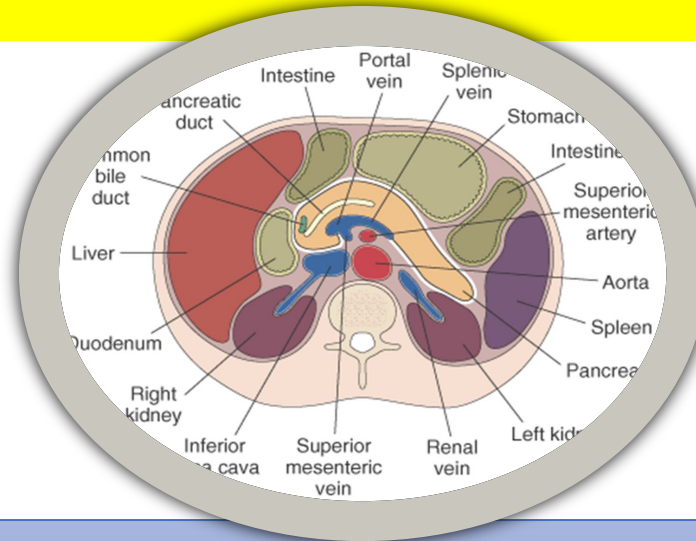


ELRAZI UNIVERSITY FACULTY OF MEDICINE



PATHOLOGY OF THE EXOCRINE PANCREAS

GAMAL ELIMAIRI



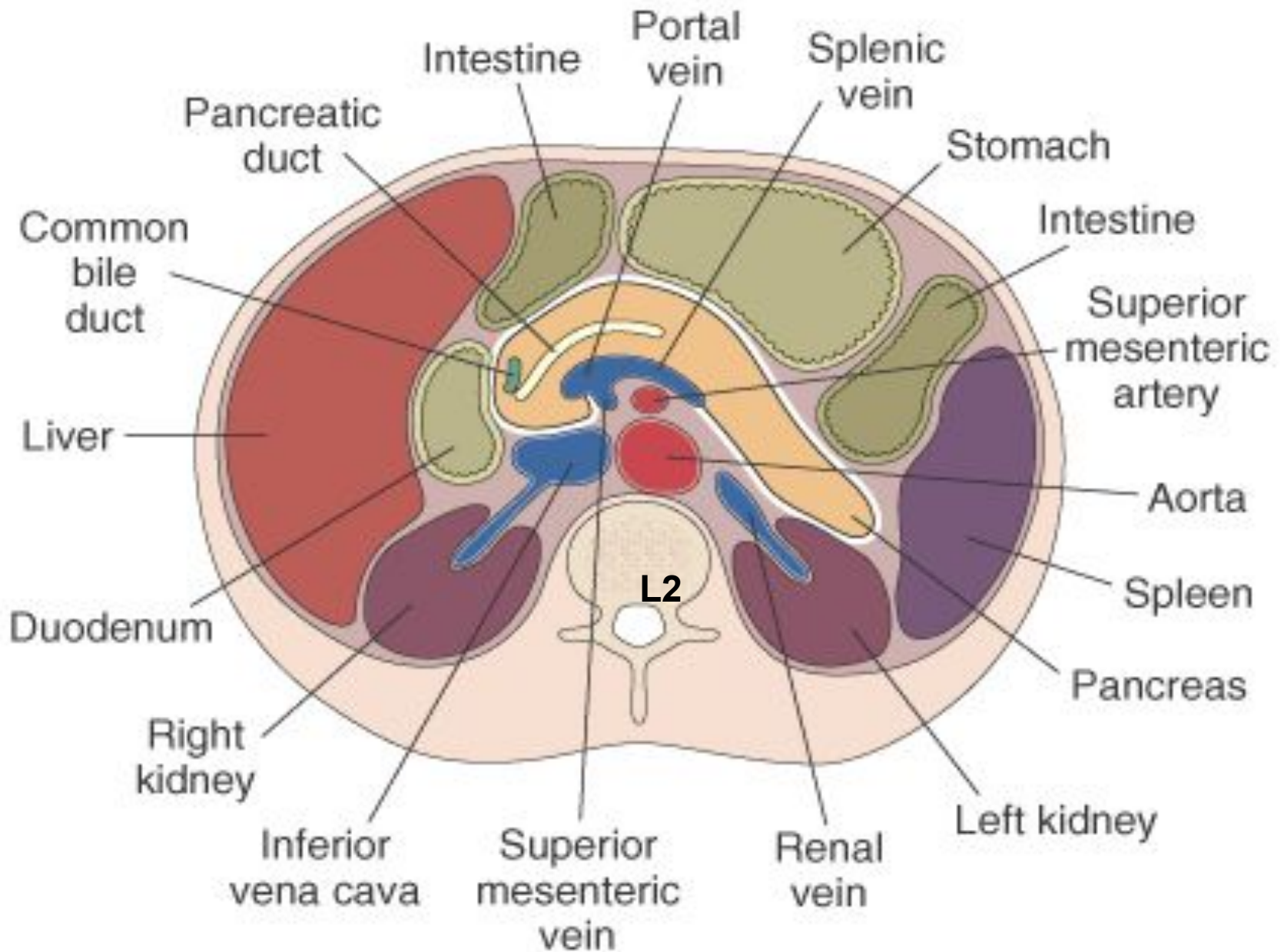
EXOCRINE PANCREAS

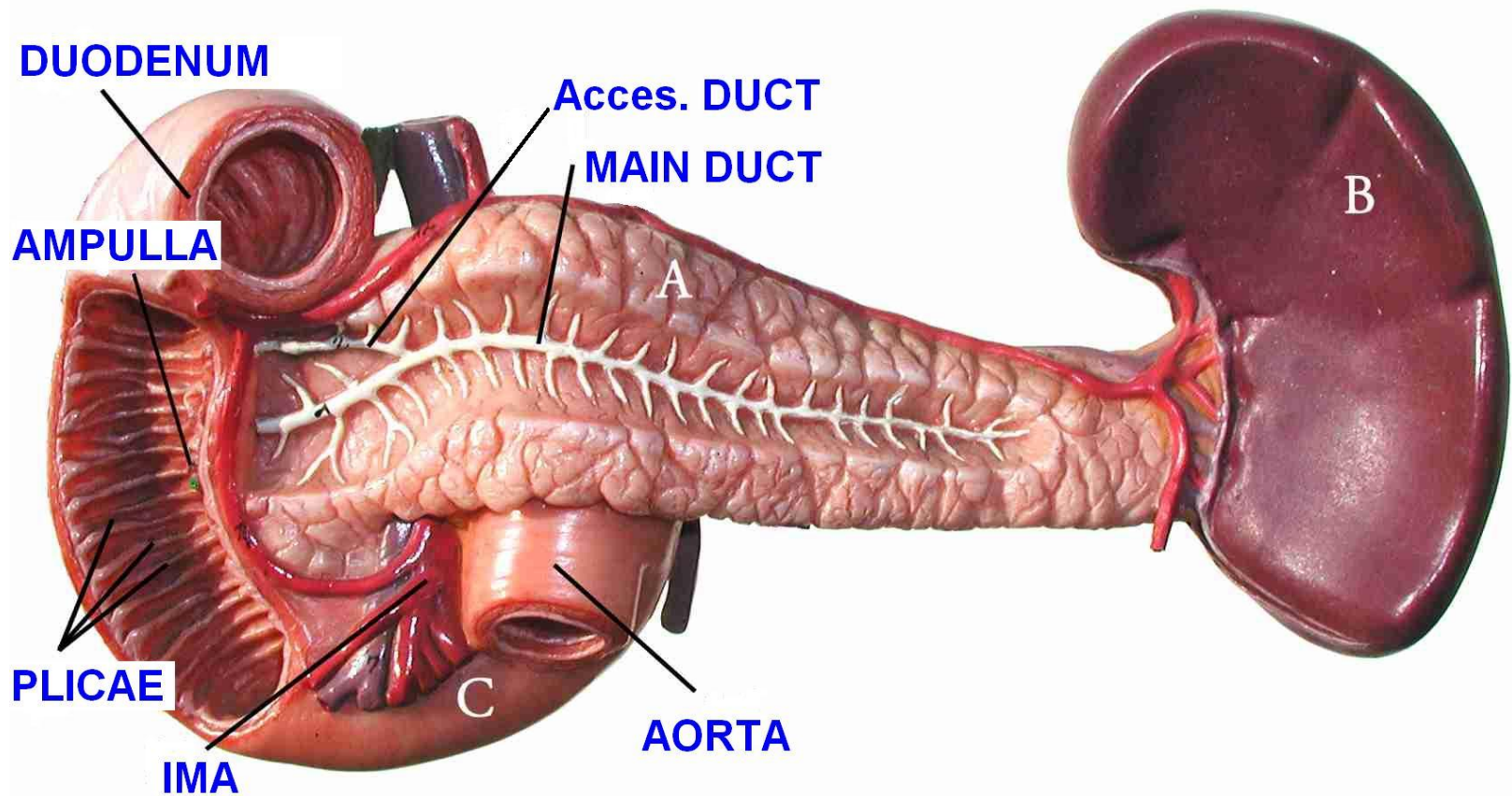


OBJECTIVES

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



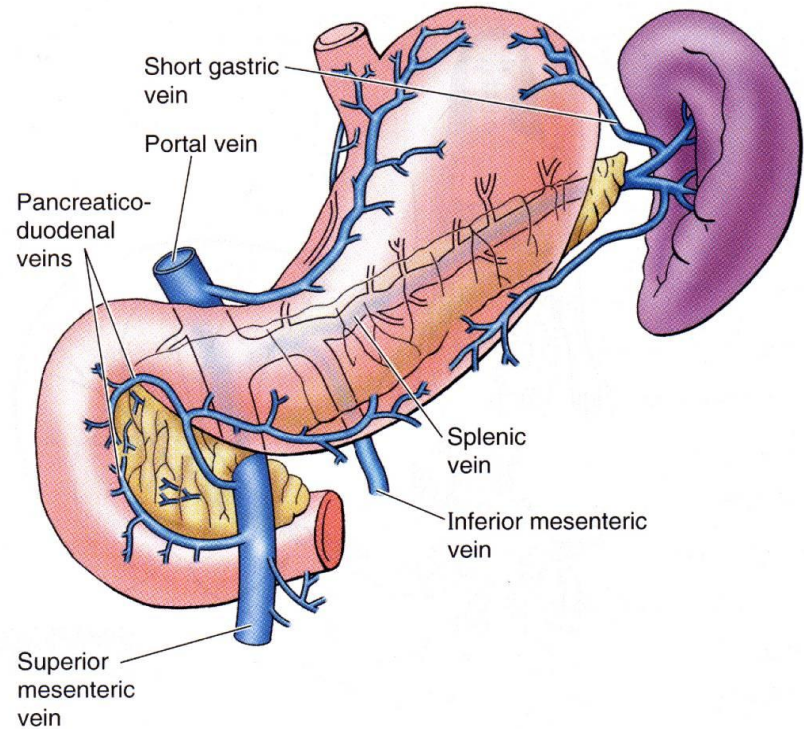
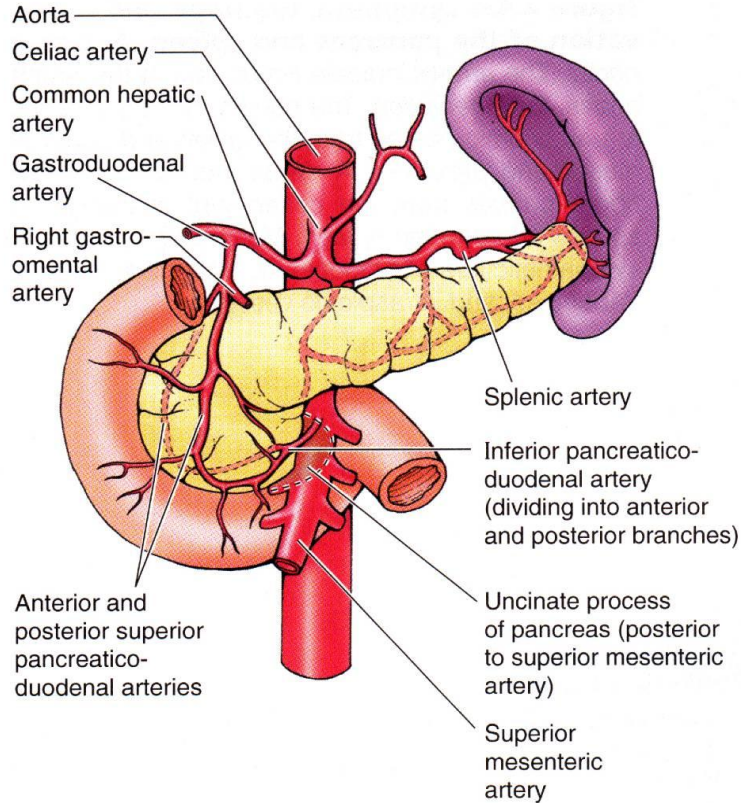




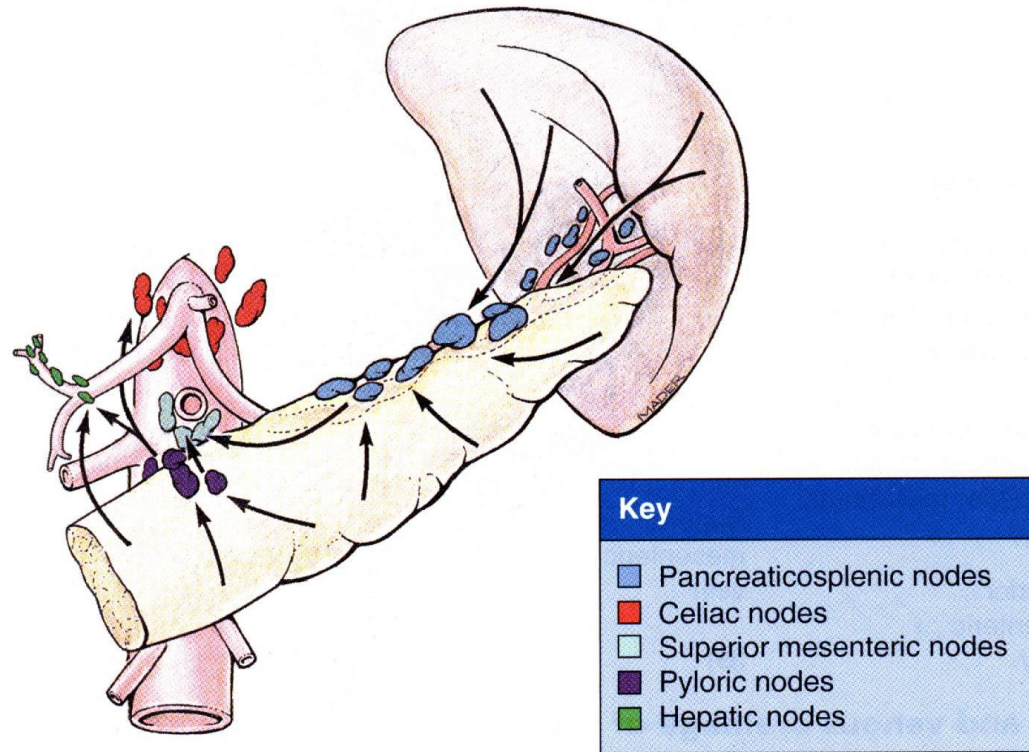
PANCREAS



Arterial supply and venous drainage of the pancreas and spleen



Lymphatic drainage of the distal pancreas and spleen

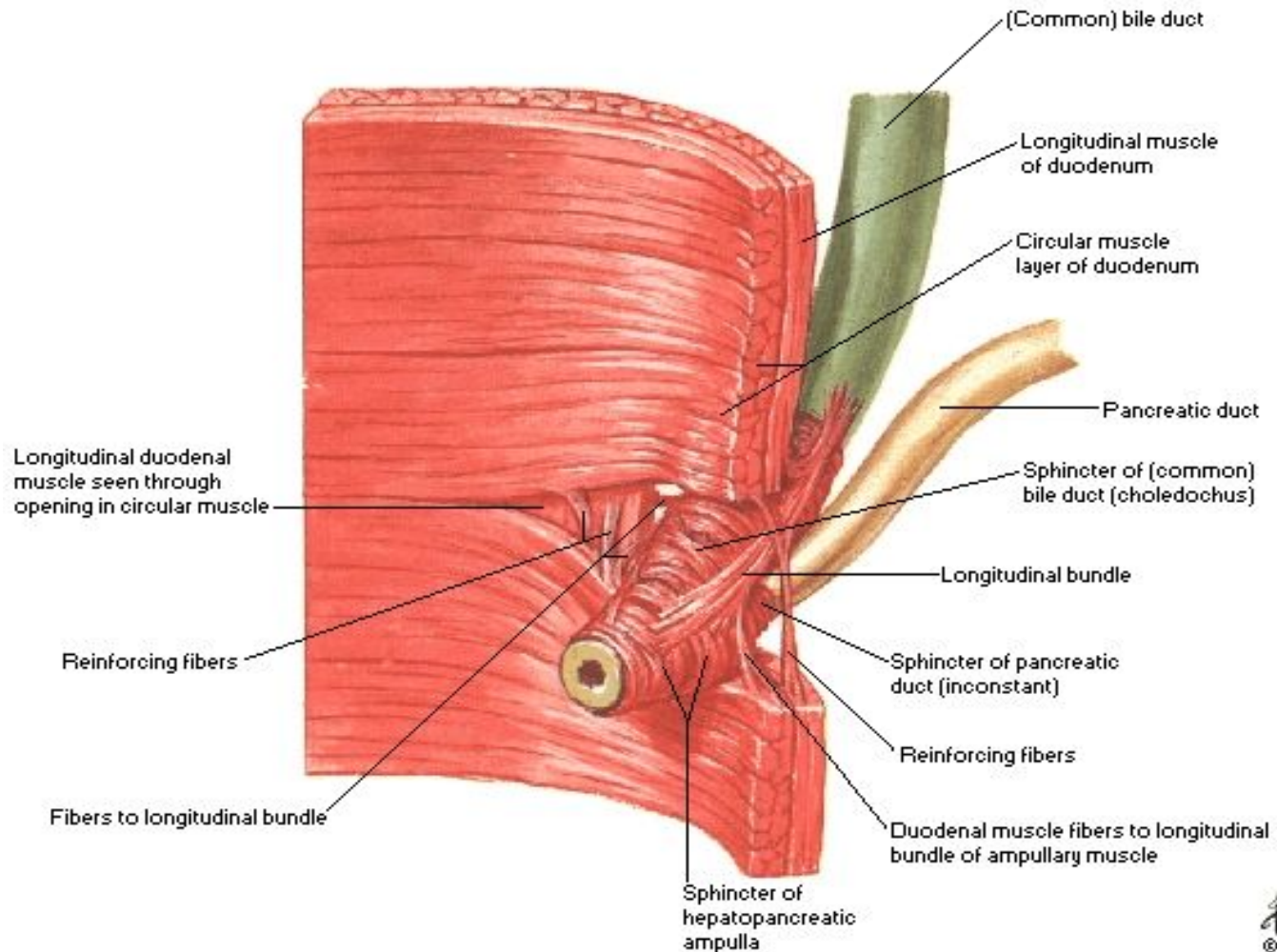


“Peri-”pancreatic lymph nodes, several groups.



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)

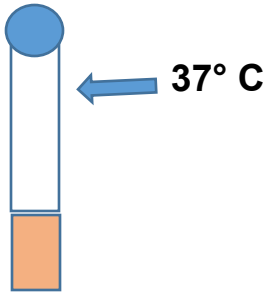


ACUTE PANCREATITIS

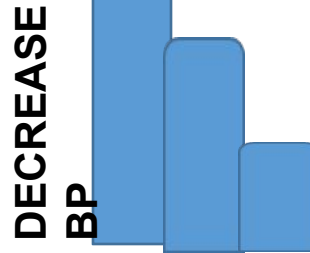
- **Idiopathic:**
- **Gallstones** (45%)
- **Ethanol** (35%)
- **Tumours:** pancreas, ampulla,
- **Scorpion stings**
- **Microbiological** □.bacterial: □.viral: (mumps, varicella) □.parasites:
Autoimmune: SLE, polyarteritis nodosa (PAN), Crohn's
- **Surgery/trauma**
- **abdomen, penetrating peptic ulcer**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



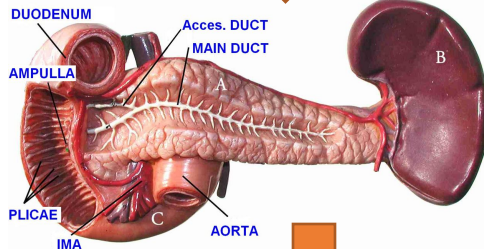
HYPOTHERMIA



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

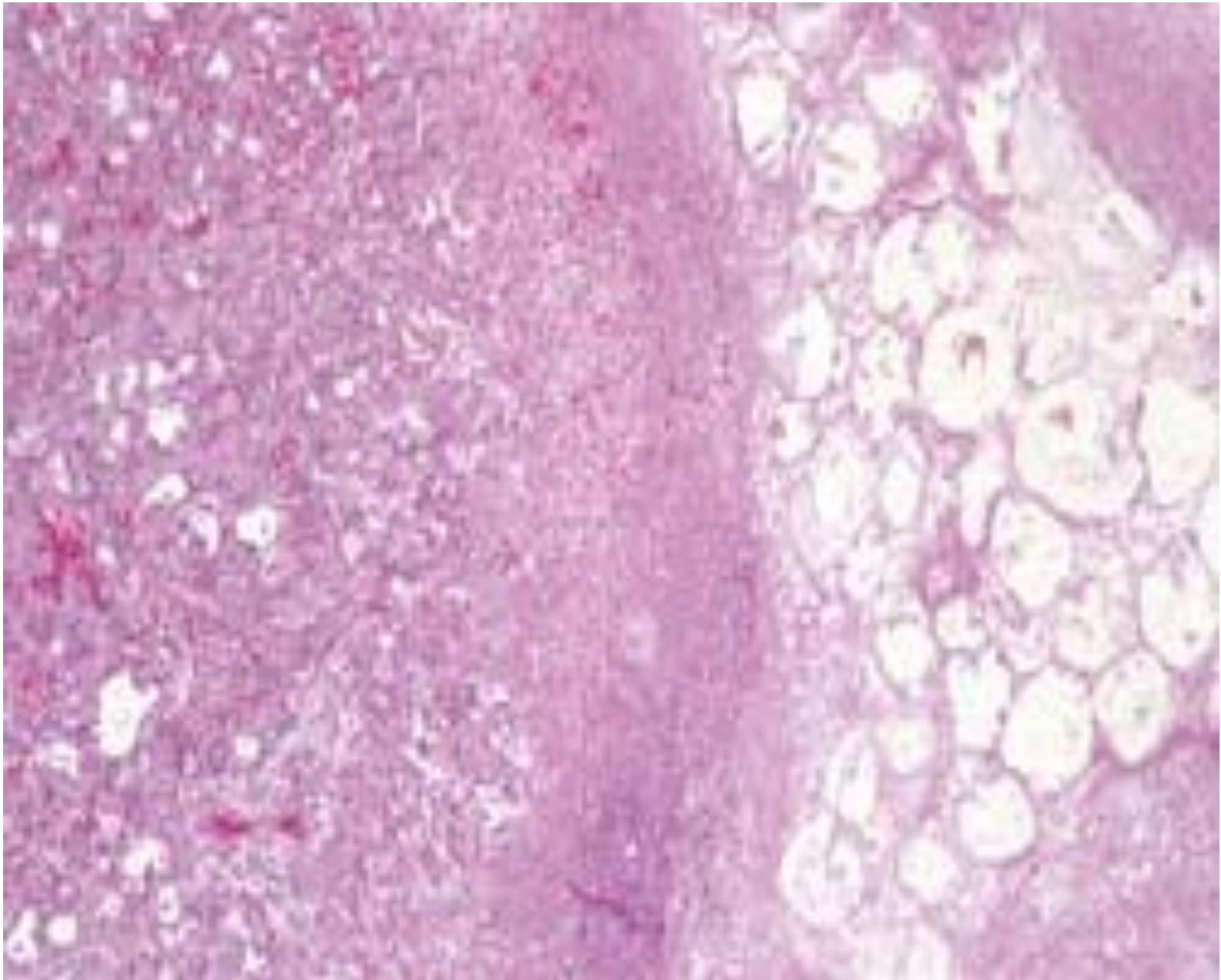


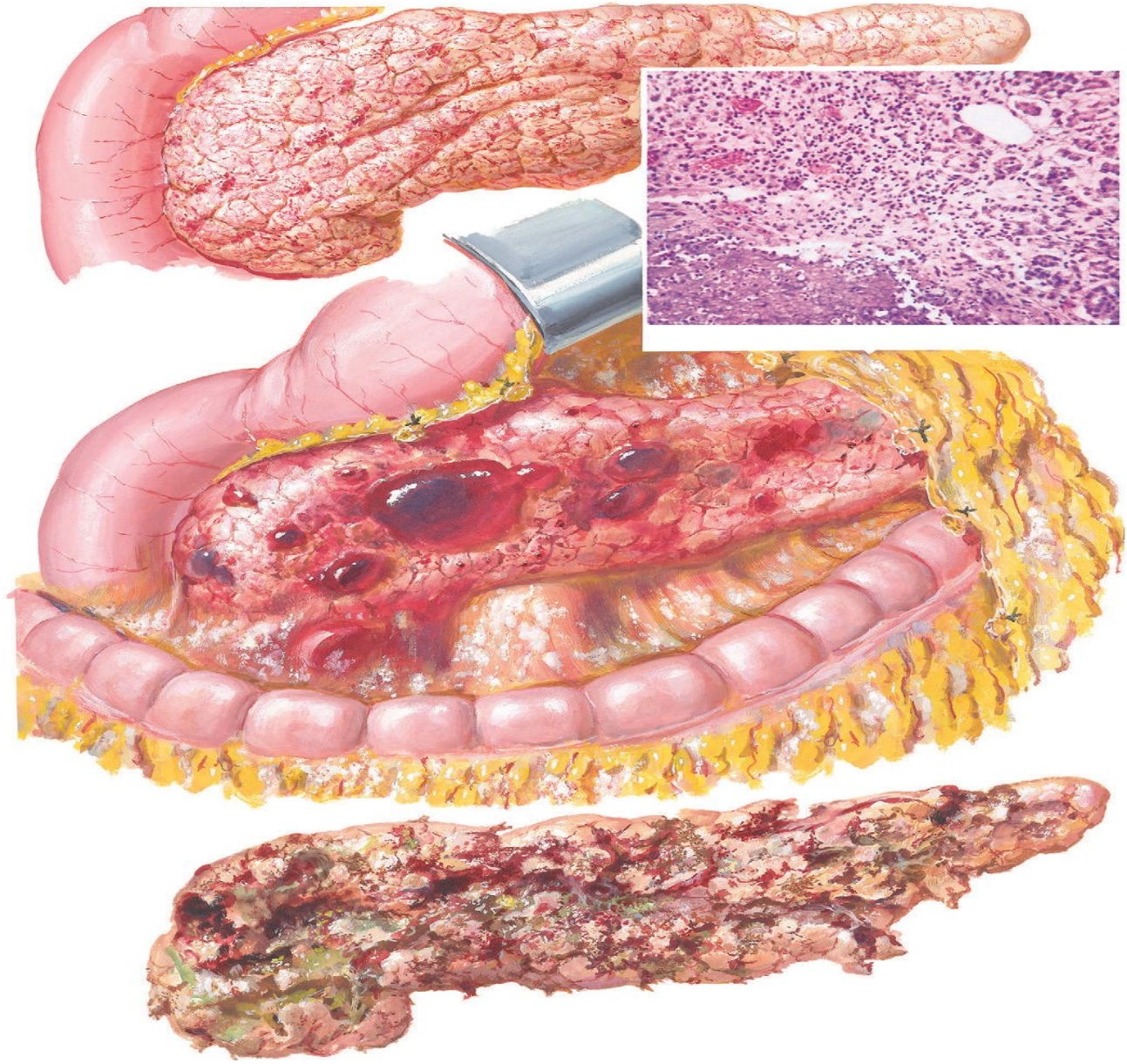
MORPHOLOGY

- **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

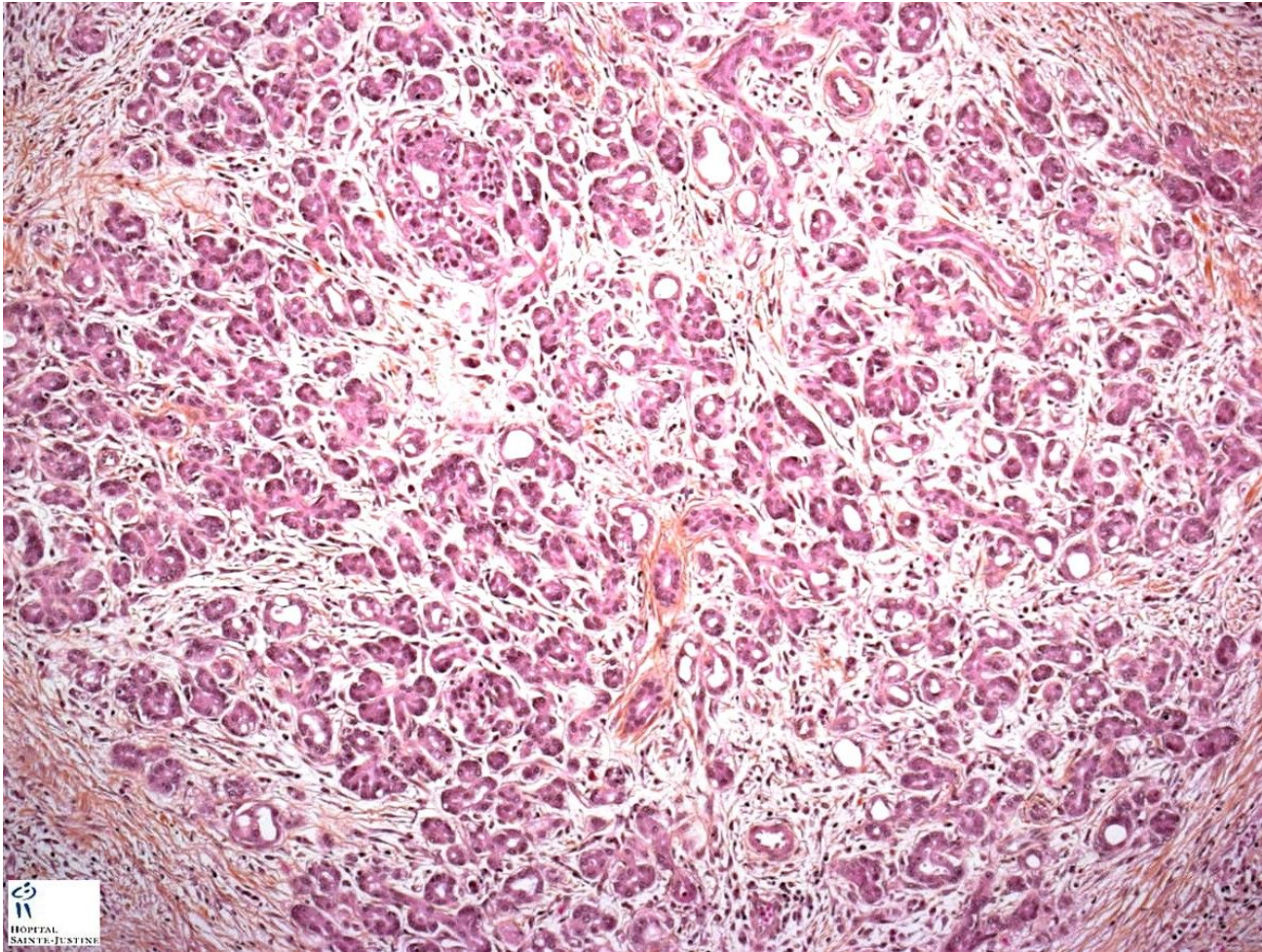
- **fecal pancreatic enzyme measurement** (elastase-1, chymotrypsin) available only in selected centres



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)



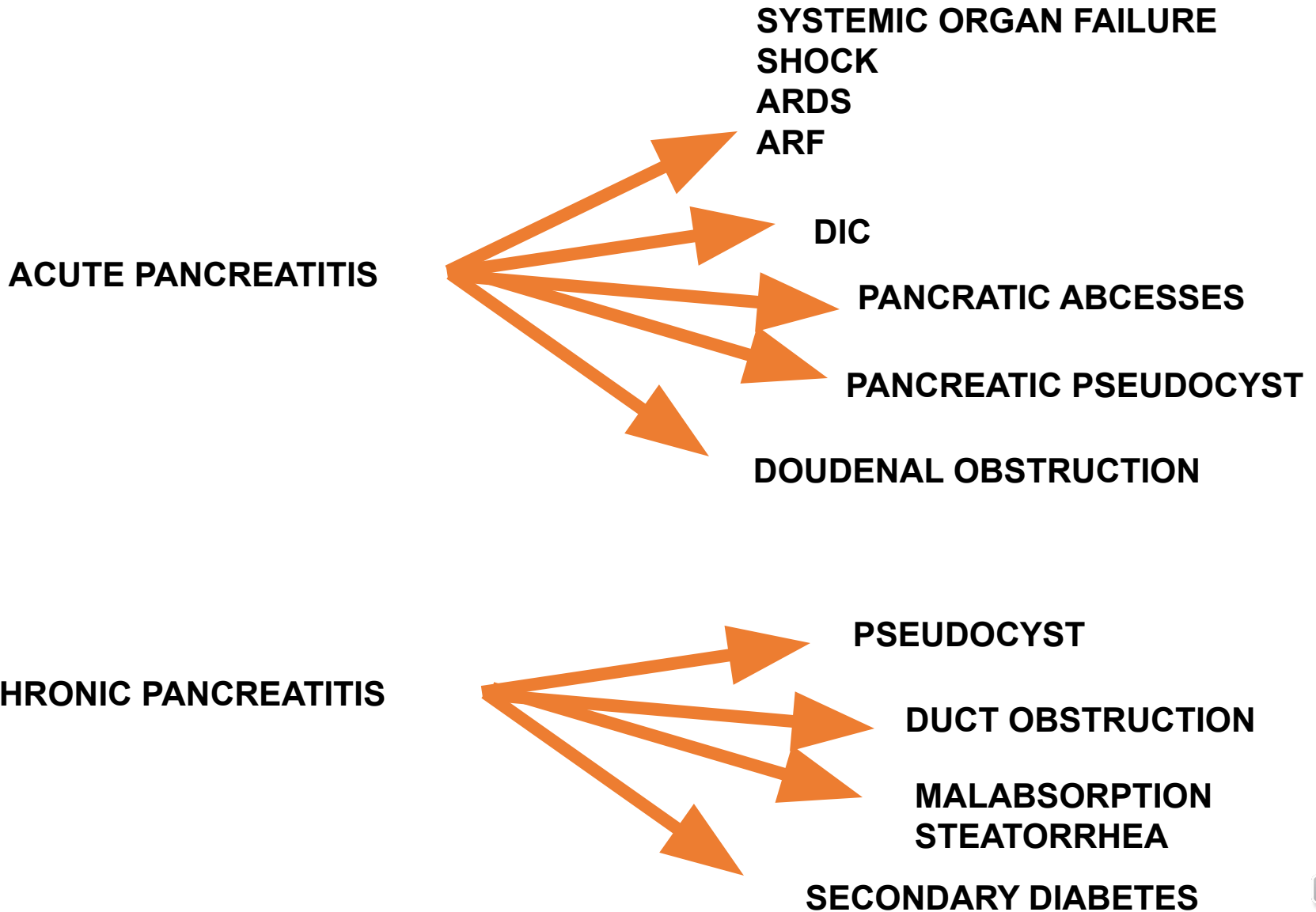


Cysts & Cystic tumours

- **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

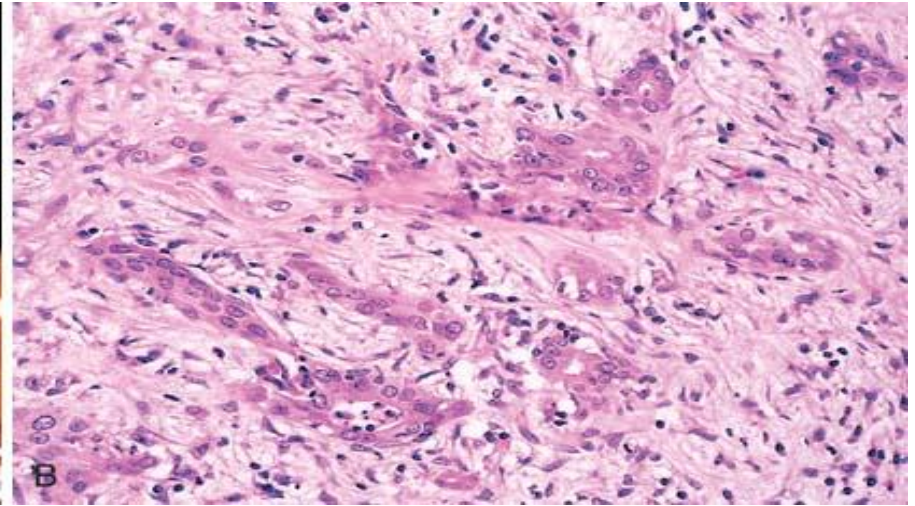
- USUALLY ADENOCARCINOMA
- MAY PRESENT WITH OBSTRUCTIVE JAUNDICE
- VERY POOR PROGNOSIS
- **AETIOLOGY**
 - CIGARETTE SMOKING
 - DM
 - FAMILIAL PANCREATITIS
 - WEIGHT LOSS
 - SYMPTOMS ATTRIBUTABLE TO THE LOCATION OF THE TUMOUR



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

