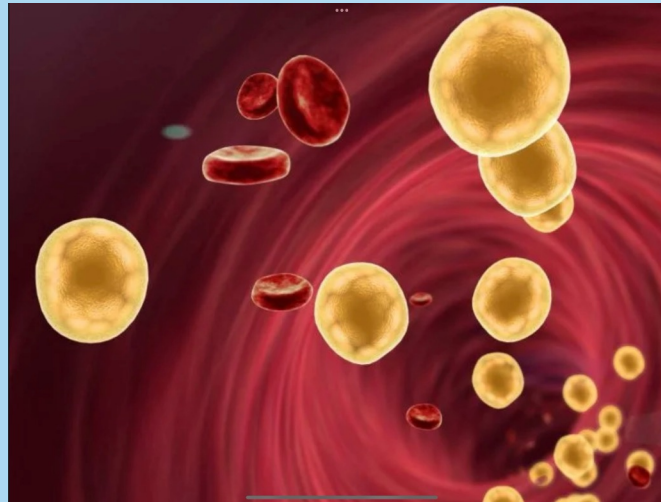
Alcohol <3



# Acinar cell damage

Alcohol <3

Hypertriglyceridemia

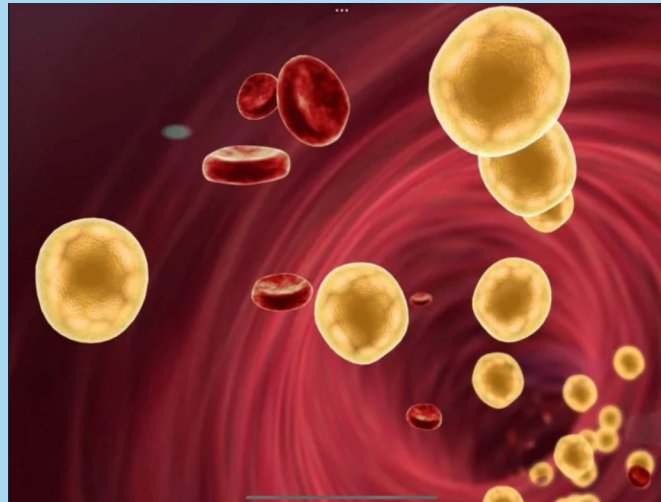


# Acinar cell damage

Alcohol <3



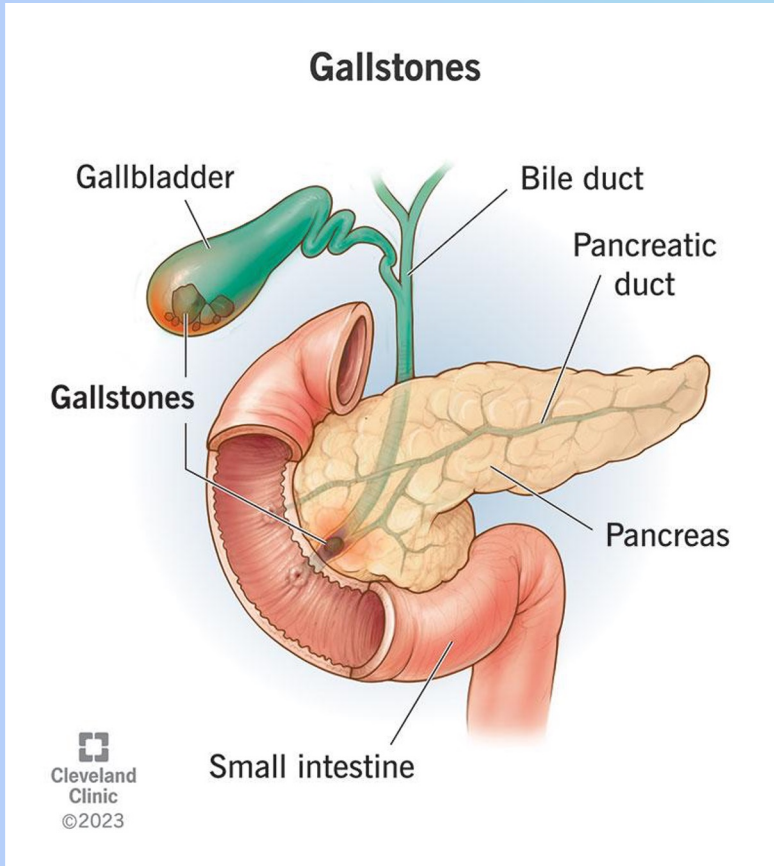
Hypertriglyceridemia



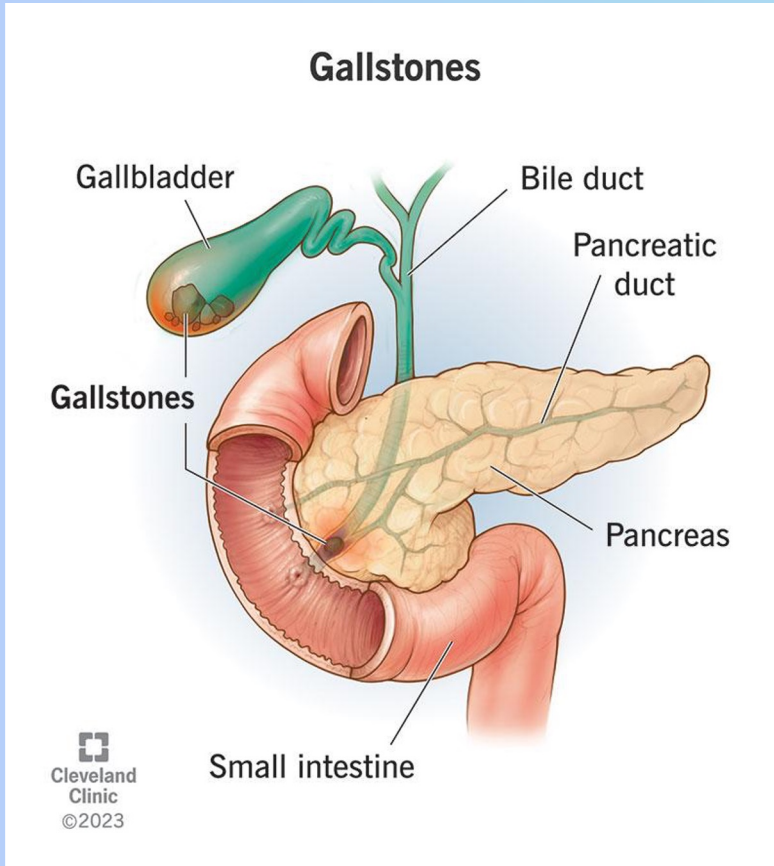
Drugs



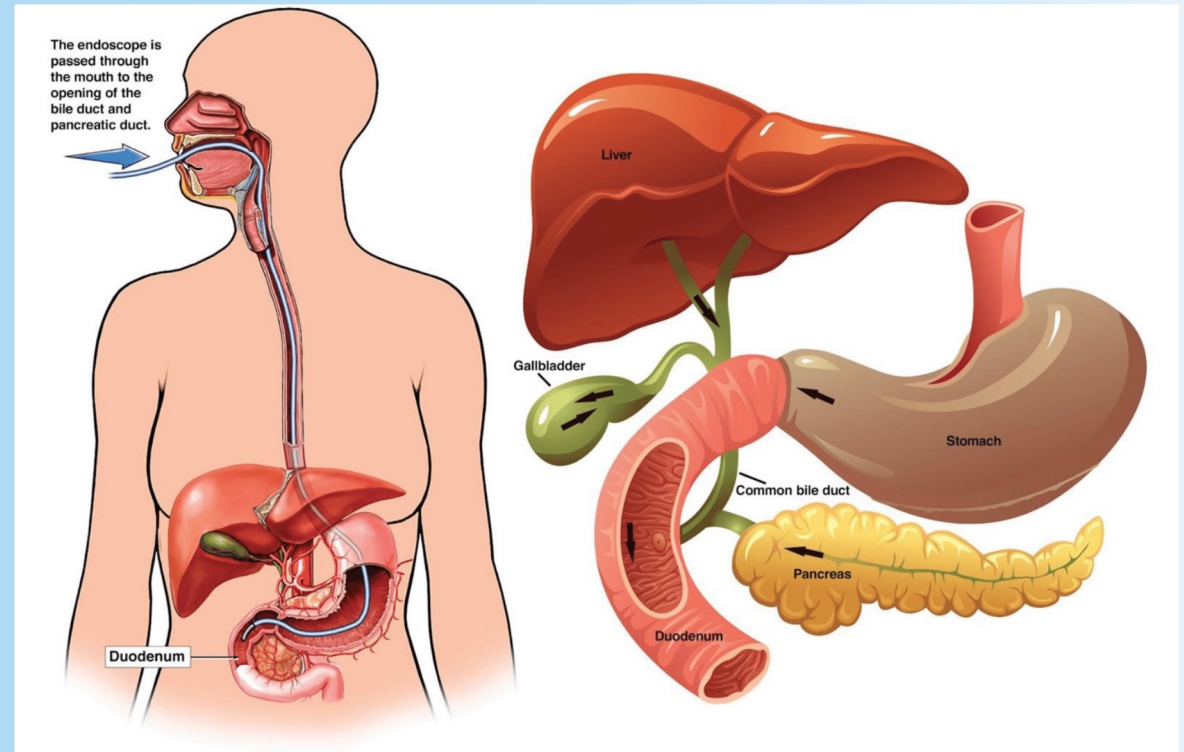
# Ductal cell damage



# Ductal cell damage



## ERCP



# Refresher

1. Inflammation

1. Recruitment of white blood cells

1. Increased vascular permeability

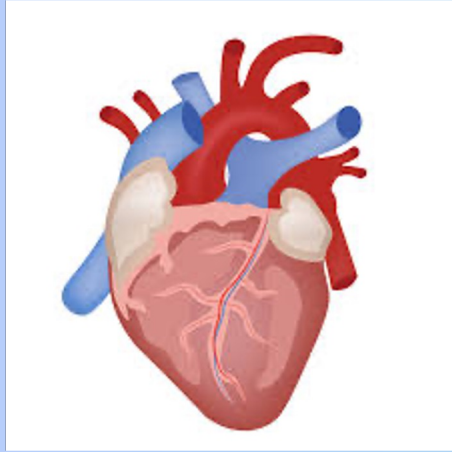
# Fluid spacing

**First spacing:** All fluids are where they should be. There is normal distribution of fluid in the intra- and extracellular fluid.

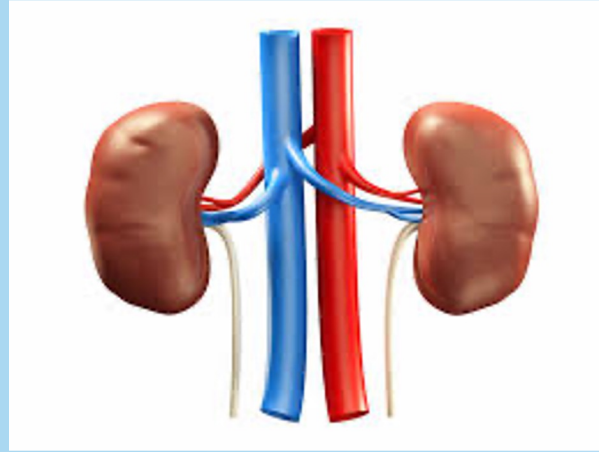
**Second spacing:** Abnormal accumulation of fluid in interstitial spaces, such as edema. This abnormal accumulation can still be easily moved back where it should be

**Third spacing:** Abnormal accumulation of fluid trapped in spaces where it is difficult or impossible to return to where it should be such as ascites or burn related injuries. This requires medical intervention to reverse

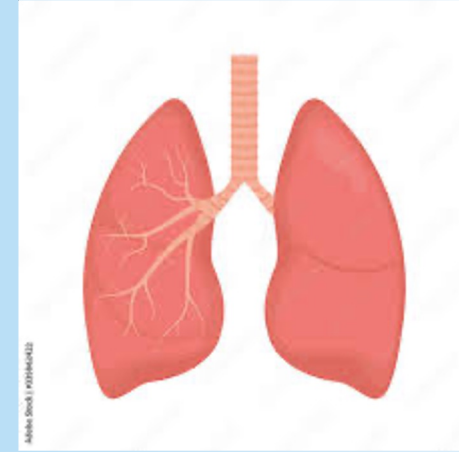
# Systemic inflammatory response syndrome



- Increased heart rate
- Low BP



- Low kidney perfusion
- AKI



- Diffuse alveolar damage
- ARDS



# Acinar cell injury lead to:

## (1) Interstitial inflammation and edema

## (2) Proteolysis

Action of proteases: increased vascular permeability  
Blood vessels leak and rupture → ARDS

## (3) Fat necrosis

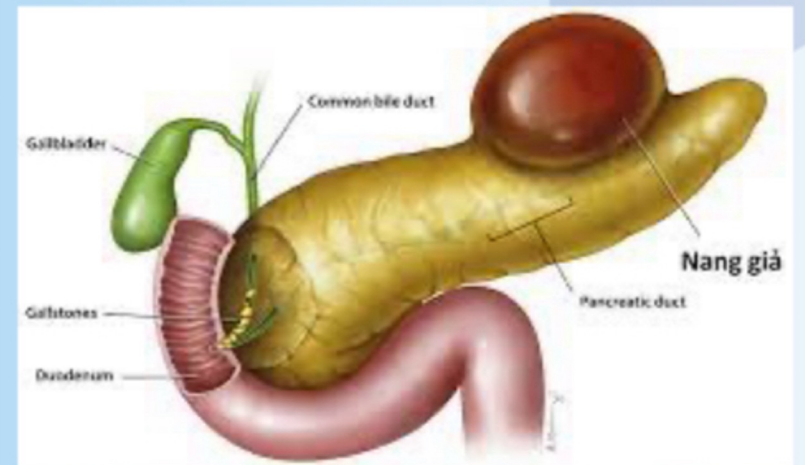
Action of lipase and phospholipase  
Destruction of peripancreatic fat

## (4) Hemorrhage

→ Hypovolemia & septic shock

Action of elastase: destroys elastic tissue of blood vessels

Digestion and bleeding can liquefy tissue: liquefactive hemorrhagic necrosis and pancreatic pseudocyst



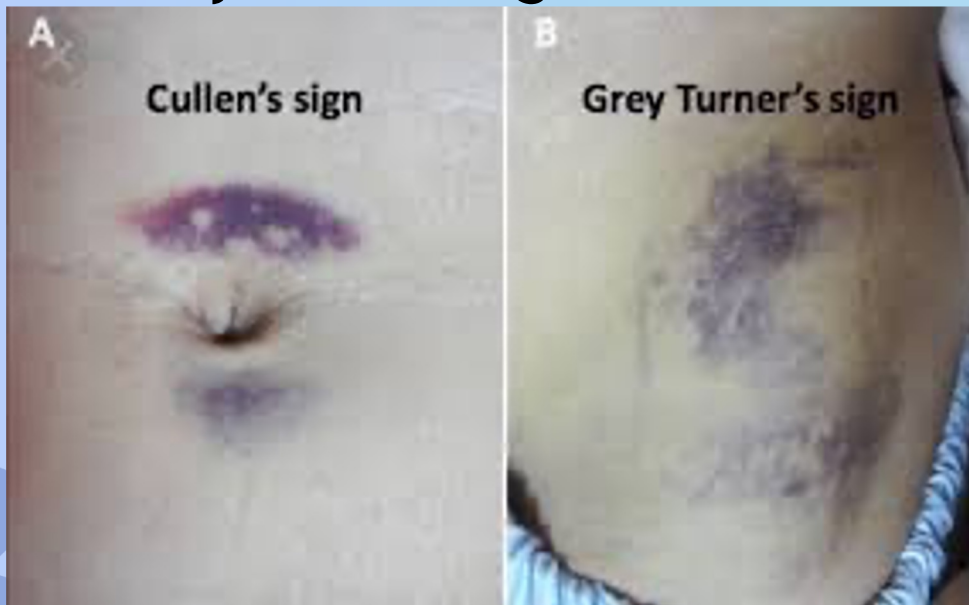
# Diagnostic picture

- Epigastric pain
- Pain radiates to the back
- Abdominal tenderness
- Cullen's sign
- Grey Turner sign

Lab values:	Explanation:
↑ Lipase (3x normal value)	Rise within 8 hours Return to normal within 14 days Autodigestion of pancreas (consequence of acute pancreatitis) results in release of lipase and amylase.
↑ Amylase (3x normal value)	Rise within 12 hours Return to normal within 5 days Autodigestion of pancreas (consequence of acute pancreatitis) results in release of lipase and amylase.
↑ Leukocytes & hematocrit	Increased due to dehydration or hemorrhaging
↑ CRP and LDH	Increased due to inflammation
↑ BUN & Creatinine	Renal insufficiency, pancreatic necrosis and dehydration
↓ Calcium	Decreased due to that fat necrosis consume $\text{Ca}^{2+}$

# Diagnostic picture

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Physiology of the pancreas



Acute pancreatitis



Chronic pancreatitis

# Chronic pancreatitis

(1) Repeated bounces of acute pancreatitis

(2) Persistent inflammation cause changes in structure

Ductal dilation

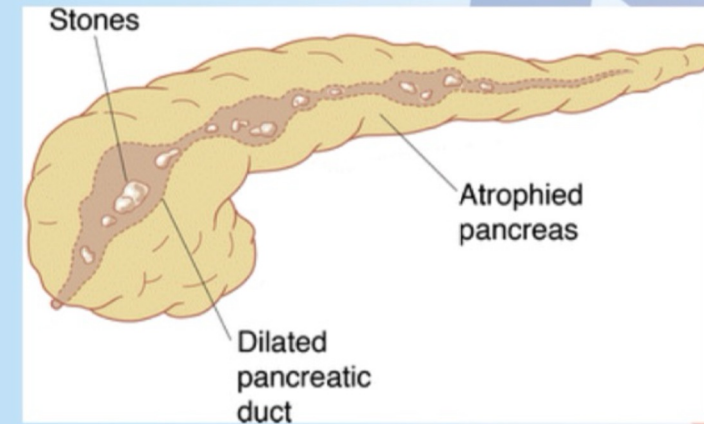
Stellate cells produce fibrotic tissue causing stenosis

Calcium deposition → Plugs

(3) Pancreatic insufficiency

Destruction of pancreatic b-cells → Diabetes mellitus

Acinar cell atrophy → Decreased production of digestive enzymes → ADEK deficiency & Steatorrhea



# Acinar cell damage

Alcohol abuse



## Acinar cell damage

Alcohol abuse



## Ductal cell damage

Cystic fibrosis





**QUESTIONS?**



**Thank you lovelies <3**