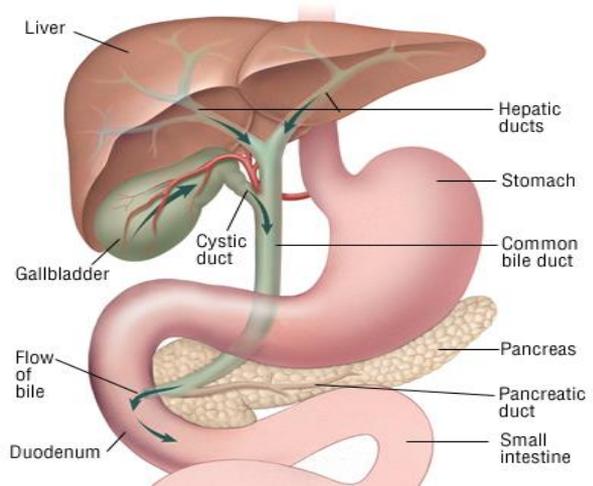
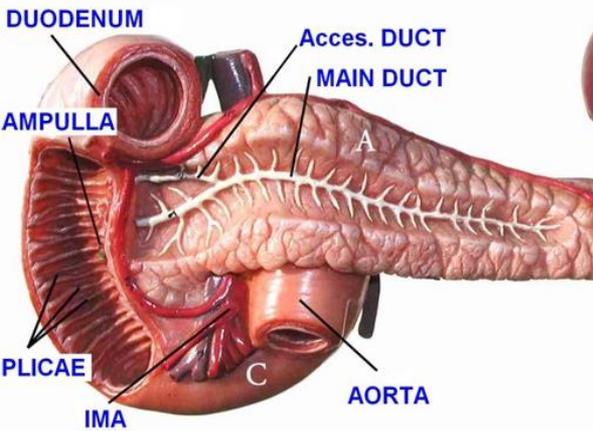


Patient Information Leaflet on “Pancreatitis – causes and treatment”

Introduction – “The Pancreas”



- ❖ The pancreas is a both endocrine and exocrine gland that lies in the upper abdomen and lies behind the stomach and guts (intestines).
- ❖ It makes a fluid that contains chemicals (enzymes) which are needed to digest food. The enzymes are made in the pancreatic cells and are passed into tiny tubes (ducts). These ducts join together like branches of a tree to form the main pancreatic duct.
- ❖ This drains the enzyme-rich fluid into the part of the gut just after the stomach (called the duodenum). The enzymes are in an inactive form in the pancreas (otherwise they would digest the pancreas).
- ❖ They are 'activated' in the duodenum in presence of bile from the liver to digest food.
- ❖ Groups of special cells called 'islets of Langerhans' are scattered throughout the pancreas.
- ❖ These cells make the hormones insulin and glucagon. The hormones are passed (secreted) directly into the bloodstream to control the blood sugar level.

What is pancreatitis?

- Pancreatitis means inflammation of the pancreas. There are two types:
- **Acute pancreatitis** - the inflammation develops quickly, over a few days or so. It often goes away completely and leaves no permanent damage. Sometimes it is serious.
- **Chronic pancreatitis** - the inflammation is persistent. The inflammation tends to be less intense than acute pancreatitis but as it is ongoing it can cause scarring and damage. See separate leaflet "[Chronic Pancreatitis](#)" for more details.
- Acute pancreatitis has become more common in recent years. One of the reasons for this is - increase in alcohol consumption recently - in particular, binge drinking.

Acute Pancreatitis - *Pathophysiology*

- Autodigestion (**Trypsinogen- (a proteolytic enzyme)** activated to trypsin with in the pancreas causing autodigestion of pancreas)



Acute Inflammation of Pancreas



Necrosis of Pancreas



Digestion of vascular walls



Thrombus and Hemorrhage

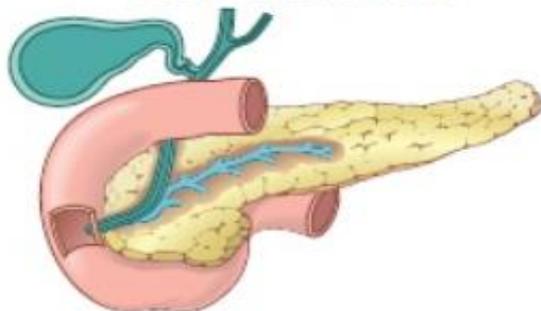


Death

Pathogenesis of acute pancreatitis(summary)

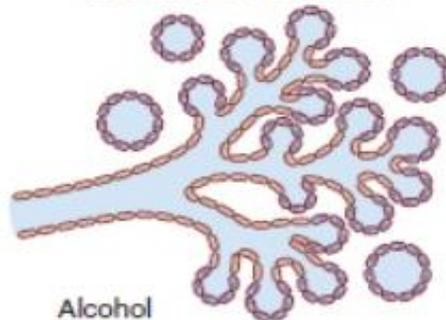
CAUSES:

DUCT OBSTRUCTION



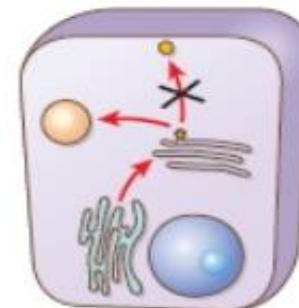
Cholelithiasis
Ampullary obstruction
Chronic alcoholism
Ductal concretions

ACINAR CELL INJURY



Alcohol
Drugs
Trauma
Ischemia
Viruses

DEFECTIVE INTRACELLULAR TRANSPORT



Metabolic injury (experimental)
Alcohol
Duct obstruction

MECHANISMS:

Interstitial edema

Impaired blood flow

Ischemia

Release of intracellular
proenzymes and lysosomal
hydrolases

Activation of enzymes
(intracellular or extracellular)

Delivery of proenzymes to
lysosomal compartment

Intracellular activation
of enzymes

Acinar cell injury

ACTIVATED ENZYMES

LESIONS:

Interstitial
inflammation
and edema

+

Proteolysis
(proteases)

+

Fat necrosis
(lipase, phospholipase)

+

Hemorrhage
(elastase)

ACUTE PANCREATITIS



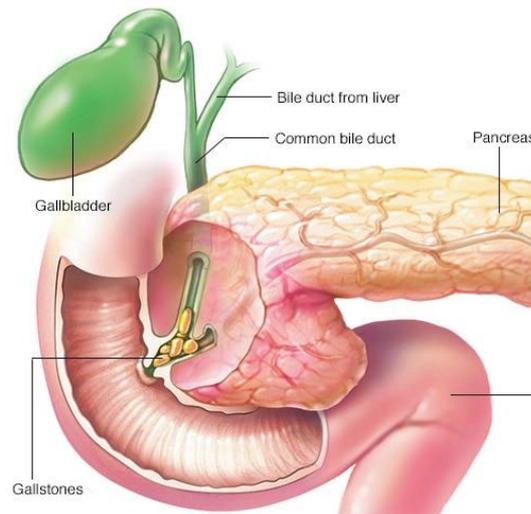
What are the causes of Pancreatitis ??



- **Alcohol** – one of the common cause. Actually mechanism - not clear. Symptoms typically begin about 6-12 hours after a heavy drinking session. In some people each time they drink – develop a serious attack (even after a small amount of alcohol, i.e. - 'sensitivity' of pancreas).
- **Gallstones** - the most common cause, in female in India. In some people a gallstone becomes stuck in the lower end of bile duct or where the bile duct and pancreatic duct open into the duodenum. This can affect the chemicals (enzymes) in the pancreatic duct (or even block them completely) and trigger a pancreatitis.
- Gallstones or alcohol cause more than 70-80% of all cases .

Other causes are rare.

- **Post-ERCP pancreatitis**
- **High blood fat levels** - hypertriglyceridaemia. Cause 1-4% of all cases (more during pregnancy).
- High blood calcium levels (hyperparathyroidism/ hyperthyroidism etc).
- Abnormal structure (pancreas divisum, annular pancreas etc).
- Viral infections (for example, the mumps virus, HIV).
- Injury or surgery around the pancreas.
- Drugs / Infections
- Hereditary - inherited from a parent.
- **Autoimmune** - example, Sjögren's syndrome, primary biliary cirrhosis.
- **Unknown** – approx. 10-20% cases



Symptoms & Signs of acute pancreatitis

- ❖ Upper abdominal pain
 - ❖ Just below the ribs, is the usual main symptom.
 - ❖ It usually builds up quickly (over a few hours) and may last for several days.
 - ❖ The pain can become severe and is typically felt spreading through to the back.
 - ❖ The pain is usually sudden and intense
 - ❖ Occasionally it may begin as a mild pain that is aggravated by eating and slowly grows worse.
- ❖ Vomiting, a high temperature (fever) and generally feeling very unwell – common (typically following a binge drinking) .

On Examination :

- ❖ Abdomen - may become swollen.
- ❖ If the pancreatitis becomes severe and other organs become involved (for example, your heart, lungs or kidneys) then various other symptoms may develop.
- ❖ You may become lacking in fluid in the body (dehydrated) and have low blood pressure.
- ❖ Acute pancreatitis can cause you to be very poorly and can even be life-threatening.

What happens if acute pancreatitis is suspected?

- ❖ Severe Upper abdominal pain, radiating to back, feeling better on bending forward. Vomiting (typically following a binge drinking) & feel generally unwell.
- ❖ You will need to be admitted to hospital if your doctor suspects that you have acute pancreatitis.
- ❖ Blood tests – Serum amylase and/or lipase (enzymes made by the pancreas), a high blood level of these enzymes strongly suggests - pancreatitis is the cause of your symptoms. Other tests to know your general well being and any evidence of organ system damage.
- ❖ An ultrasound scan – (to look for a gallstone if this is the suspected underlying cause)
- ❖ X-ray of Abdomen in erect posture (to exclude other causes).
- ❖ Severity : CECT scan of abdomen and pelvis.
- ❖ MRCP / ERCP
- ❖ Triage : Admission to ICU / Critical care unit / ward.

Classification of acute pancreatitis – Revised ATLANTA criteria 2012

Mild	<ul style="list-style-type: none">• No organ failure• No local complications
Moderate	<ul style="list-style-type: none">• Transient organ failure <48hrs• Local complications +/-
Severe	<ul style="list-style-type: none">• Persistent organ failure >48hrs

* **Local complications** : acute peripancreatic fluid collection, pancreatic pseudo cyst, acute necrotic collection, pleural effusion

* **Organ failure** : failure of 3 main organs, respiratory, cardiac, renal and other organ systems (hepatic, hematological, Neurological)

What is mechanism of acute pancreatitis?

The digestive chemicals (enzymes) that are made in the pancreas become activated and start to 'digest' parts of the pancreas. (They are normally only activated after they reach the duodenum). This leads to a range of chemical reactions that cause inflammation in the pancreas.



Mild

In most cases (70-80%), the inflammation is mild and settles within a week or so. Symptoms may be bad for a few days but then settle and the pancreas fully recovers.



Severe

In some cases (20-30%) the inflammation quickly becomes severe. Parts of the pancreas and surrounding tissues may die (necrose). Pancreatic enzymes and chemicals may get into the bloodstream and cause inflammation and damage to other organs in the body. This can lead to shock, respiratory failure, kidney failure and other complications. This is a very serious situation which can be fatal.

SEVERITY INDEX IN ACUTE PANCREATITIS



Grade of Acute pancreatitis		Points
A	NORMAL PANCREAS	0
B	PANCREATIC ENLARGMENT ALONE FOCAL OR DIFFUSE WITH CONTOUR IRREGULARITIES AND INHOMOGENOUS ATTENUATION	1
C	B+PERIPANCREATIC INFLAMMATION	2
D	C+ONE PERIPANCREATIC FLUID COLLECTION	3
E	D+TWO OR MORE PERIPANCREATIC OR RETROPERITONEAL FLUID COLLECTION OR GAS COLLECTION	4
DEGREE OF PANCREATIC NECROSIS		
1	NO – NECROSIS	0
2	NECROSIS OF <33% PANCREAS	2
3	NECROSIS OF 33%-50% OF PANCREAS	4
4	NECROSIS OF > 50% OF PANCREAS	6
CT SEVERITY INDEX (CT SI)BALTHAZAR SCORE+NECROSIS SCORE		
CT GRADE + NECROSIS GRADE		
(0 - 4) + (0 - 6) → (0 - 10)		

Treatment options in acute Pancreatitis

- Treatment for acute pancreatitis depends on the severity of the condition.
- The treatment plan - often involves a team of specialists including gastroenterologists, surgeons, and radiologists.
- Mild Acute pancreatitis (needs hospitalization) (70-80%)
 - administration of IV fluids to help restore blood volume.
 - nasogastric tube – Decompression / Enteral feeding
 - Antibiotics - if infection occurs
 - pain medications are often used to provide relief.
 - Urinary catheter - to drain urine - monitor accurate amount of urine
- In this case the outlook is very good and full recovery is usual.

Treatment options in acute Pancreatitis

- Severe Acute pancreatitis (20-30%)
- Needs close monitoring in ICU
- Daily evaluation of severity
- To look for evidence of organ failure(CVS, Respiratory, Renal failure)
- Despite ICU care / treatment, up to a quarter of people will die.
- Surgery is sometimes needed when complications
 - infection,
 - cysts, or
 - bleeding occur.

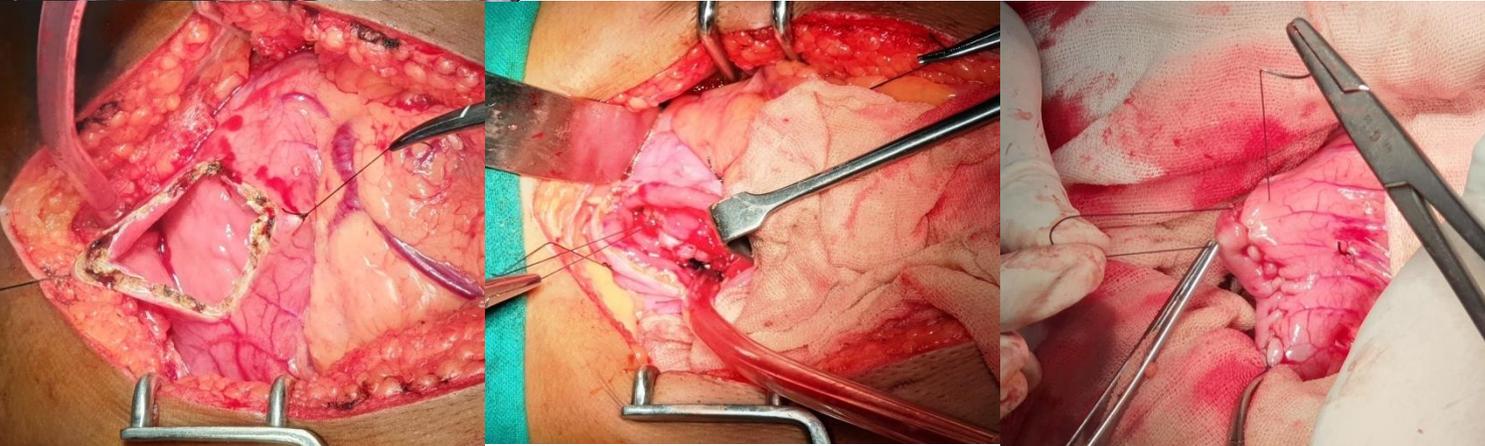
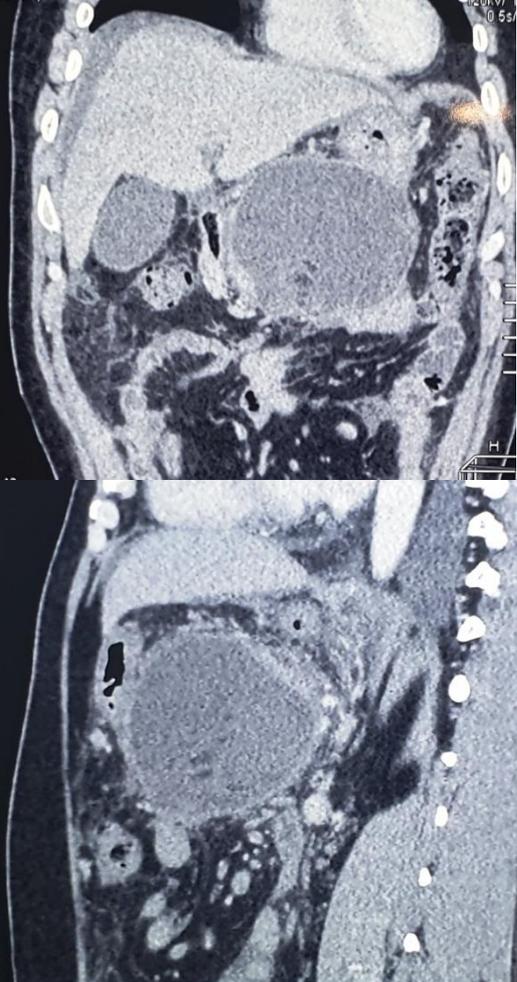
Infected peri-pancreatic fluid collection(PFC) / Pancreatic Infected Necrosis / abscess

- ❖ 5-15% of all pancreatitis develops – PFC/IPN
- ❖ contain pancreatic enzymes, blood & necrotic tissue.
- ❖ Conservative Rx with enteral nutrition, Wait for initial 2 -4 weeks → Failure , then Surgery
- ❖ Drainage –
 - ❖ Radiological : CECT scan / USG guided drainage
 - ❖ Endoscopic (EUS guided Transmural drainage)
 - ❖ Surgical – Necrosectomy + Irrigation & Drainage



Pseudocyst of pancreas

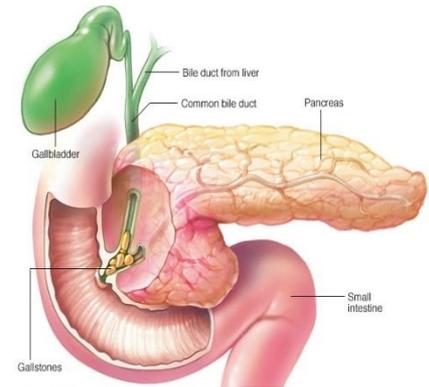
- ❖ Fluid filled sac around pancreas containing pancreatic enzymes, blood and necrotic tissue.
- ❖ Sometimes communicate with pancreatic duct (MRCP – extent, location, types)
- ❖ Surgery - Wait for initial 6weeks / > 6cm size
- ❖ Drainage –
 - ❖ Endoscopic (EUS guided Transmural drainage)
 - ❖ Surgical – Cystogastrostomy/ cusytojejunostomy
 - ❖ Laparoscopic / radiological



What happens after Acute pancreatitis ?

Gall stone pancreatitis

- ❖ Initial – ERCP + Biliary drainage if E/O - cholangitis
- ❖ Lap Cholecystectomy in Mild to moderate cases
- ❖ Severe GSP : Interval LC after 3 to 4weeks



After successful treatment

- Try and determine the cause of the attack and try to prevent recurrence.
- Patients usually recover fully from acute pancreatitis and do not experience recurrence if the cause is removed.
 - **Alcohol** - eliminated or greatly reduced, even if it is not the determined cause.
 - **Smoking** - should be stopped (stresses the body's defense against inflammation)
 - **Specific foods** - trial and error approach is usually indicated.
- Long term –
 - Recurrent AP → Chronic Pancreatitis,
 - Complications – Steatorrhoea / Diabetes mellitus

For details log on to https://www.youtube.com/watch?v=dUZy_Cq3Cyo&feature=youtu.be