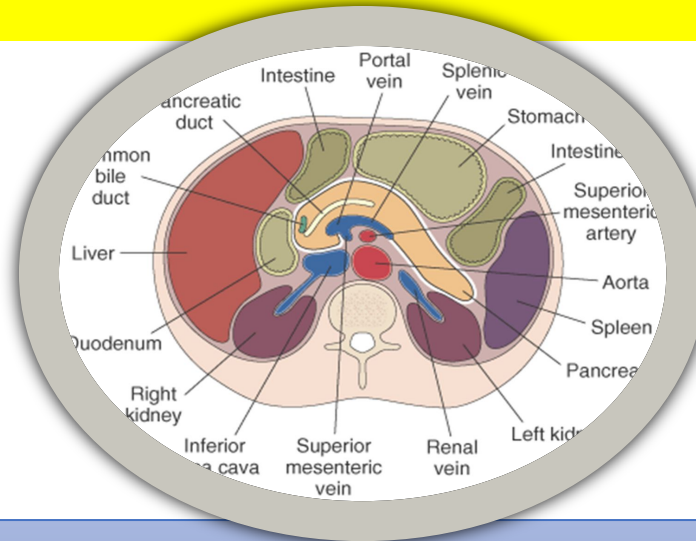


# ELRAZI UNIVERSITY FACULTY OF MEDICINE



## PATHOLOGY OF THE EXOCRINE PANCREAS

**GAMAL ELIMAIRI**



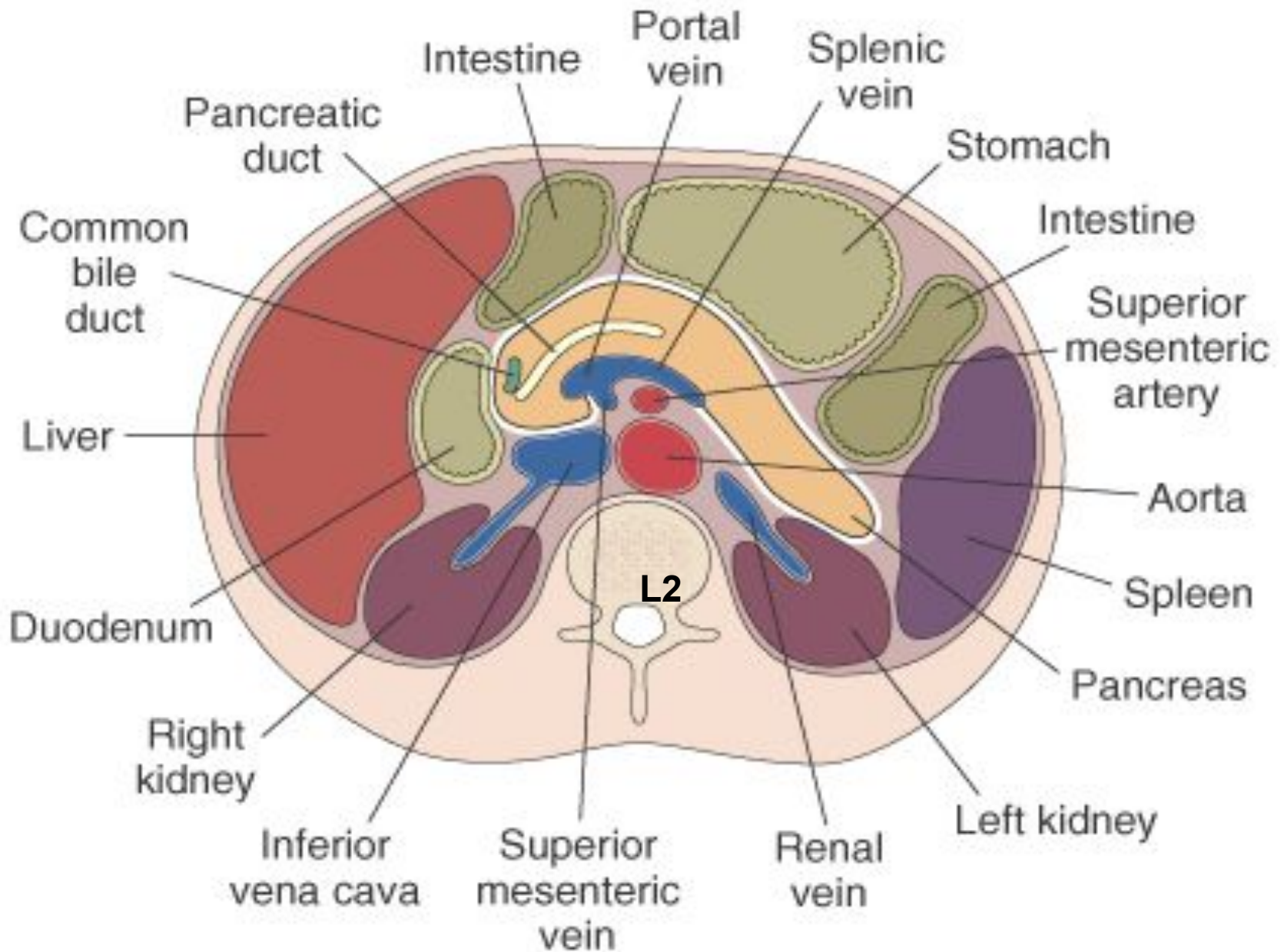
# EXOCRINE PANCREAS

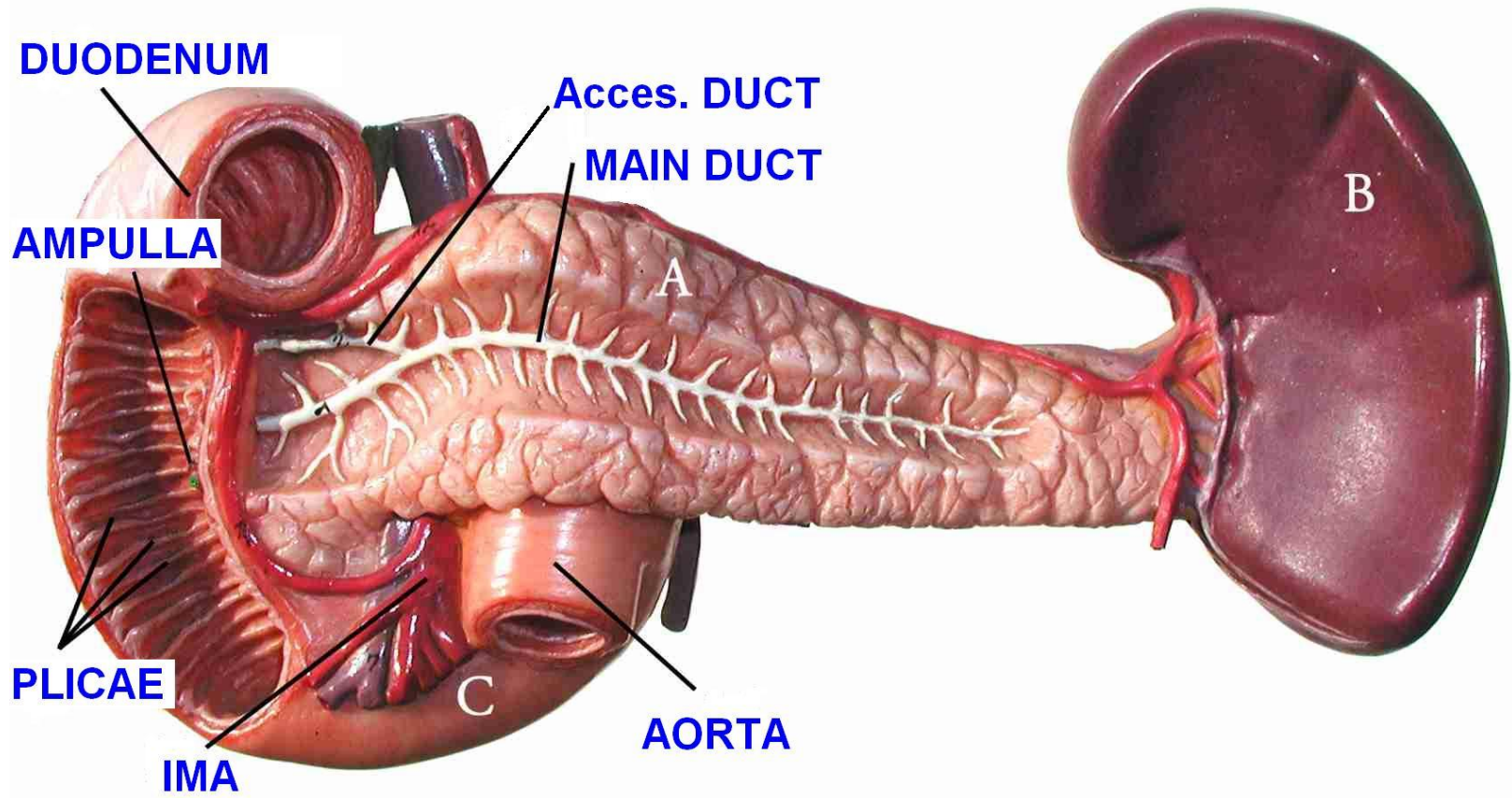


# OBJECTIVES

- Understand the aetiology
- Risk factors,
- Pathogenesis,
- Morphology,
- Clinical features and
- Outcome of pancreatic inflammations and neoplasms



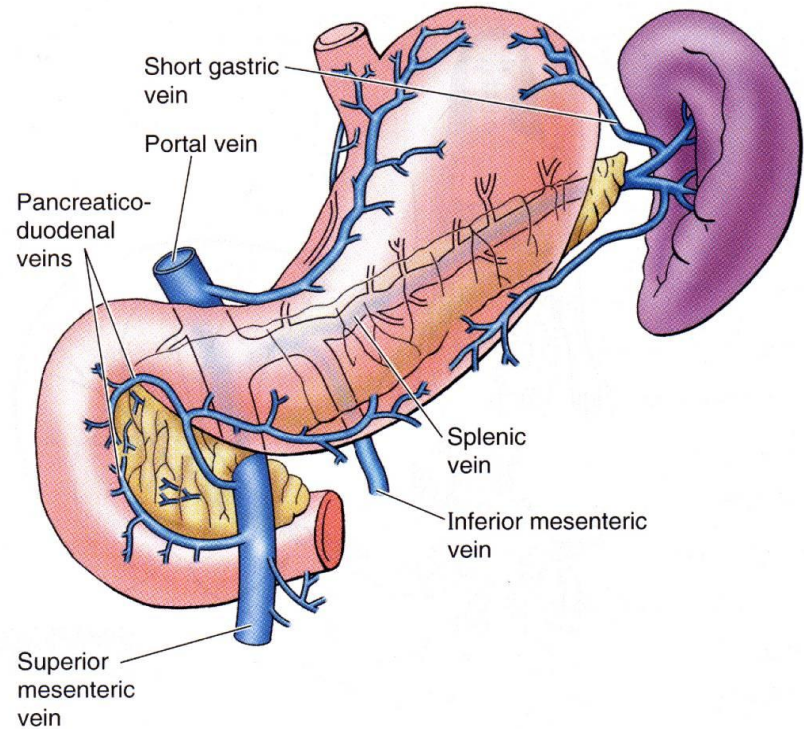
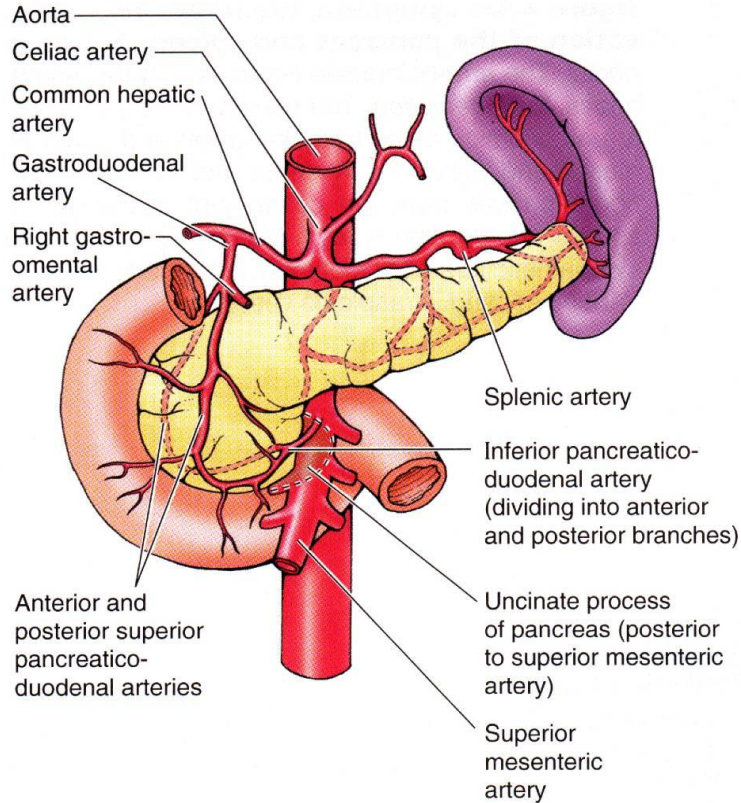




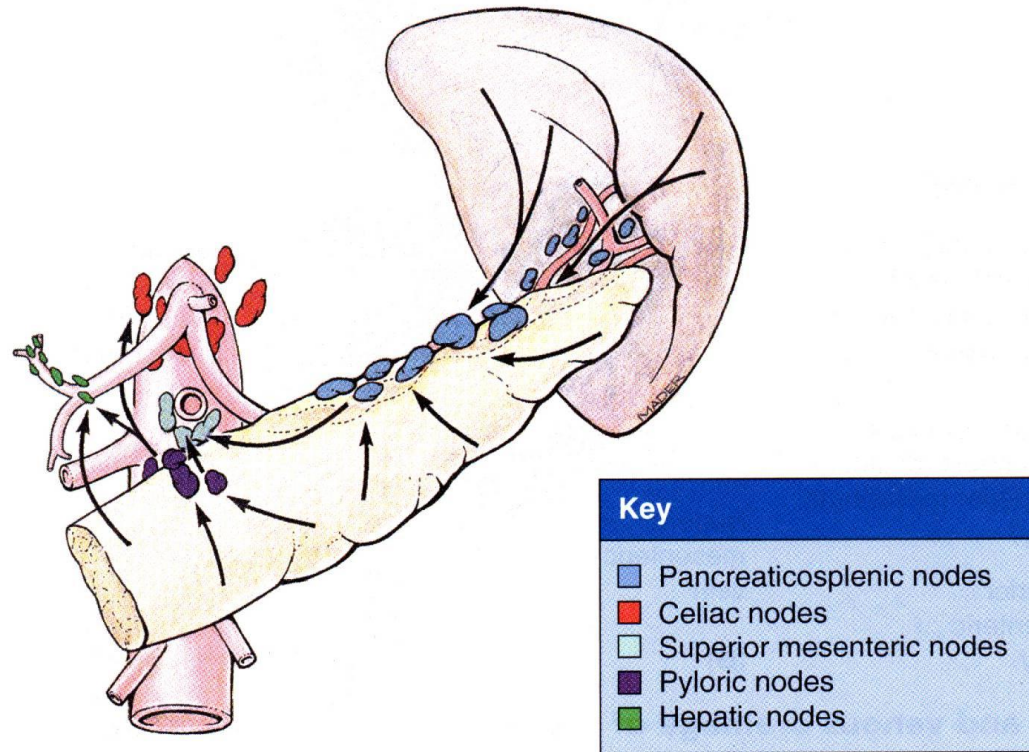
# PANCREAS



# Arterial supply and venous drainage of the pancreas and spleen



# Lymphatic drainage of the distal pancreas and spleen

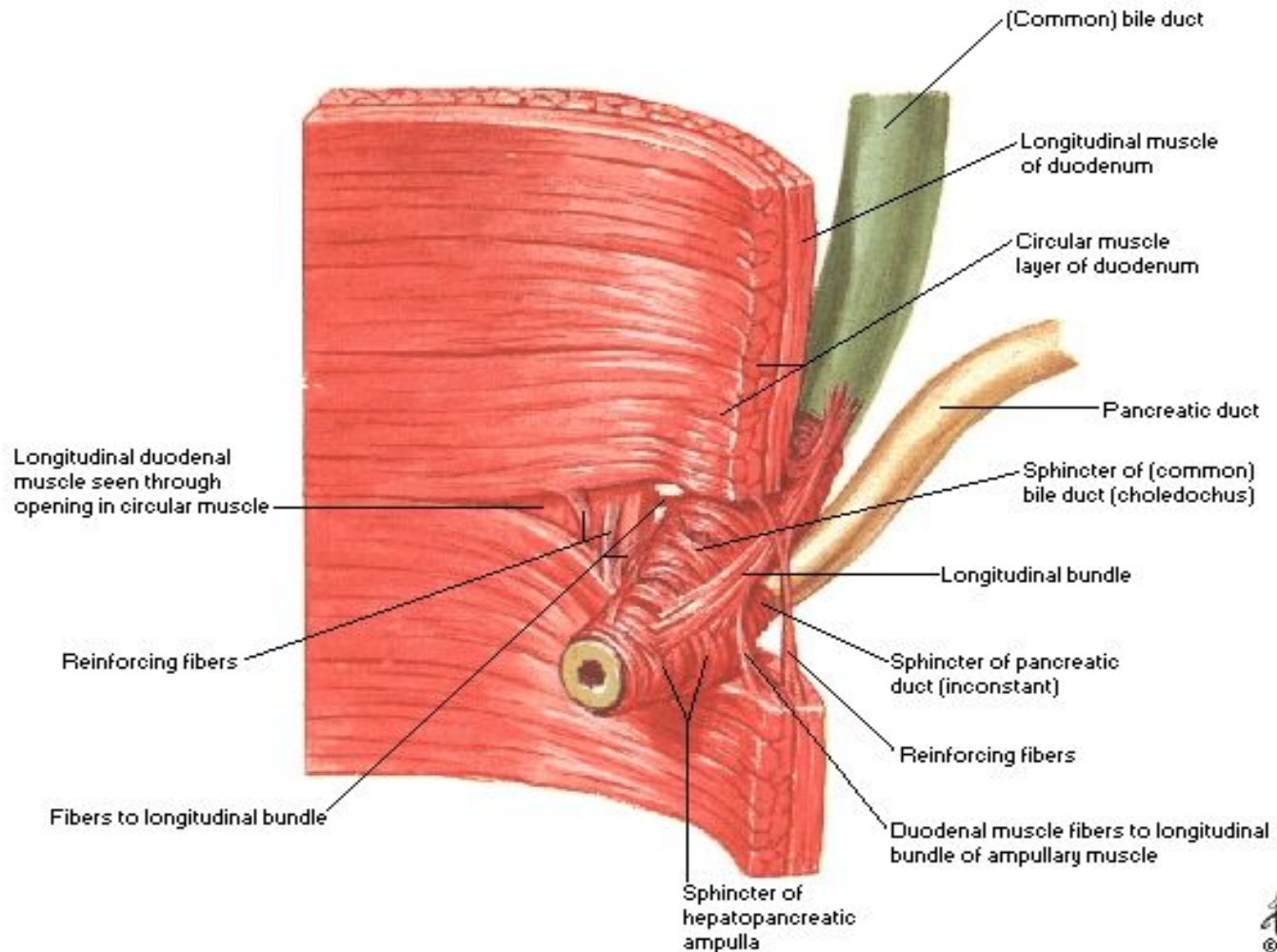


“Peri-”pancreatic lymph nodes, several groups.



# Junction of Bile Duct and Duodenum

## Dissection

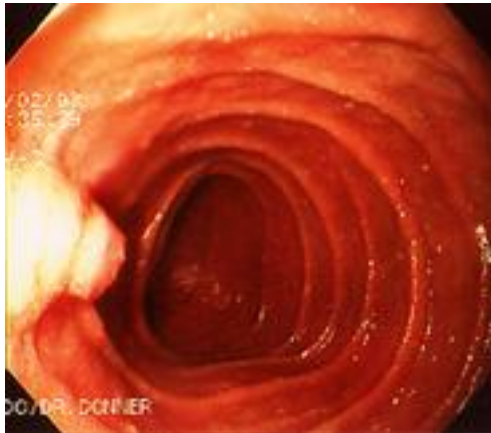


*F. Netter*  
©Novartis





# Hepaticopancreatic ampulla (Ampulla of Vater)



# Pancreatic Enzymes

- **Amylase**
- **Lipase**
- **DNA-ase**
- **RNA-ase**
- **Zymogens: Trypsinogen  
Chymotrypsinogen  
Procarboxypeptidase A, B**



# PANCREAS DISEASES

- Congenital
- Inflammatory
  - Acute
  - Chronic
- Cysts
- Neoplasms



# Congenital

- Agenesis (very rare)
- Annular Pancreas (pancreas encircles duodenum) (rare)
- Pancreas Divisum (failure of 2 ducts to fuse) (common)
- Ectopic Pancreatic tissue (very common)
- Cysts



# PANCREATITIS

- ACUTE (VERY SERIOUS)
- CHRONIC (Calcifications, Pseudocyst)

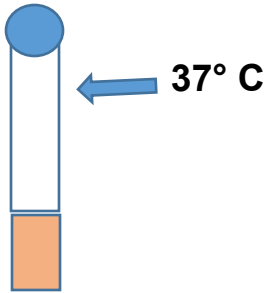


# ACUTE PANCREATITIS

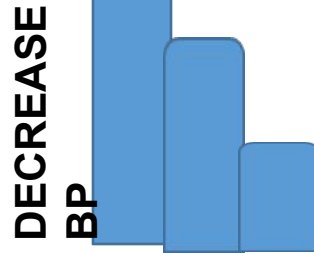
- **Idiopathic:**
- **Gallstones** (45%)
- **Ethanol** (35%)
- **Tumours:** pancreas, ampulla,
- **Scorpion stings**
- **Microbiological** □.bacterial: □.viral: (mumps, varicella) □.parasites:  
**Autoimmune:** SLE, polyarteritis nodosa (PAN), Crohn's
- **Surgery/trauma**
- **abdomen, penetrating peptic ulcer**
- **Hyperlipidemia** (TG >11.3 mmol/L; >1000 mg/dL),  
Hyperparathyroidism **Hypercalcemia, Hypothermia**
- **Emboli or ischemia**
- **Drugs/toxins**, estrogens, methyldopa, H2-blockers



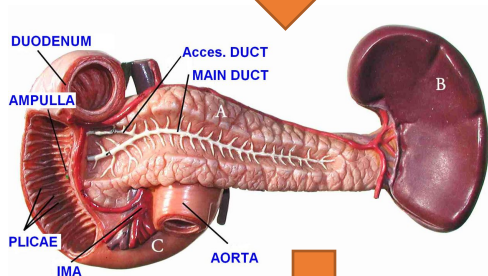
**HYPOTHERMIA**



**SHOCK**



**ALCOHOL**



**GALL STONES**



**MUMPS VIRUS**



**COMMON CAUSES OF PANCREATITIS**



# Pathogenesis

- **Activation of proteolytic enzymes within pancreatic cells, starting with trypsin, leading to local and systemic inflammatory response**
- **In gallstone pancreatitis, this is due to mechanical obstruction of the pancreatic duct by stones**
- In ethanol-related pancreatitis, pathogenesis is unknown
- Mutations prevent the physiological breakdown of trypsin



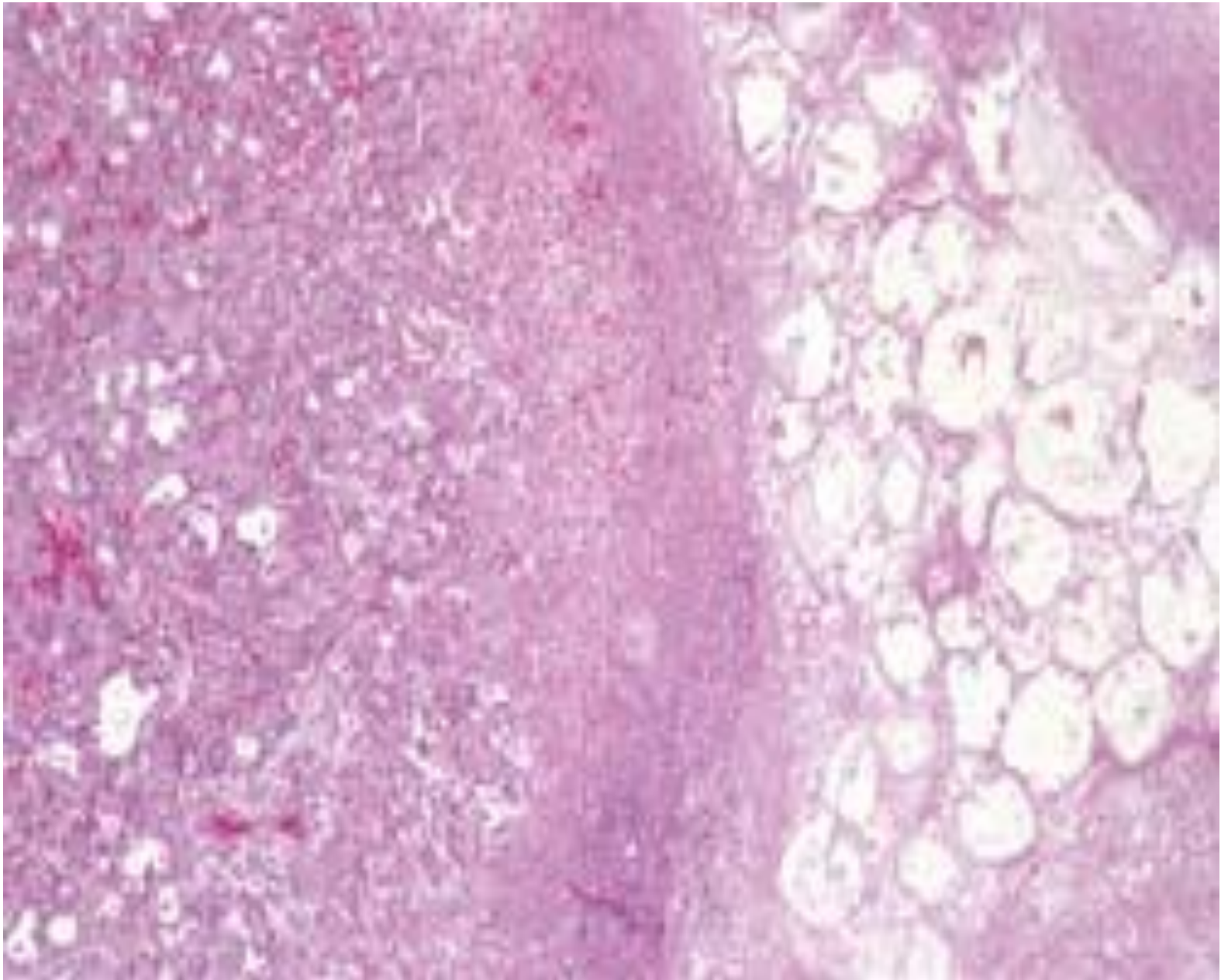


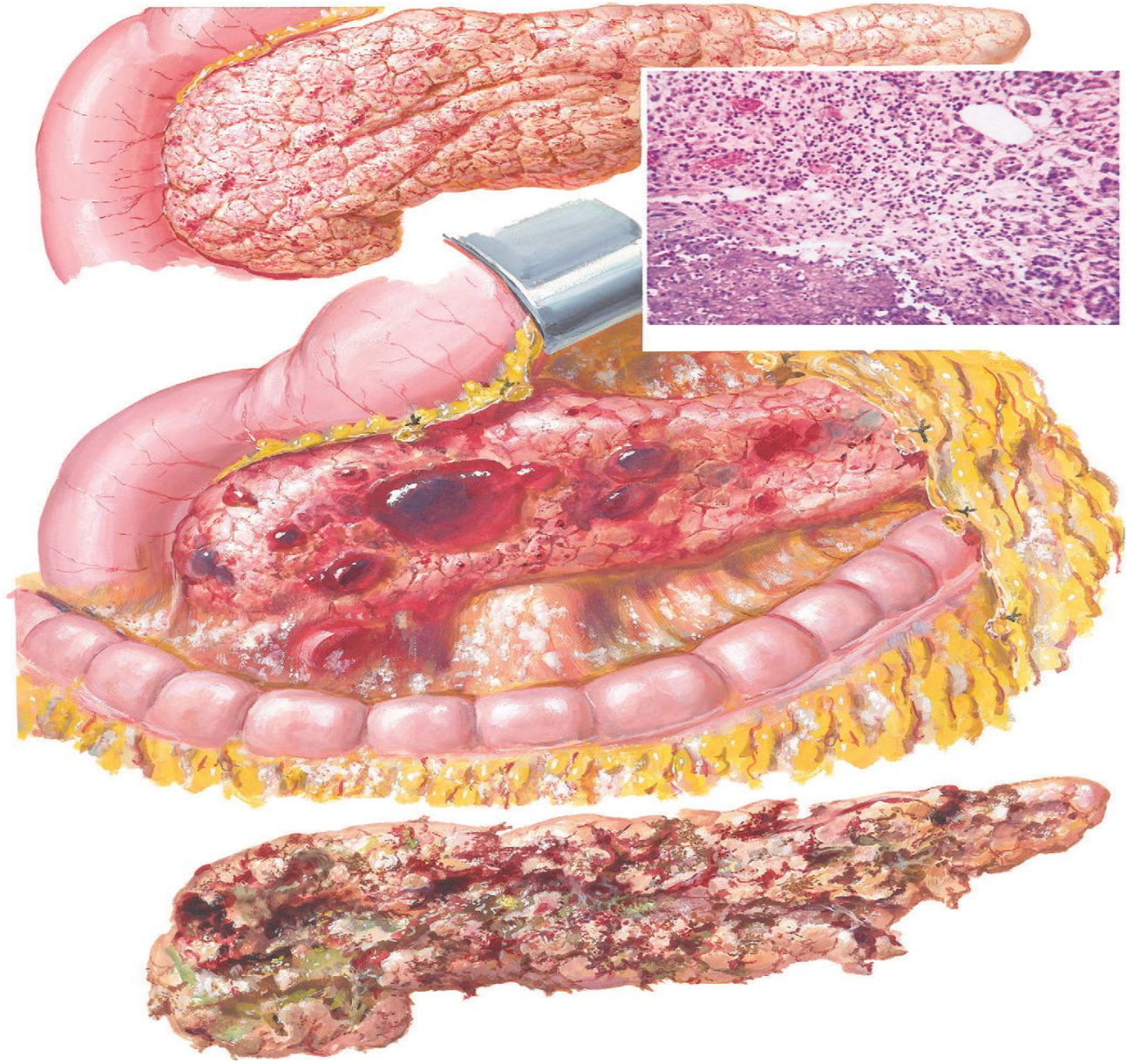
# MORPHOLOGY

- **OEDEMA**
- **FAT NECROSIS**
- **“SAPONIFICATION”**
- **ACUTE INFLAMMATORY INFILTRATE**
- **PANCREAS AUTODIGESTION**
- **BLOOD VESSEL DESTRUCTION**









# CLINICAL FEATURES

- **Pain**: epigastric, noncolicky, constant can radiate to back
  - May improve when leaning forward (ingulfinger's sign)
  - Tender rigid abdomen; guarding
  - **Nausea and vomiting**
  - **Abdominal distention** from paralytic ileus
  - **Fever**: chemical, not due to infection
  - **Jaundice**: compression or obstruction of bile duct
  - **Tetany**: transient hypocalcemia
  - **Hypovolemic shock**: can lead to renal failure
  - **Acute respiratory distress syndrome**
  - **Coma**



# CHRONIC PANCREATITIS

- Repeated episodes of clinically evident acute pancreatitis
- Common cause is alcohol
- Autoimmune pancreatitis
- Cystic fibrosis
- Familial pancreatitis
- Aminoaciduria or hyperparathyroidism
- Fibrosis & exocrine atrophy
- May result in intestinal malabsorption



# CLINICAL FEATURES

- Abdominal Pain
- Vague abdominal symptoms
- chronic diarrhea(mal absorption)
- DM
- pseudocysts
- amylase elevated, or normal



# Investigations

- **laboratory:**

- . increase in serum glucose
- . increase in serum ALP, less commonly bilirubin (jaundice)
- . Serum amylase

- **Radiology:** looking for pancreatic calcifications

- U/S or CT: calcification, dilated pancreatic ducts, pseudocyst

- MRCP or ERCP: abnormalities of pancreatic ducts-narrowing and dilatation

- • **72-h fecal fat test:** measures exocrine function

- **secretin test: gold standard,** measures exocrine function but difficult to perform, unpleasant for the patient, expensive

- **fecal pancreatic enzyme measurement** (elastase-1, chymotrypsin) available only in selected centres

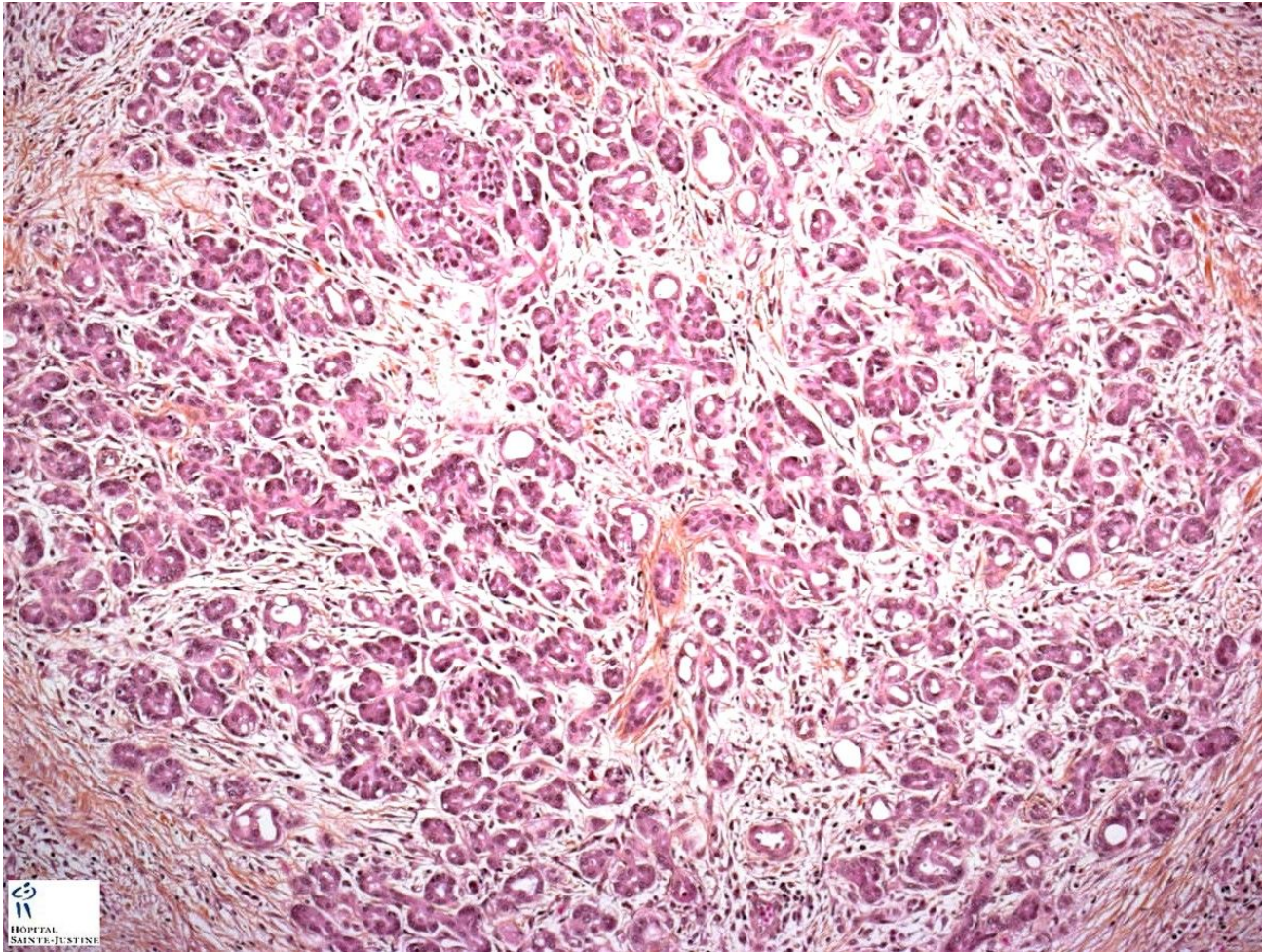




# Management

- **pain**, difficult to control
- general management:
  - . total abstinence from alcohol
  - . enzyme replacement may help pain by resting pancreas via negative feedback analgesics - celiac ganglion blocks
- **endoscopy**: sphincterotomy, stent if duct dilated, remove stones from pancreatic duct
- **surgery**: drain pancreatic duct (resect pancreas if duct contracted)
- □. **restrict fat**,  
**increase carbohydrate and protein** (may also decrease pain)



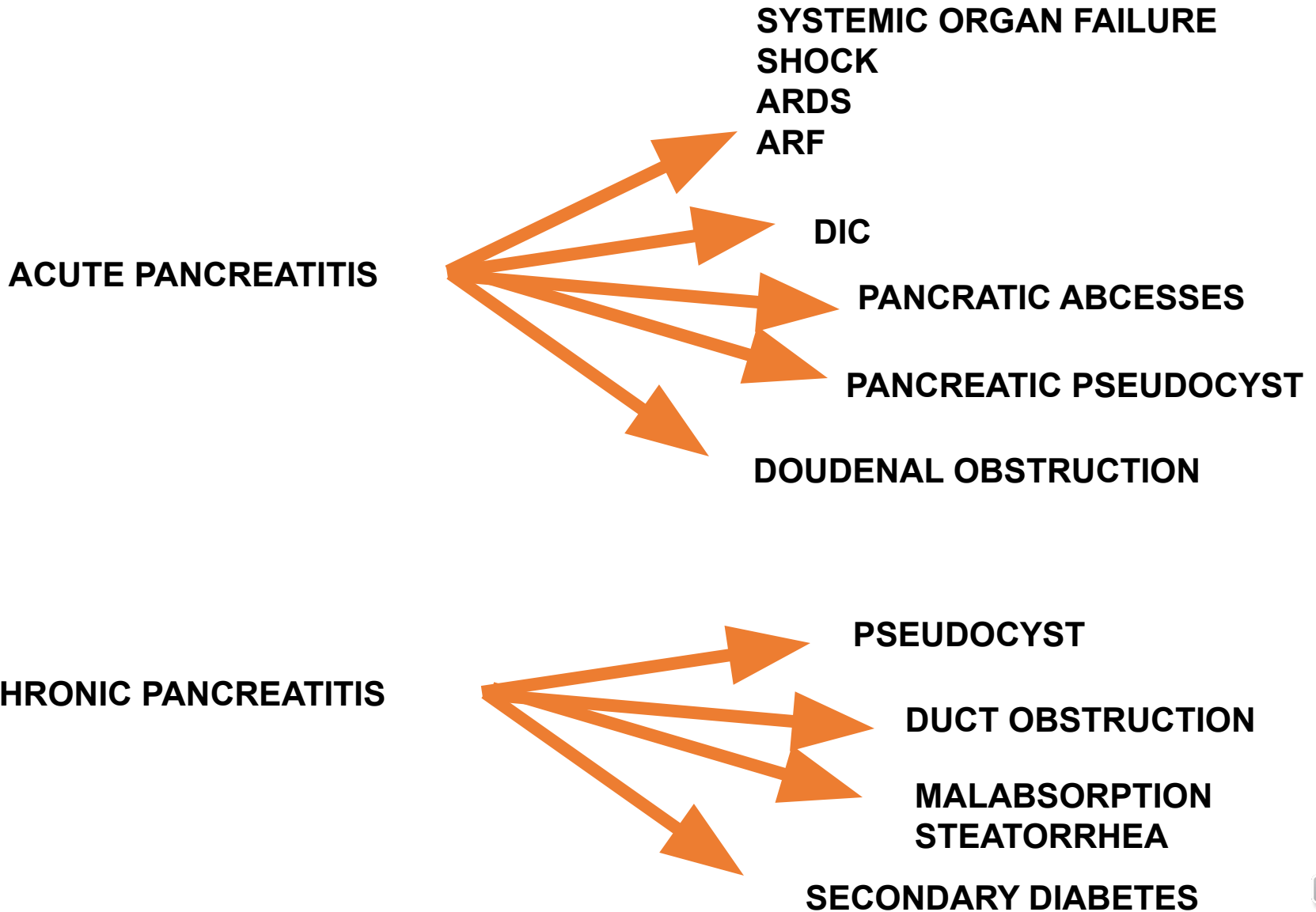


# Cysts & Cystic tumours

- **Pancreatic cysts** are of two types
- **True cysts** which are lined by epithelium and may be congenital
- **Pseudocyst** which lacks an epithelial lining and are usually the result of acute pancreatitis and can be drained surgically
- **True cystic tumours** also occur as benign cystadenoma & malignant cystadenocarcinoma



# CONSEQUENCES of ACUTE and CHRONIC pancreatitis



# CARCINOMA OF THE PANCREAS

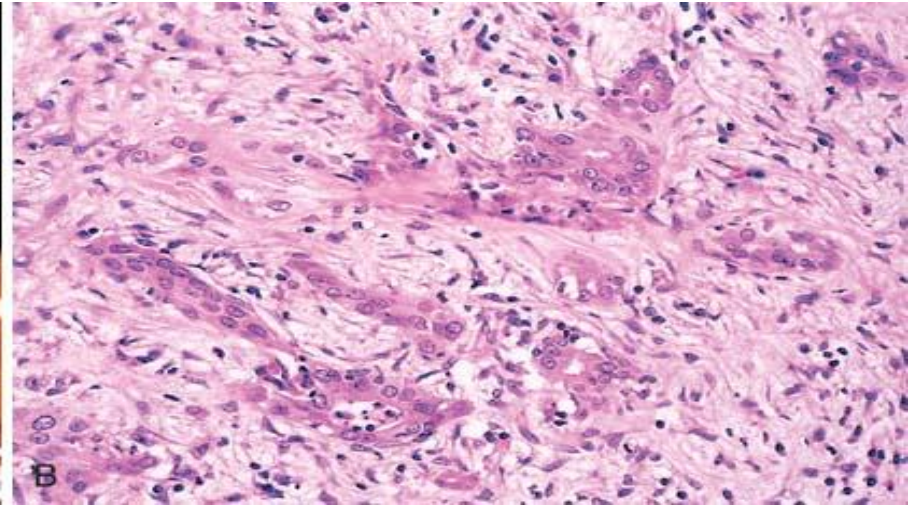
- USUALLY ADENOCARCINOMA
- MAY PRESENT WITH OBSTRUCTIVE JAUNDICE
- VERY POOR PROGNOSIS
- **AETIOLOGY**
  - CIGARETTE SMOKING
  - DM
  - FAMILIAL PANCREATITIS
  - **WEIGHT LOSS**
  - **SYMPTOMS ATTRIBUTABLE TO THE LOCATION OF THE TUMOUR**



# CLINICOPATHOLOGICAL FEATURES

- MOST ARE ADENOCARCINOMA
- MOST COMMONLY ARISE IN THE HEAD OF THE PANCREAS
- COMPRESS THE COMMON BILE DUCT & CAUSE OBSTRUCTIVE JAUNDICE
- EXTENSIVE REPLACEMENT BY CARCINOMA CAN LEAD TO DM.
- SPREAD BY LYMPH & BLOOD TO THE LIVER





# Pancreatic Adenocarcinoma



# REMEMBER

- **Painless jaundice in an elderly person is CARCINOMA of the head of the pancreas until proven otherwise**





**THANK YOU**

