

Lecture 4: Acute Pancreatitis

◆ General characteristics & epidemiology:

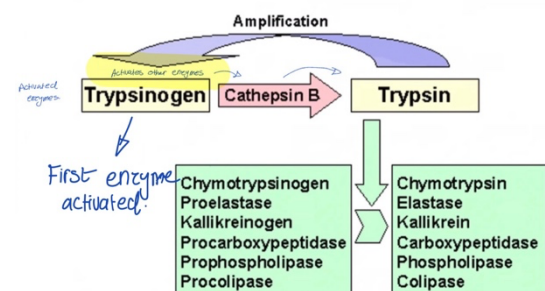
- It's a **reversible inflammation** of the pancreas due to **autodigestion** by its own enzymes
- Appears **suddenly** and lasts for **days**
- 📍 It occurs at **any age**, but **peaks in young men and older women**
- 📊 **3% of abdominal pain cases**
- 📄 ~ **400 patients/million per year**
- (**Biliary & Alcoholic**) causes account for **90% of cases**
- ⚠️ Mortality is **2–7.5%**, especially in:
 1. Age > 70 y
 2. Comorbidity
 3. noting 50% of deaths occur in the **initial week**

🔥 Etiology:

Mnemonic: I GET SMASHED

- **I** = Idiopathic
- **G** = Gallstones
- **E** = Ethanol
- **T** = Trauma
- **S** = Steroids
- **M** = Mumps ("You see swollen face")
- **A** = Autoimmune
- **S** = Scorpion stings / spider bites
- **H** = Hyperlipidemia, Hypercalcemia, Hyperparathyroidism
- **E** = ERCP
- **D** = Drugs → (Diuretics / thiazides / Metronidazole /Reverse transcriptase inhibitors)

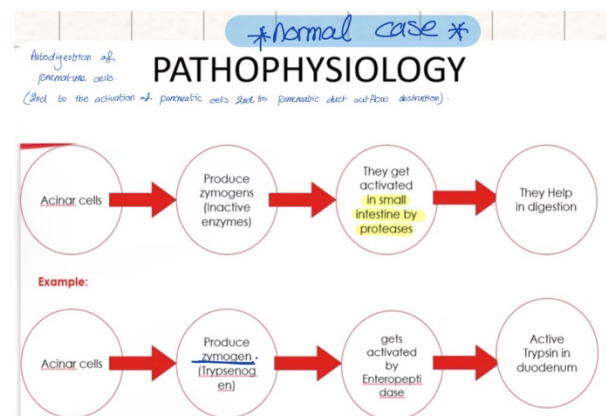
PATHOPHYSIOLOGY

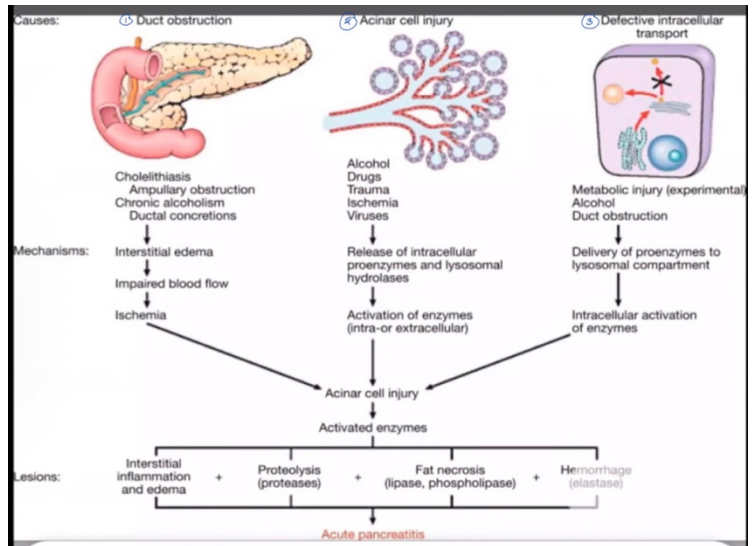


🧬 Pathophysiology:

1. **Intrahepatic activation of pancreatic enzymes** secondary to **pancreatic ductal outflow obstruction**
2. ↑ Enzyme activity
3. **Destruction** of parenchyma
4. **Activation of inflammatory cells** = **Pancreatitis**
 ➡ Activation of Step 4 could also cause:

- **Edema**
- **Hemorrhage**
- Eventually **necrosis**
- Or systemic complications:
 - ARDS
 - Pleural effusion
 - Low-grade fever
 - Tachycardia
 - ↓ BP





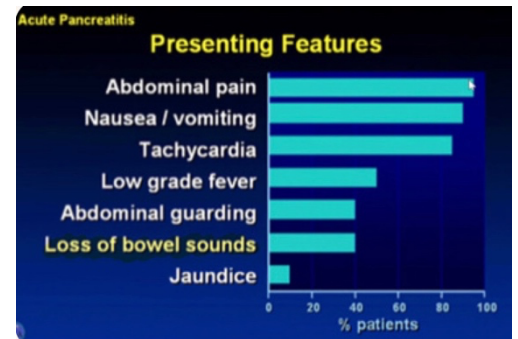
◆ Presentation:

◆ Symptoms:

1. **Abdominal pain:** dull/steady, severe, radiates to the **back**, worse with food and supine
2. **Nausea / vomiting**

◆ Signs:

1. **Low grade fever (76%)**, ↑ WBC
2. **Tachycardia (>65 bpm)**
3. **Hypotension**
4. **Epigastric tenderness**
5. **Signs of hemorrhagic pancreatitis:**
 - **Cullen's sign** (periumbilical bruising)
 - **Grey Turner's sign** (flank ecchymosis)
 - **fox appearance**



◆ Diagnosis:

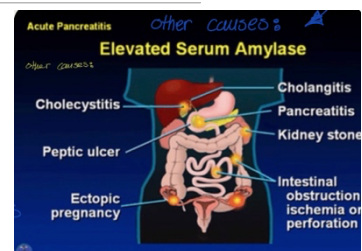
To diagnose → Must fulfill **2 out of 3**:

1. **Abdominal pain**
2. **Raised lipase/amylase** > 3× normal
3. **Characteristic findings on imaging**

Amylase

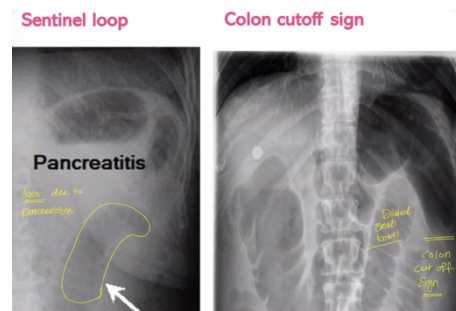
- Easiest to measure and most widely used
- Rises immediately
- Peaks in few hours
- Remains for 3-5 days
- "Three fold rise is diagnostic"
- May be normal in severe attacks
- May be falsely negative in hyperlipidemic patients
- Inverse correlation between severity and serum amylase level
- No need to repeat

Same for lipase but it stays high for 8 days.

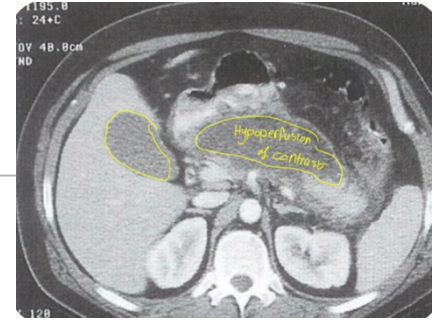


Imaging:

- **Abdominal radiograph** (esp. needed for late presentations)
 - ◆ May show:
 - Sentinel loop sign
 - Air in C loop
 - Colon cutoff sign
 - All **non-specific**
- **Abdominal ultrasound**
 - To identify **gallstones** and **pseudocysts**
- **CT scan** → **Most accurate** for diagnosis and complications
 - Findings:
 - Enlargement



- Irregular enhancement
- Shaggy pancreatic contour
- Thickening of fascial planes
- Fluid collections in intra-/retroperitoneal space



Prognosis:

- You start with:
 - Serum markers
 - CT
 - Systemic complications

However, you can find **nothing** early, so we use **prognostic tools to assess severity**.

Common scoring systems:

1. Ranson's criteria
2. Atlanta criteria
3. Apache II
4. Modified Glasgow
5. CT

Table 32-4
Ranson's Prognostic Signs of Pancreatitis

Criteria for acute pancreatitis not due to gallstones	Criteria for acute gallstone pancreatitis
At admission	At admission
Age > 55 y	Age > 70 y
WBC > 18,000/mm ³	WBC > 18,000/mm ³
Blood glucose > 200 mg/dL	Blood glucose > 220 mg/dL
Serum LDH > 350 IU/L	Serum LDH > 400 IU/L
Serum AST > 250 U/L	Serum AST > 250 U/L
During the initial 48 h	During the initial 48 h
Hematocrit fall > 10 points	Hematocrit fall > 10 points
BUN elevation > 5 mg/dL	BUN elevation > 2 mg/dL
Serum calcium < 8 mg/dL	Serum calcium < 8 mg/dL
Arterial PO ₂ < 60 mm Hg	Arterial PO ₂ < 60 mm Hg
Base deficit > 4 mEq/L	Base deficit > 5 mEq/L
Estimated fluid sequestration > 6 L	Estimated fluid sequestration > 4 L

AST = aspartate transaminase; BUN = blood urea nitrogen; LDH = lactate dehydrogenase; PO₂ = partial pressure of oxygen; WBC = white blood cell count.
SOURCE: Reproduced with permission from Ranson JHC. Etiological and prognostic factors in human acute pancreatitis: A review. *Am J Gastroenterol* 77:633, 1982.

🧠📌 **CT Gold standard** for detecting and assess severity, so we perform it **regardless of Ranson's/APACHE scores**

Balthazar CT Severity Index (CTSI):

- Considers:
 - Degree of necrosis
 - CT grade
- Grades correlate with **mortality** and **complications**? (its mild if → 1- no systemic signs findings (balthazar). 4- CDR<150)

CTSI	Mortality	Complication
0-3	3%	8%
4-6	6%	35%
7-10	17%	92%

PROGNOSIS (CT)

- Grade of necrosis and the points assigned per grade are as follows:
 - None 0 points
 - Grade 0.33 2 points
 - Grade 0.5 4 points
 - Grade > 0.5 6 points

3- CT

PROGNOSIS (CT)

Balthazar grading

• Grade A - Normal-appearing pancreas	0
• Grade B - Enlargement of the pancreas	1
• Grade C - Pancreatic gland abnormalities with peripancreatic fat infiltration	2
• Grade D - A single fluid collection	3
• Grade E - Two or more fluid collections	4

Management:

✓ Mild:

1. NPO
2. IV fluids
3. Return to food: When there is:
 - Absence of pain
 - Hungry
 - No tenderness

Atlanta Revision (2013)	
Mild acute pancreatitis	
Absence of organ failure	GI bleeding (>500cc/24hr)
Absence of local complications	Shock - SBP ≤ 90 mmHg
Moderately severe acute pancreatitis	
1. Local complications AND/OR	PaO ₂ ≤ 60%
2. Transient organ failure (<48h)	Creatinine ≥ 2mg/dl
Severe acute pancreatitis	
Persistent organ failure >48h*	

These 2 steps takes about 3-7d then slow **sips of water**, then **low-fat, low-protein** meals

4. NG tube
5. H2 blockers
6. Antisecretory agents (e.g., Somatostatin)
7. Antibiotics **not used unless there's necrosis**

● Severe:

1. No systemic infections ► Supportive and prophylactic ab therapy
 2. Systemic infections:
 - CT-guided aspiration
 - Gram stain → If positive → Antibiotics
 3. Multisystem infections:
 - Surgical debridement
 4. **Nutritional support:**
 - NPO but if it stays for >7 days → Use ✓ TPN (gastric mucosal atrophy, bacterial translocation)
 - ✓ Jejunol feeding is superior to TPN → induce pancreatic secretions
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✓ Biliary Pancreatitis:

- Bilirubin dropping → lap cholecystectomy and I/O cholangiogram (same admission)
 - Bilirubin persist → MRCP to confirm presense of stone thin ERCP / lap. cholecystectomy
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👉 Pancreatic Pseudocyst:

- Encapsulated localized collection of pancreatic enzyme , inf. Fluid and necrotic debris on pancreas or in part or the whole of the lesser sac
 - They are distinguished from other types of pancreatic cysts by their lack of an epithelial lining
 - CT scan is the investigation of choice in pancreatic pseudocysts. It has a sensitivity of 90-100%
 - All cysts do not require treatment. In many cases the pseudocysts may improve and go away on their own.
 - In a patient with a small (less than 5cm) cyst that is not causing any symptoms, careful observation of the cyst with periodic CT scans is indicated.
 - (if larger than 5cm) → 1- Percutaneous cath drainage 2-Internal drainage → surgical / endoscopic
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