

# ACUTE PANCREATITIS

GUIDED BY:-  
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**GROUP 13(ROLL NO 61-  
65)**

**NIDHI MODI(61)**

**VISHAL MODI(62)**

**DHVANI NAIK(63)**

**HITESH NAKUM(64)**

**NARENDRA MEENA(65)**

# PATIENT HISTORY

- Name - XYZ
- Age -70 years
- Gender - Female
- Occupation - Farming

- Complaints

- pain in right hypochondriac region

- pain in epigastric region

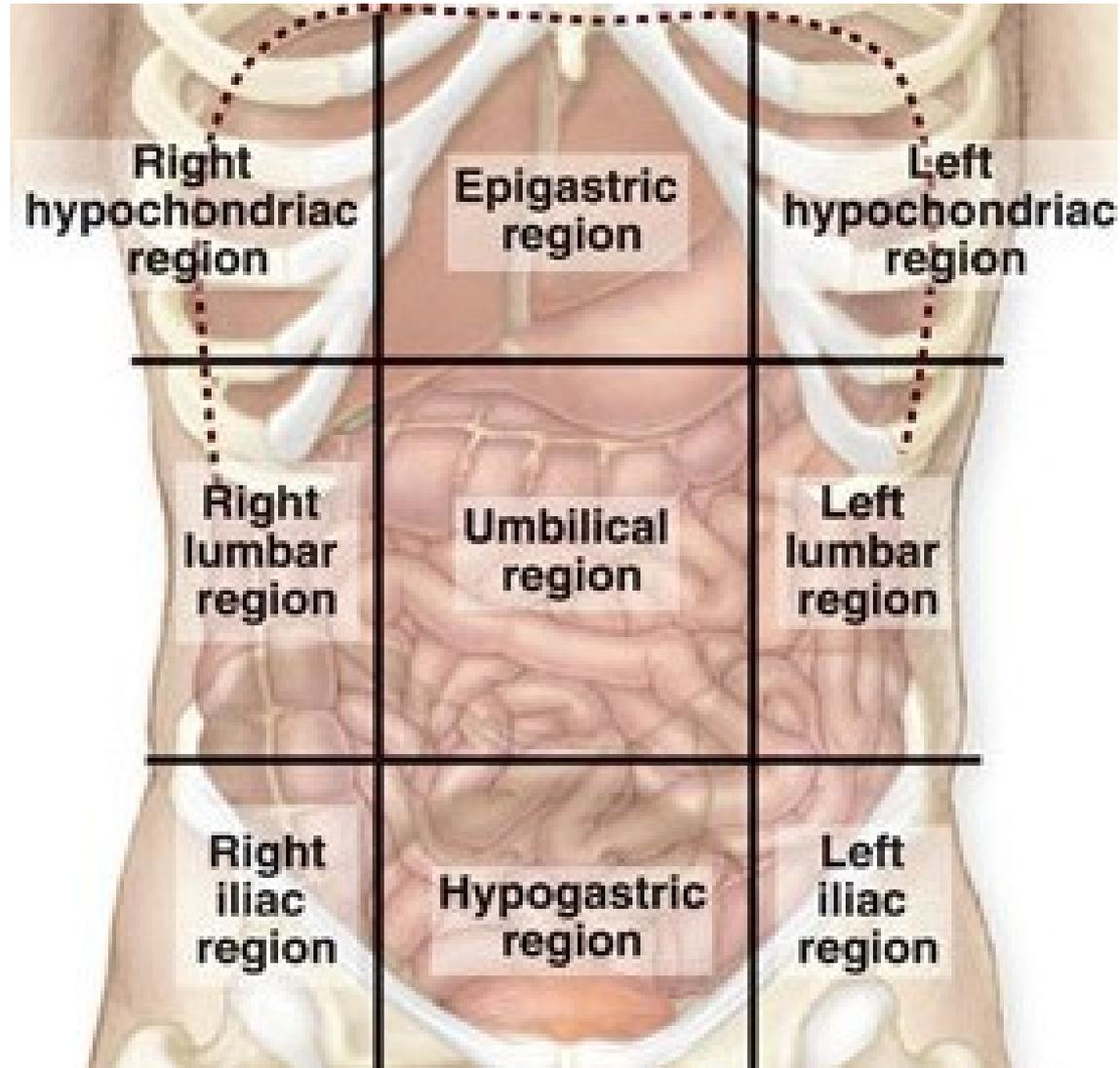
- loss of appetite,

- vomiting

- No past medical history

- When admitted had hypertension (190/80 mm Hg)

# 9 QUADRANTS OF ABDOMINAL REGION



# ULTRASONOGRAPHY DEFINITION

- Medical ultrasound is a diagnostic imaging technique based on the application of ultrasound.
- It is used to see internal body structures such as tendons, muscles, joints, vessels & internal organs.
- Here doctors use ultrasonography of abdomen.

- Abdominal ultrasonography is an type of imaging test. It is used to examine organs in the abdomen including the liver, gallbladder, spleen, pancreas & kidneys.
- The blood vessels that lead to some of these organs can also be looked with ultrasound

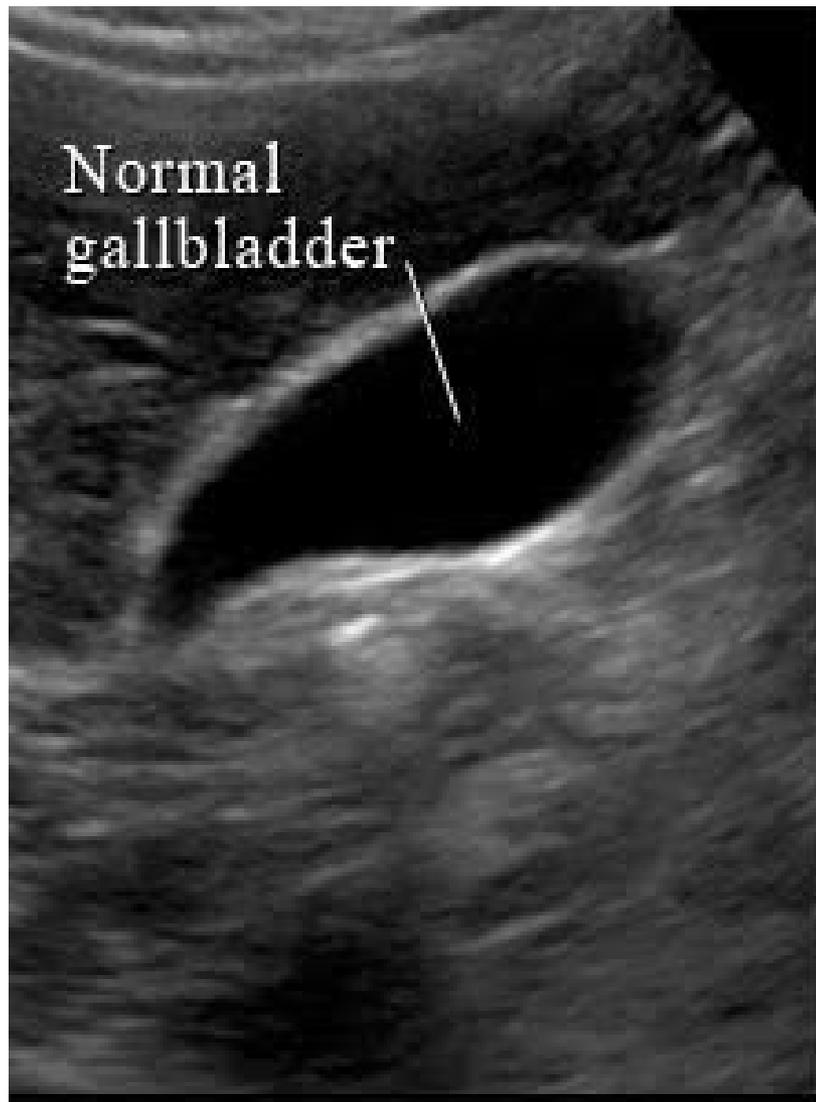


Figure 1



Figure 2

# LIVER FUNCTION TEST(LFT)

- Commonly used tests to check liver function are the alanine transaminase (ALT), aspartate aminotransferase (AST), albumin and bilirubin tests.
- The ALT and AST tests measure enzymes that your liver releases in response to damage or disease.

## WHY ALT RAISED?

- Bile is a yellow-green fluid that is made by liver, stores in gallbladder and passes through the common bile duct into the duodenum where it helps digest fat.
- The principal components of bile are cholesterol, bile salts and pigment bilirubin.

- There is a gallstone between gallbladder and common bile duct so bile cannot pass away and go in backward direction.
- Hepatocyte or liver cells are also made up from proteins, lipids and carbohydrates. The bile denatured this proteins so cells are ruptured.

- Hepatocyte are supplied by blood vessels so ALT from these ruptured cells goes into the blood, so ALT increases in the blood.

WHY BILIRUBIN IS NORMAL ?

- Because there is a narrow gap between gallstone and the wall of common bile duct, so small amount of bilirubin was secreted.

# ASPARTATE AMINOTRANSFERASE (AST)

- An aspartate aminotransferase test measures the amount of this enzyme in the blood.
- AST is normally found in red blood cells, liver, heart, muscle tissue, pancreas and kidneys. Low level of AST are normally found in the blood.

- When body tissue or organ such as liver is damaged, additional AST is released into the blood stream.
- The amount of AST in the blood is directly related to the extent of the tissue damage.

- After severe damage, AST levels rise in 6 to 10 hours & remain high for about 4 days.
- The AST test may be done at the same time as a test for ALT.
- The ratio of ALT to AST sometimes can help determine whether the liver or another organ has been damaged.
- Both ALT & AST levels can test for liver damage.

# REPORT AFTER ADMISSION

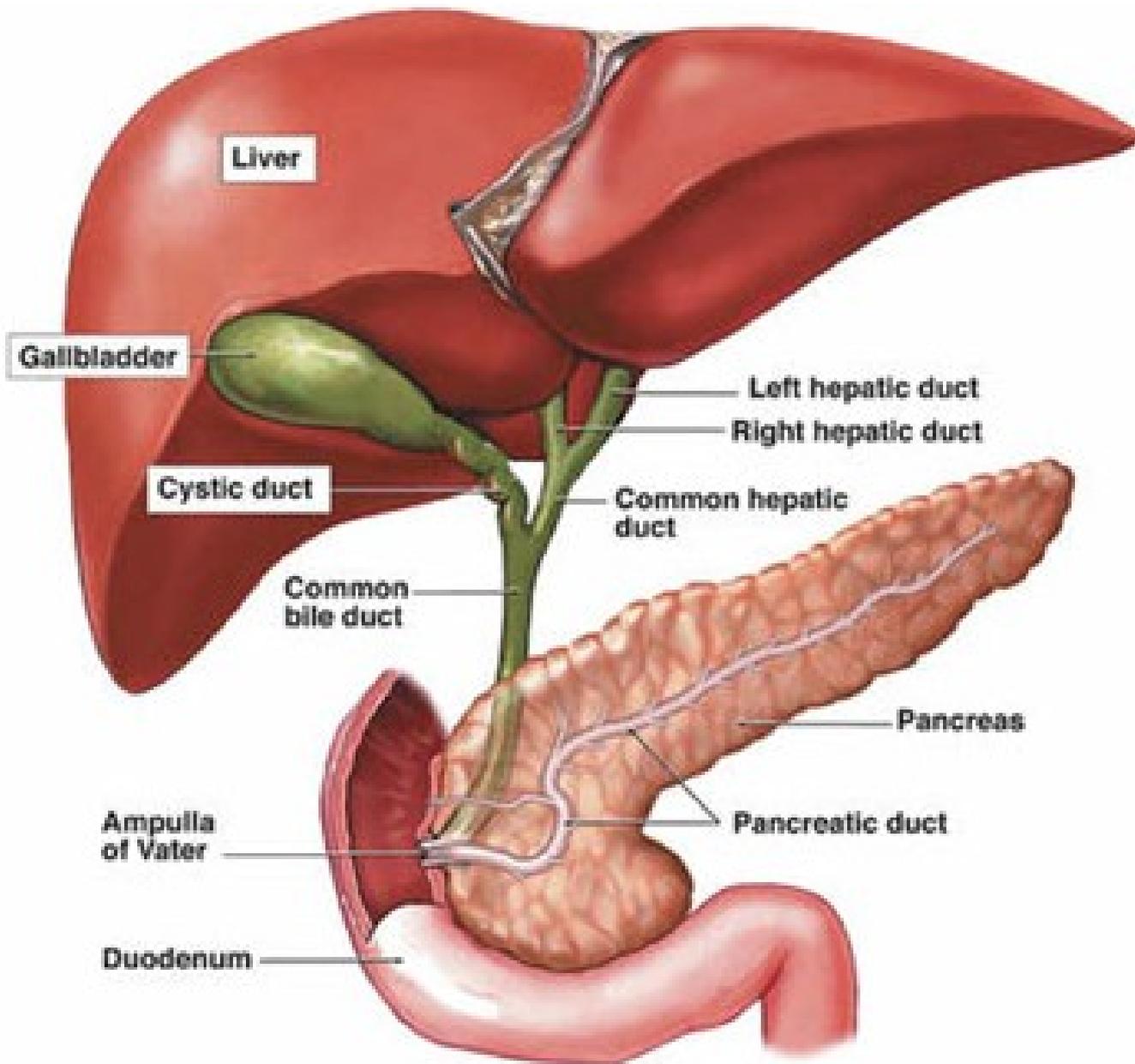
Day of Admission	Date	Examination	Result	Reference range
1 <sup>st</sup> day	29/9/2016	ALT	61 U/L	<45 U/L
4 <sup>th</sup> day	2/10/2016	ALT	28 U/L	<45 U/L
7 <sup>th</sup> day	5/10/2016	ALT	112 U/L	<45 U/L
9 <sup>th</sup> day	7/10/2016	ALT	65 U/L	<45 U/L
11 <sup>th</sup> day	9/10/2016	ALT	39 U/L	<45 U/L

Surgery was suggested to the patient. But on 7<sup>th</sup> day after admission the patient had abdominal pain, thus surgery was cancelled and further examination was done.

- Due to abdominal pain doctor decided to check amylase and lipase levels in blood.
- They were found to be high so it was diagnosed that the stone had moved from common bile duct to ampulla of Vater and was now affecting the pancreatic secretion causing “ACUTE PANCREATITIS”.

# WHAT IS AMPULLA OF VATER ?

- The ampulla of Vater, also known as the hepatopancreatic ampulla or the hepatopancreatic duct, is formed by the union of the pancreatic duct and the common bile duct.



Longitudinal muscle  
Circular muscle  
Submucosa  
Mucosa

Common bile duct

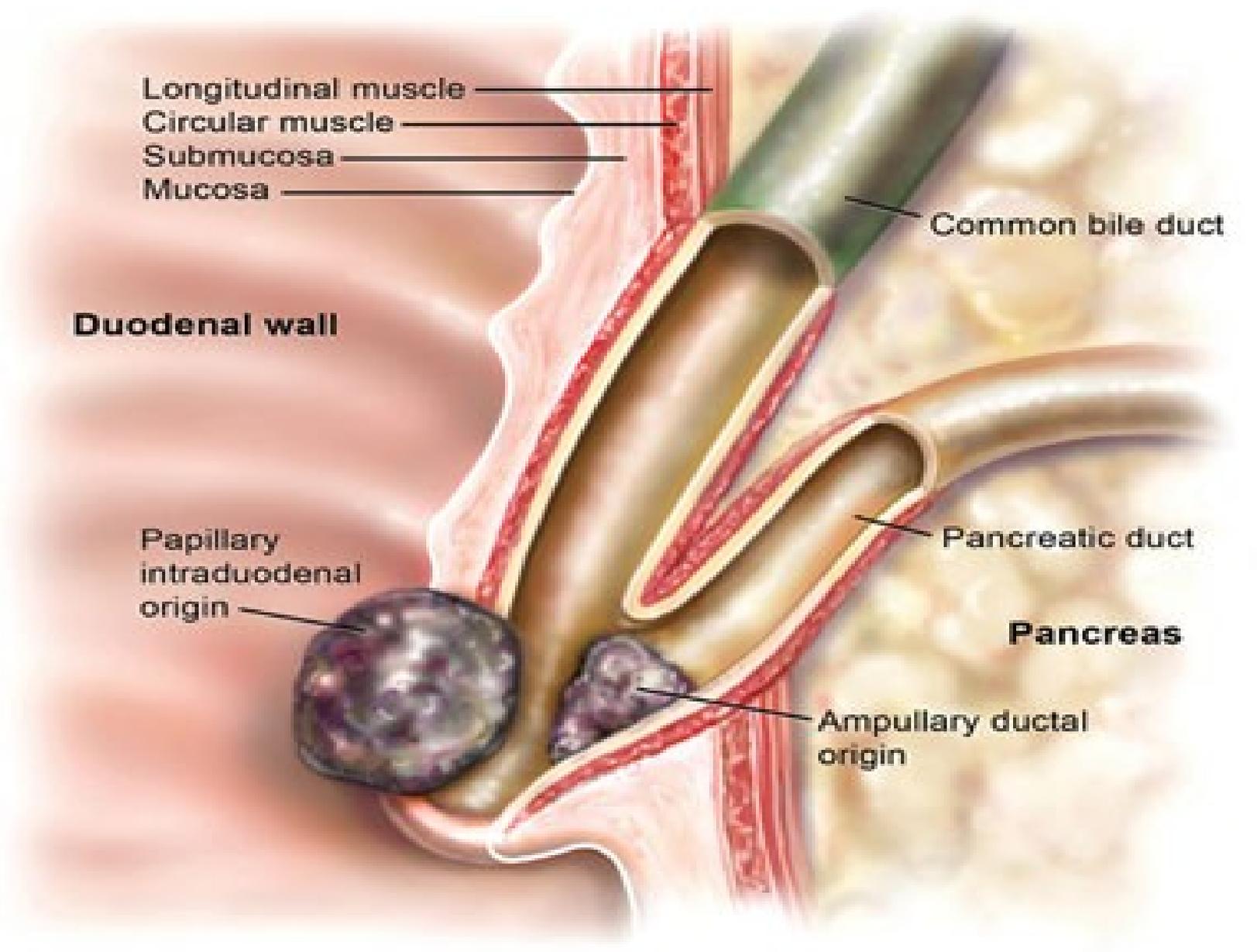
**Duodenal wall**

Papillary  
intraduodenal  
origin

Pancreatic duct

**Pancreas**

Ampullary ductal  
origin



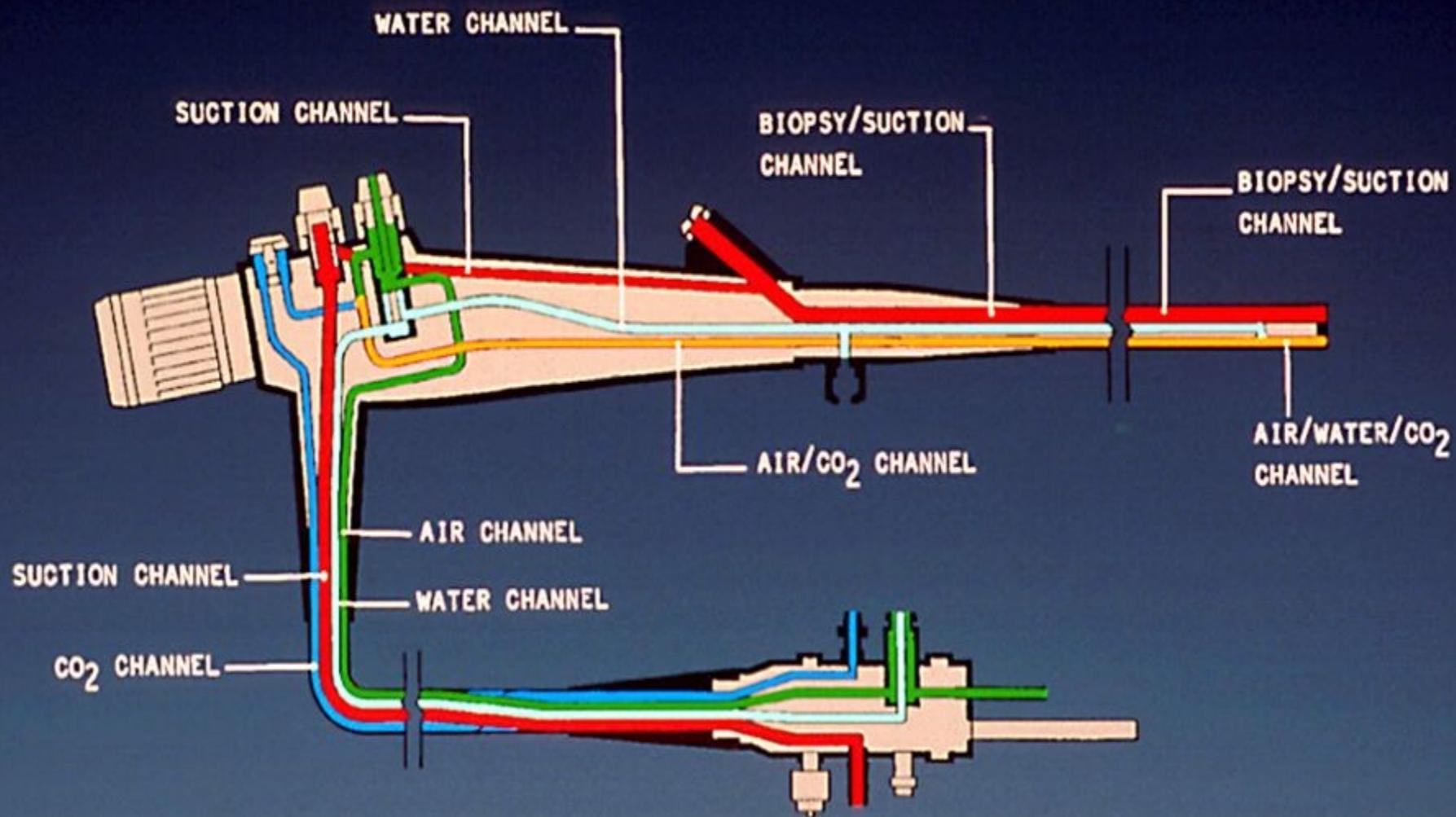
# ERCP

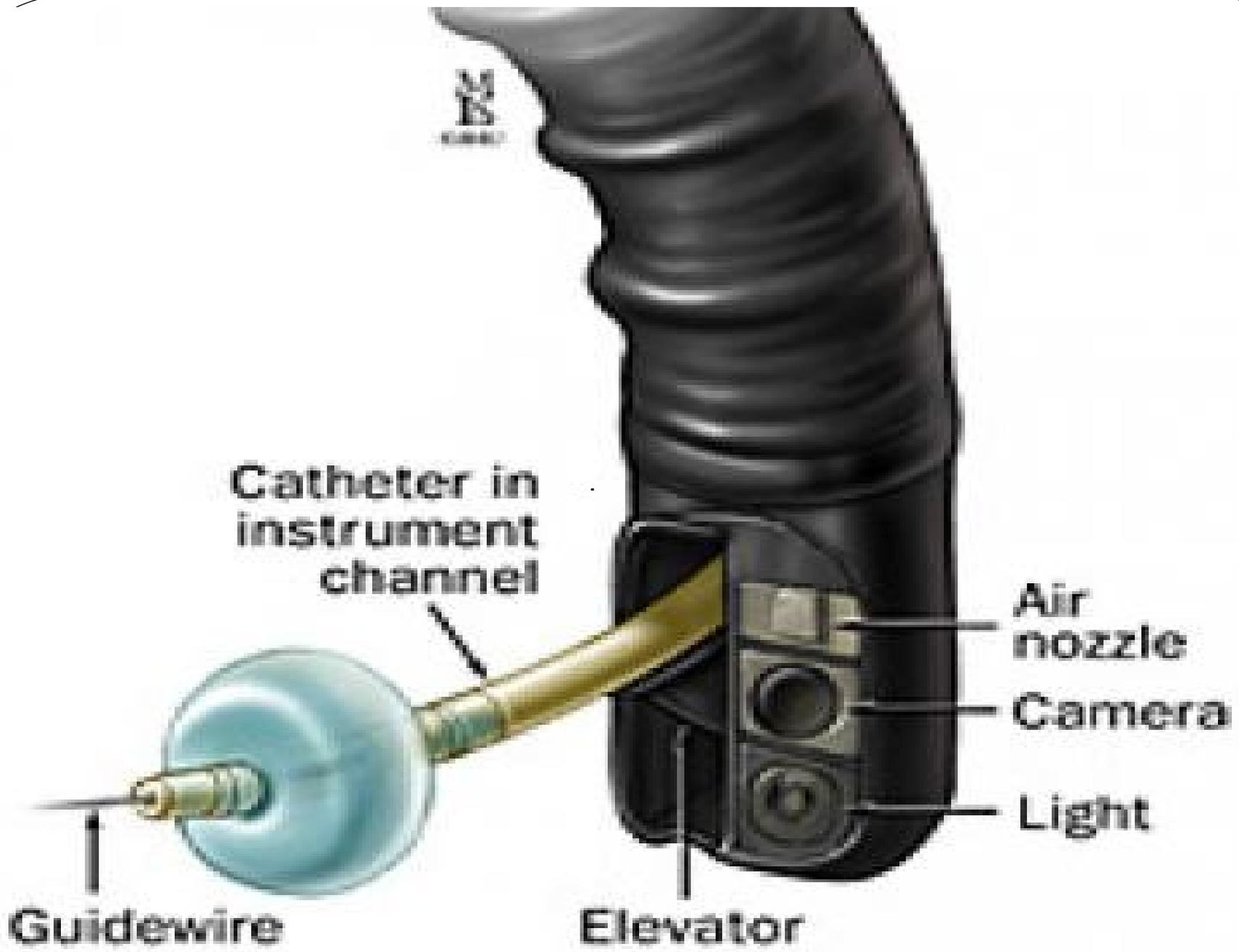


**ERCP**

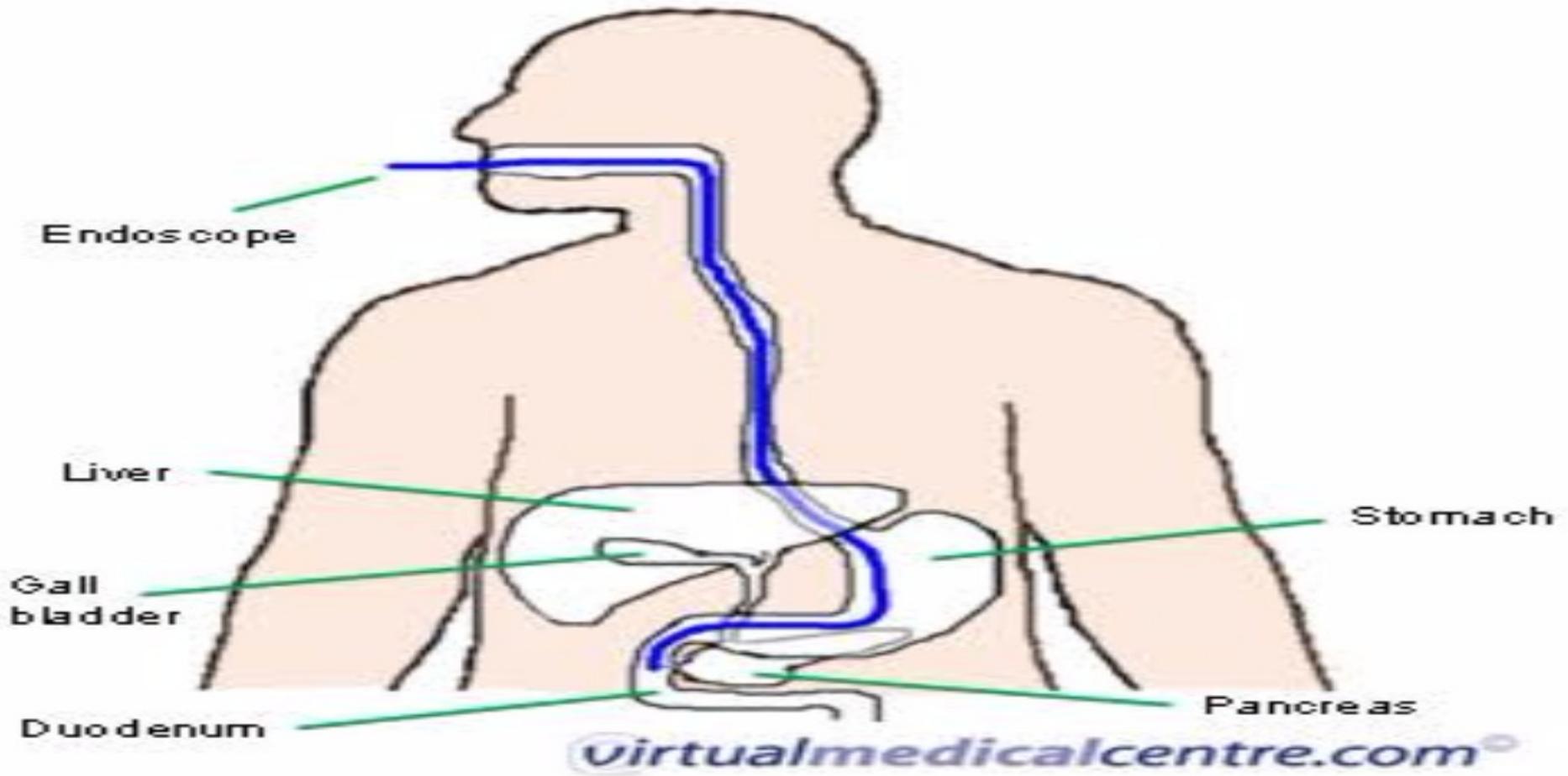
**ENDOSCOPIC  
RETROGRADE CHOLANGIO-  
PANCREATO GRAPHY**

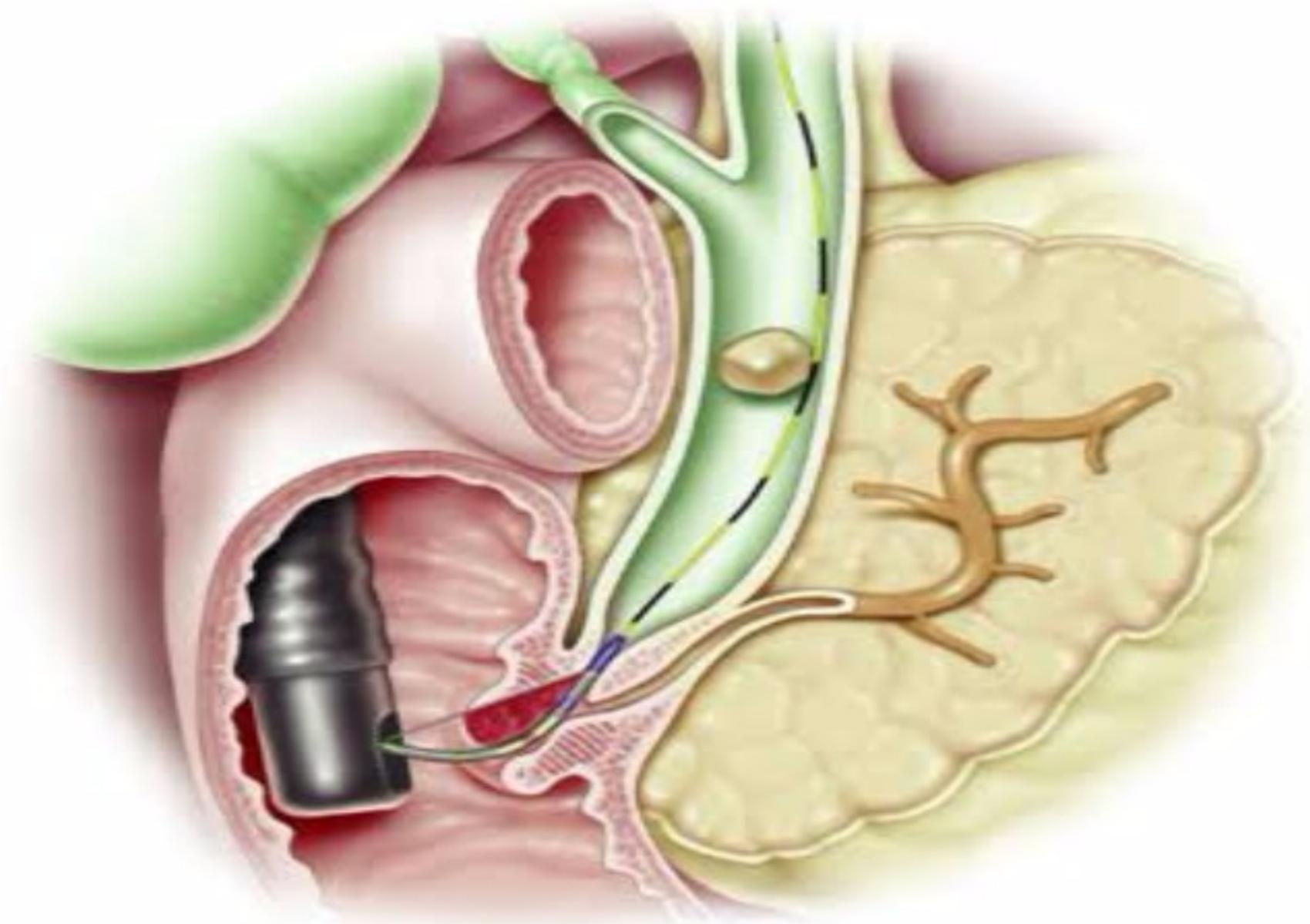
# ENDOSCOPE CHANNELS



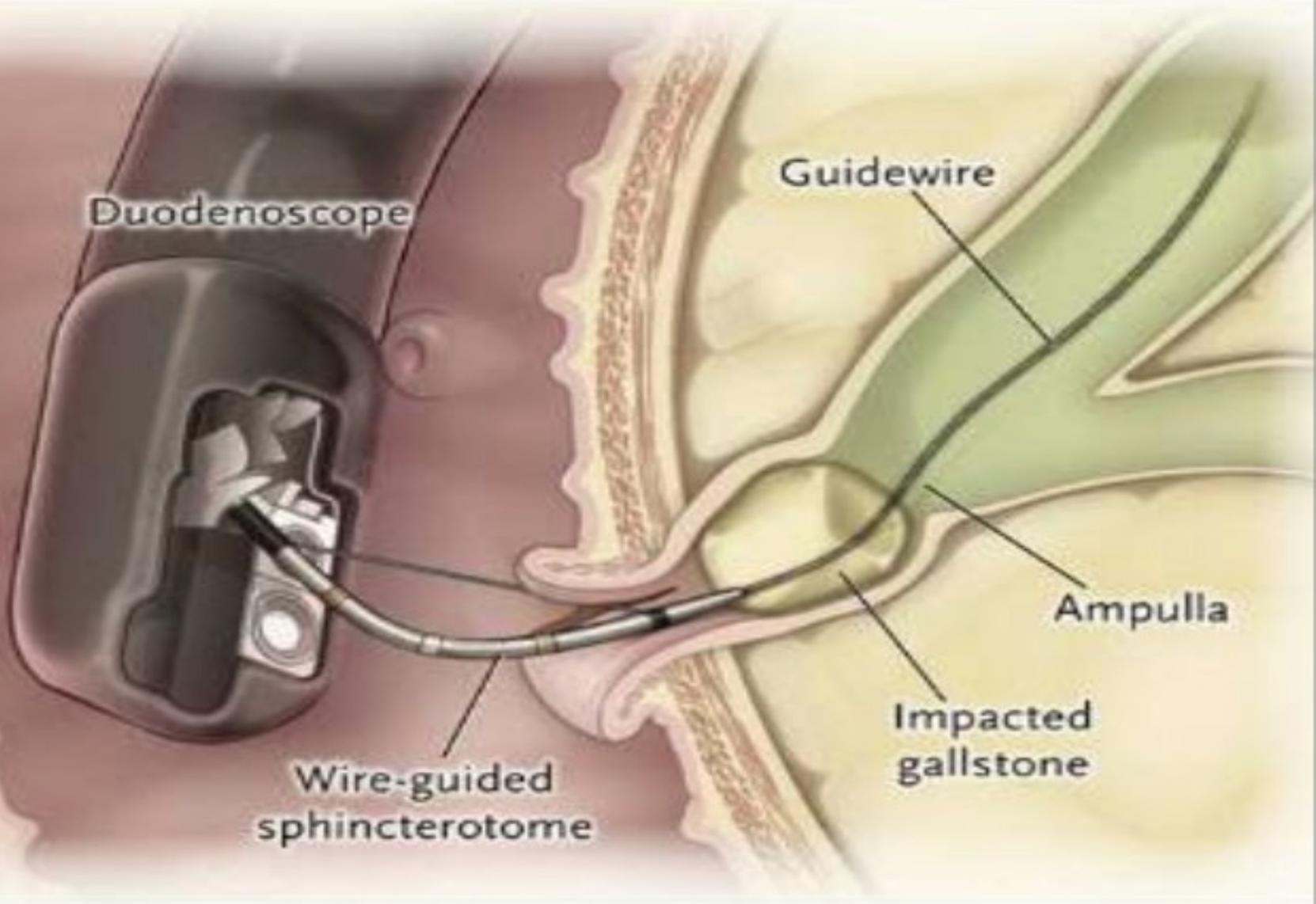


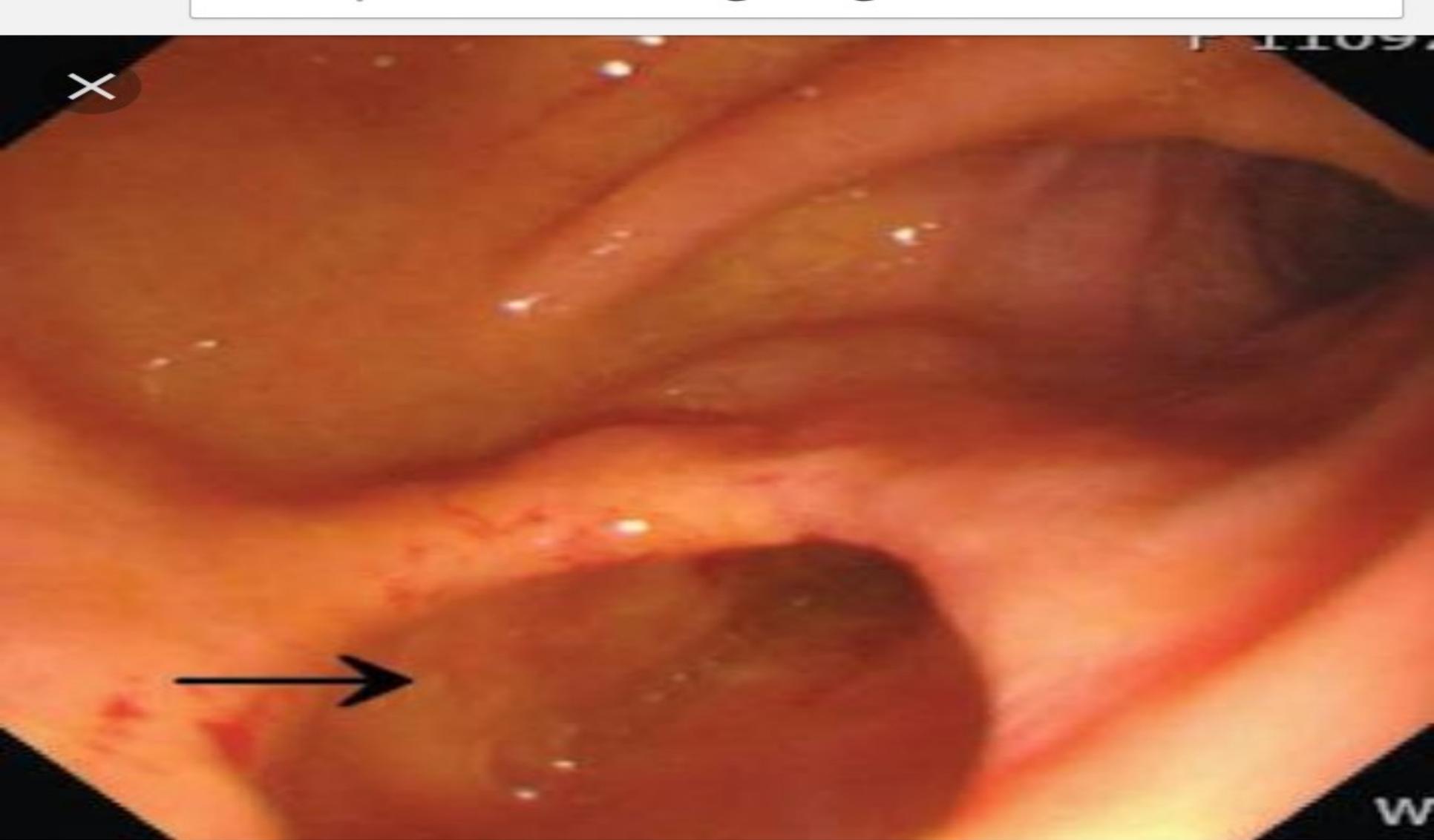






**B**

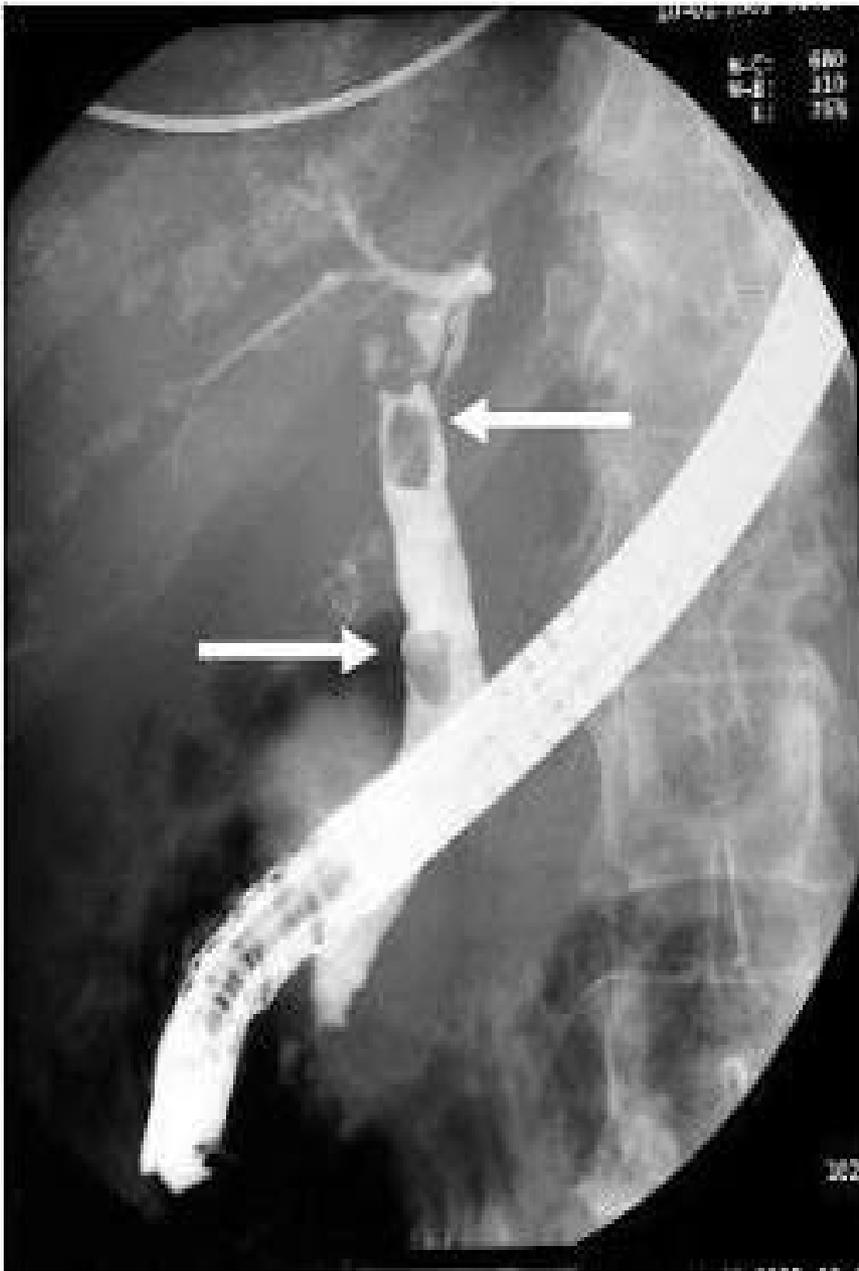


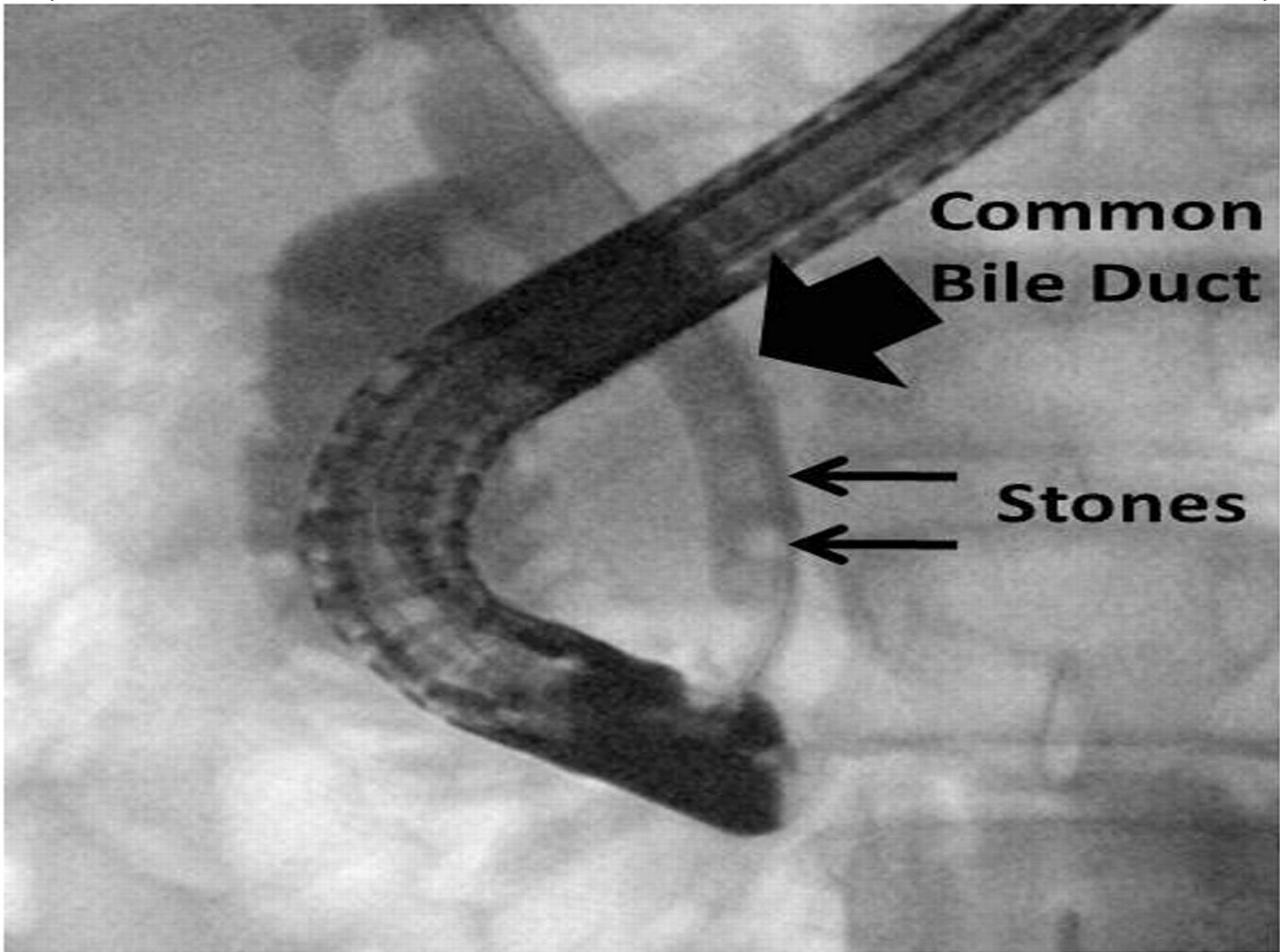


ResearchGate

ERCP showing the wide and straight opening of a ...

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**Common  
Bile Duct**

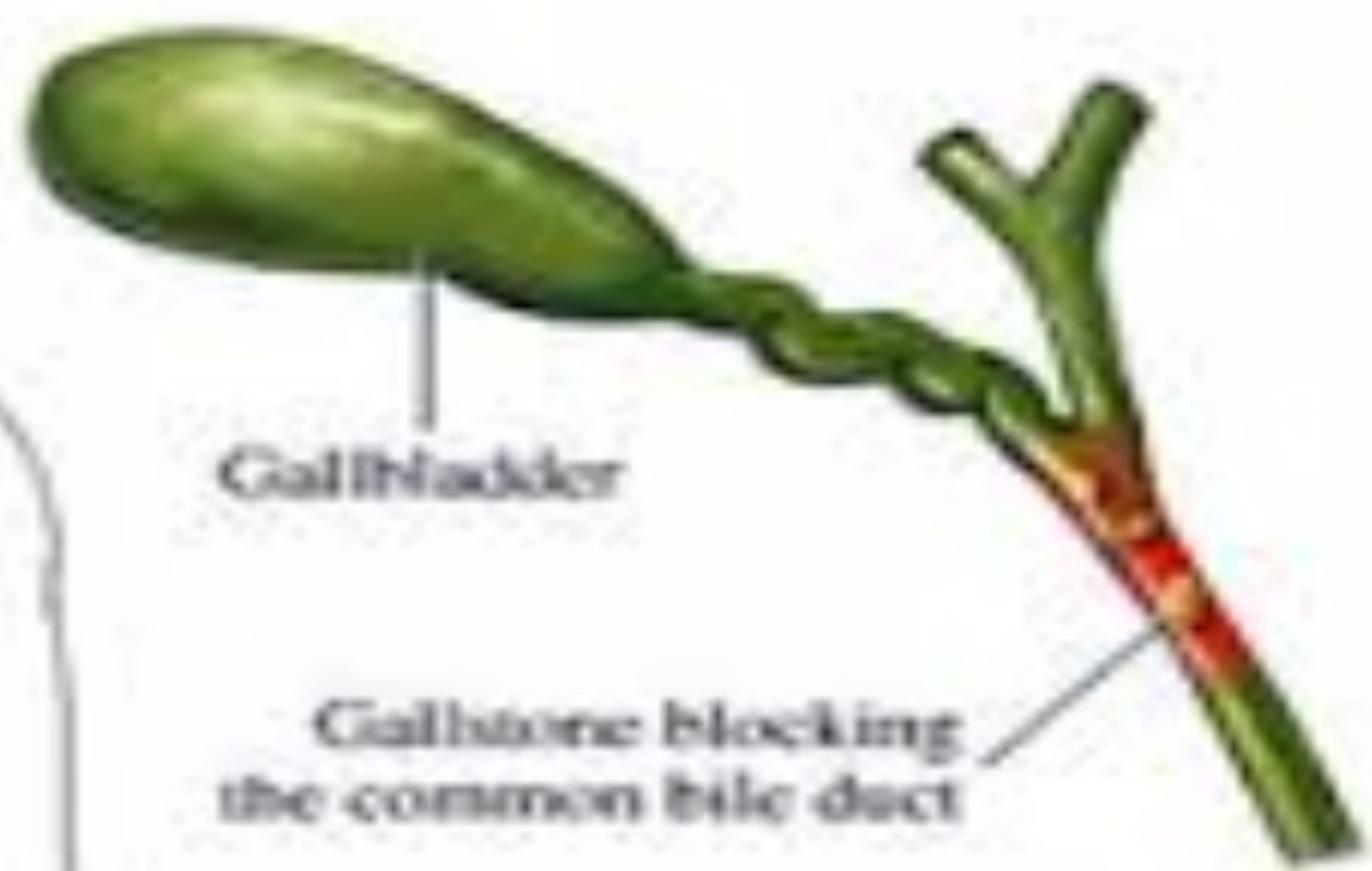
**Stones**

# ERCP Procedure

- ERCP is a procedure that one to examine the pancreatic and bile ducts.
- A bendable, lighted tube (endoscope) about the thickness of index finger is placed through the mouth and into stomach and first part of the small intestine (duodenum).

- In the duodenum a small opening is identified (ampulla) and a small plastic tube (cannula) is passed through the endoscope and into this opening.
- Dye (contrast material) is injected and X-rays are taken to study the ducts of the pancreas and liver.
- Diagnosis - Choledochal cyst with cholecystitis

**Choledochal cyst with  
obstructive stone, cholecystitis  
and pancreatitis**



Gallbladder

Gallstone blocking the common bile duct

# CHOLECYSTITIS



# Ascending Cholangitis

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# WHAT IS ACUTE PANCREATITIS ?

- It is a sudden inflammation of the pancreas.
- Abnormal activation of pancreatic enzymes occurs. Normal proenzymes converted to active form by cathepsin and later by trypsin also.
- Treatment includes fasting, aggressive IV fluid rehydration, medication and surgery.

# Causes of Pancreatitis



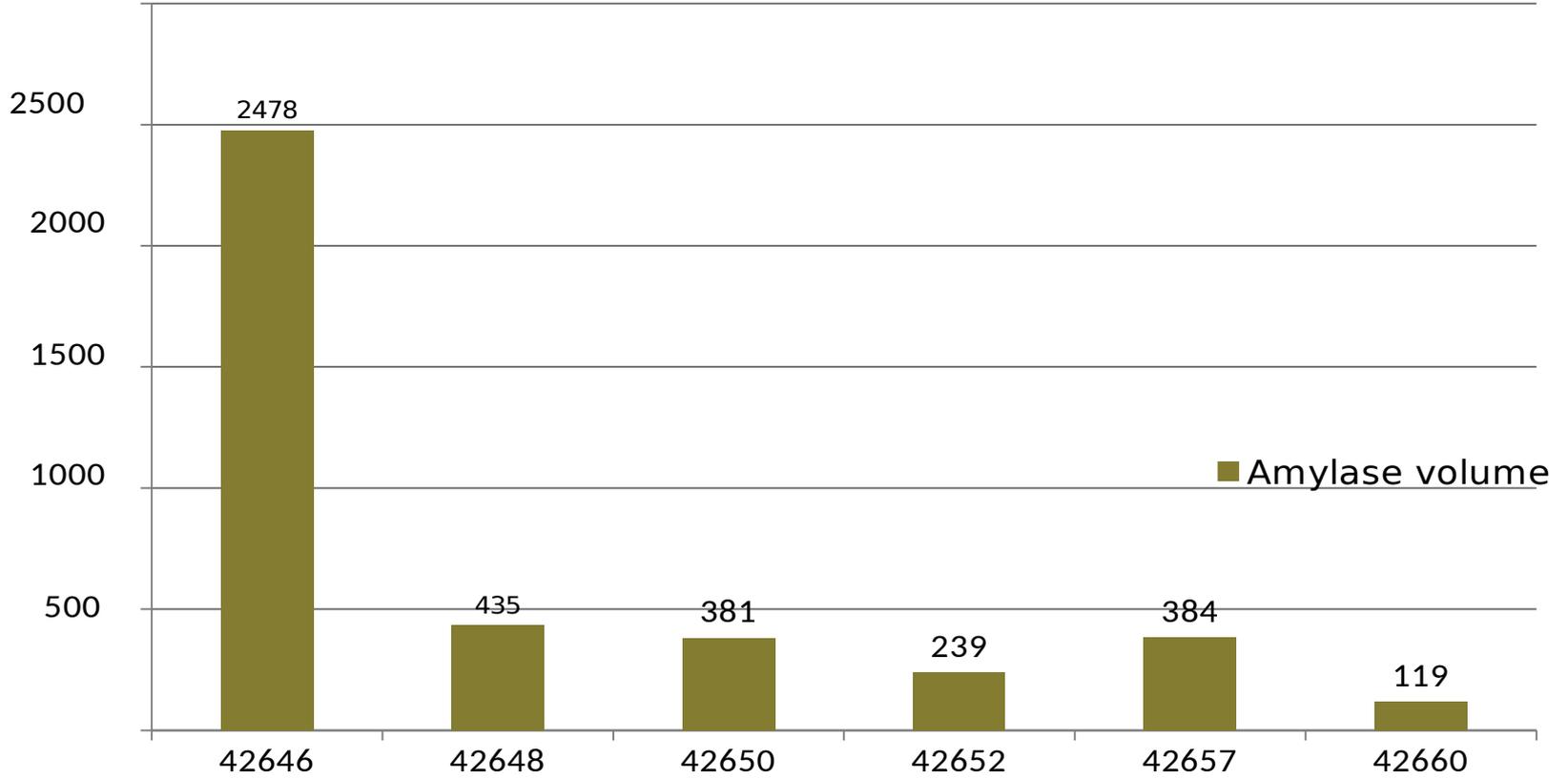
*Mnemonic: "I GET SMASHED"*

<b>I</b>	<b>IDIOPATHIC</b>	
<b>G</b>	<b>GALLSTONES</b>	2 <sup>nd</sup> most common cause in the US
<b>E</b>	<b>ETHANOL</b>	Most common cause in the US
<b>T</b>	<b>TRAUMA</b>	
<b>S</b>	<b>STERIODS</b>	
<b>M</b>	<b>MUMPS / MALIGNANCY</b>	
<b>A</b>	<b>AUTOIMMUNE</b>	May have IgG4 antibody present
<b>S</b>	<b>SCORPION STING</b>	
<b>H</b>	<b>HYPERTRIGLYCERIDES OR HYPERCALCEMIA</b>	Usually TG >1000
<b>E</b>	<b>ERCP</b>	
<b>D</b>	<b>DRUGS</b> (e.g. HCTZ, Didanosine, Pentamidine, Bactrim, Azathioprine)	

# AMYLASE GRAPH

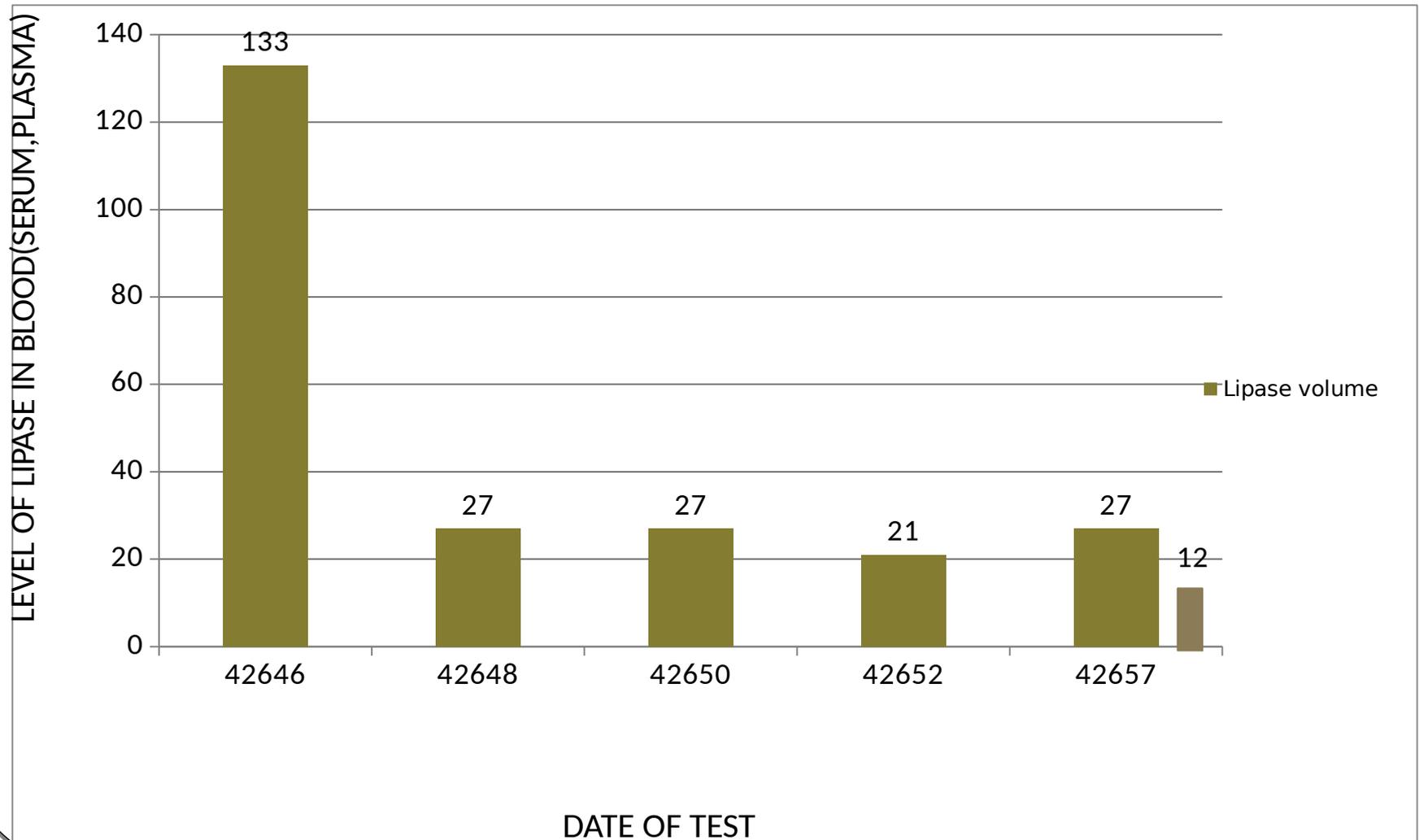
IN U/L

LEVEL OF AMYLASE IN BLOOD (SERUM, PLASMA)



DATE OF TEST

# LIPASE GRAPH



# Why important lipase more than amylase?

- Reference range
  1. Amylase=28-100 U/L
  2. Lipase=0-5 U/L
- If amylase levels more than five times normal levels and lipase levels more than two times normal levels indicated acute pancreatitis so lipase is indicated earlier more than amylase.
- Lipase is produced by the pancreas, liver, small intestine, tongue, stomach and many other cells.

# CONSERVATIVE TREATMENT

- To prevent release of bile and pancreatic enzymes the patient was kept Nil By Mouth(NBM).
- IV Fluids - DNS,RL fluids
- Total Parenteral Nutrition(TPN)
- Antibiotics, Antihypertensive, Painkiller, Vomiting Medication
- Pantoprazole
- Vitamin K injections

# ANTIBIOTICS

- Antibiotics (OFLOX-Ofloxacin, METRO-Metronidazole)



# PAINKILLER

- Painkiller(CONTRAMAL-Tramadol)

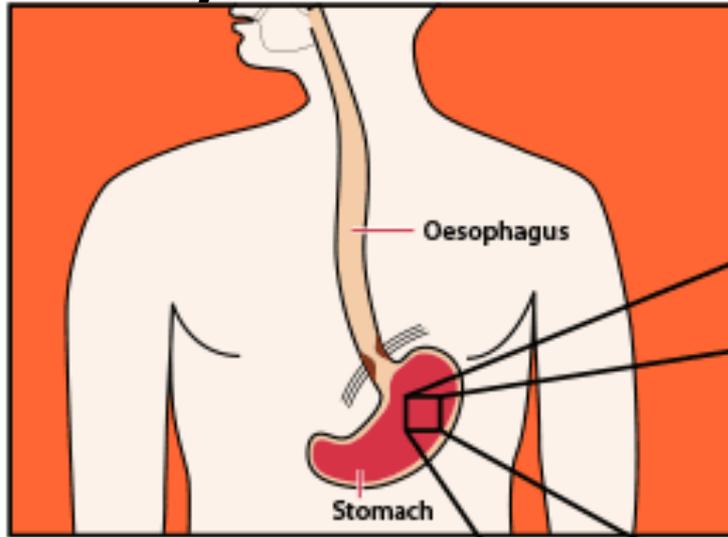


# WHAT IS PANTOPRAZOLE?

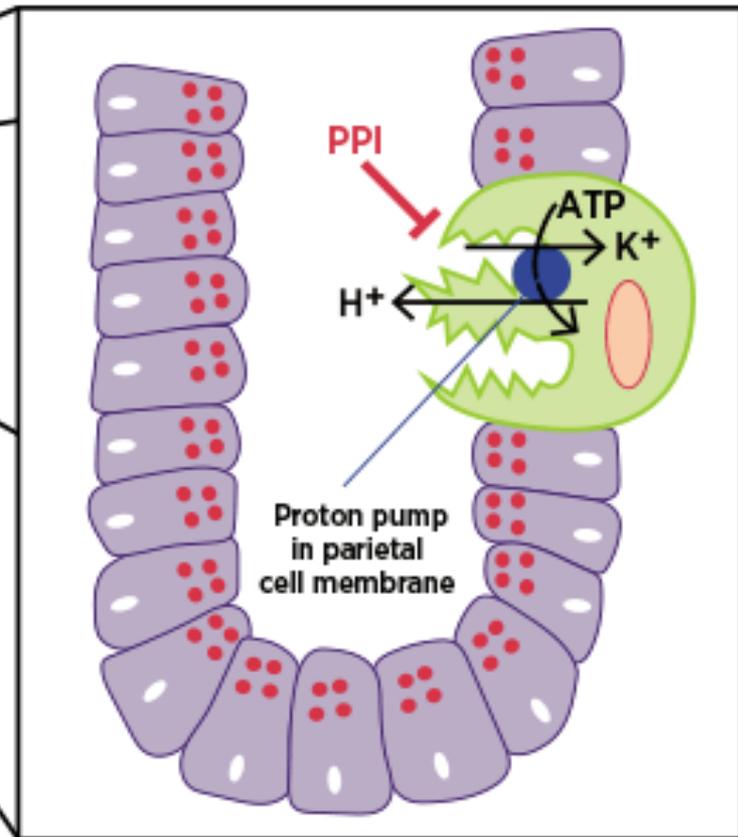
- Pantoprazole is a proton pump inhibitor drug that inhibits gastric acid secretion.
- It works on gastric parietal cells to irreversibly inhibit  $H^+/K^+$ -ATPase function and suppress the production of gastric acid.



# H<sup>+</sup>/K<sup>+</sup>-ATPase pump



Gastric pit in stomach lining



# USE OF PANTOPRAZOLE

- It is given to reduce gastric acid secretion as the patient is NBM so secretion of gastric acid can damage the walls of gastrointestinal tract and cause further complications as peptic ulcers, etc

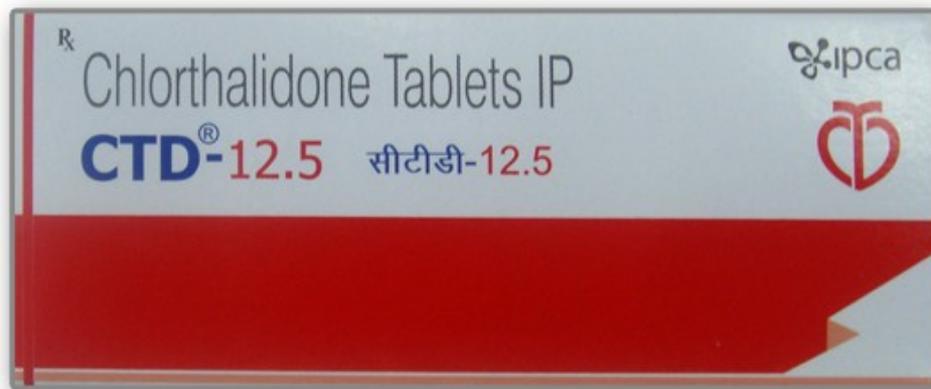
# VOMITING MEDICATION

- Vomiting Medication(EMESET-Ondansetron)



# ANTIHYPERTENSIVES

- Antihypertensives(CTD-  
Chlorthalidone, AMLO-Amlodipine)



# WHY VITAMIN K INJECTIONS ARE GIVEN?

- Intestinal bacteria produce vitamin K (fat soluble vitamin) but it's absorption requires fats in diet.
- The patient was NBM so vitamin K couldn't be absorbed and patient was to undergo surgery .
- Clotting of blood requires this vitamin thus injections were given to the patient



# DNS IV FLUID

- DNS - Dextrose and Sodium Chloride Solution. This medication is an intravenous (IV) solution used to supply water, calories, and electrolytes (e.g., sodium, chloride) to the body.



# RL IV FLUID

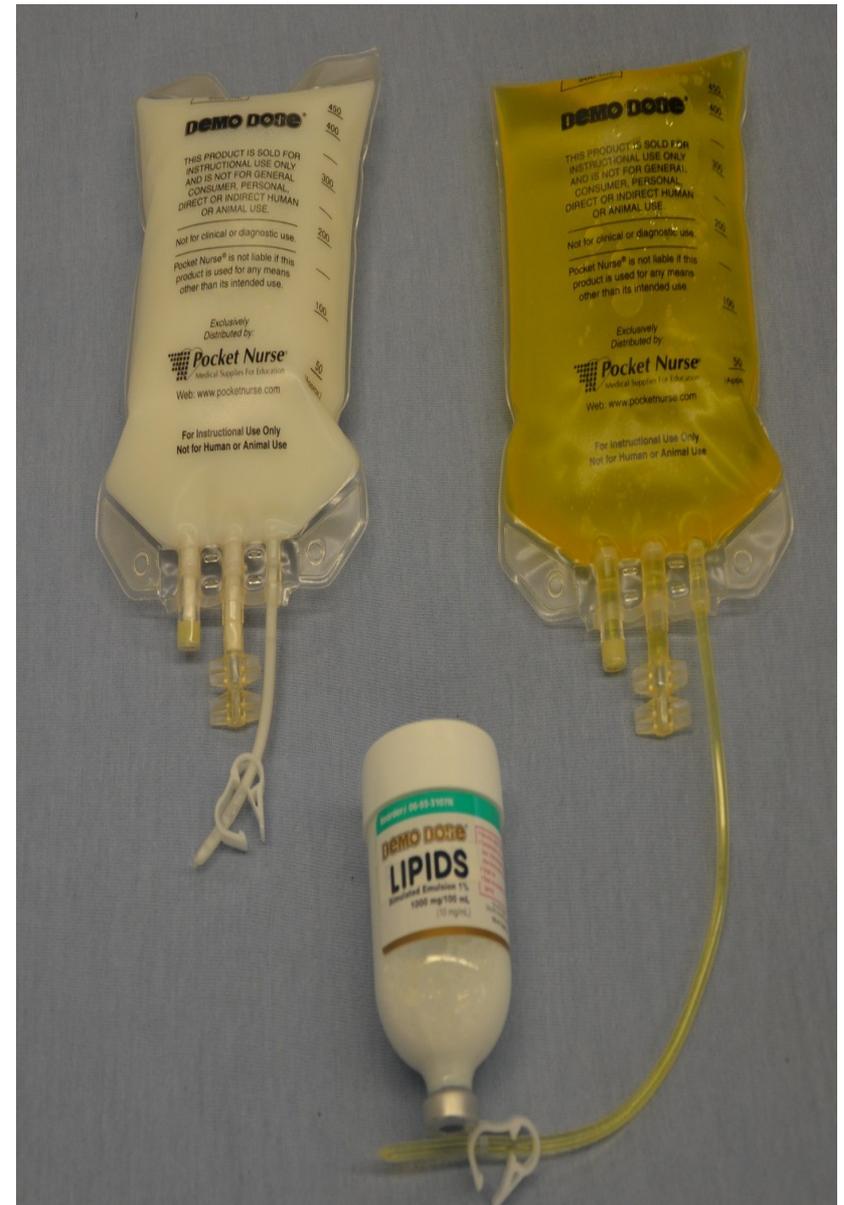
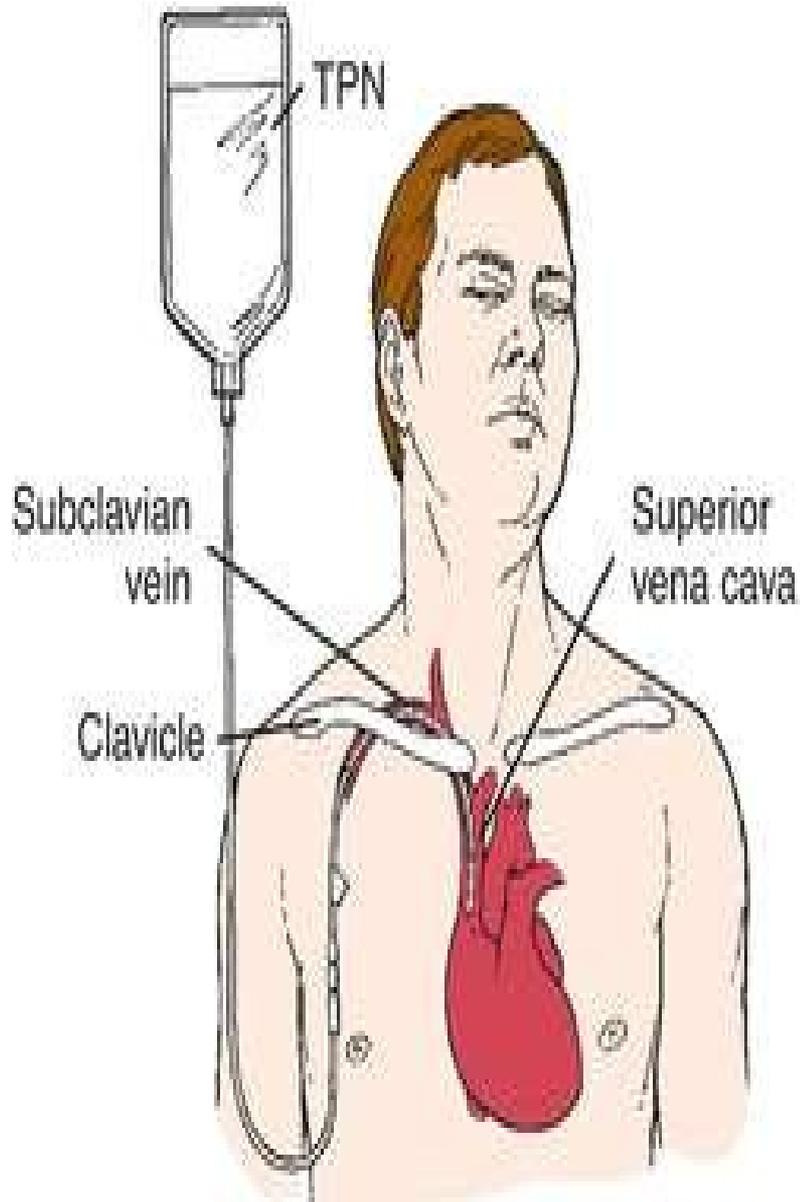
- RL - Ringer's lactate solution, also known as Ringer-Locke's solution is an intravenous fluid that contains sodium chloride, potassium chloride and sodium lactate.



# TOTAL PARENTERAL NUTRITION

- Total parenteral nutrition (TPN) is a method of feeding that bypasses the gastrointestinal tract.
- Fluids are given into a large vein to provide most of the nutrients the body needs.
- A large vein is selected as the lipids are large molecules and can cause obstruction in small veins.

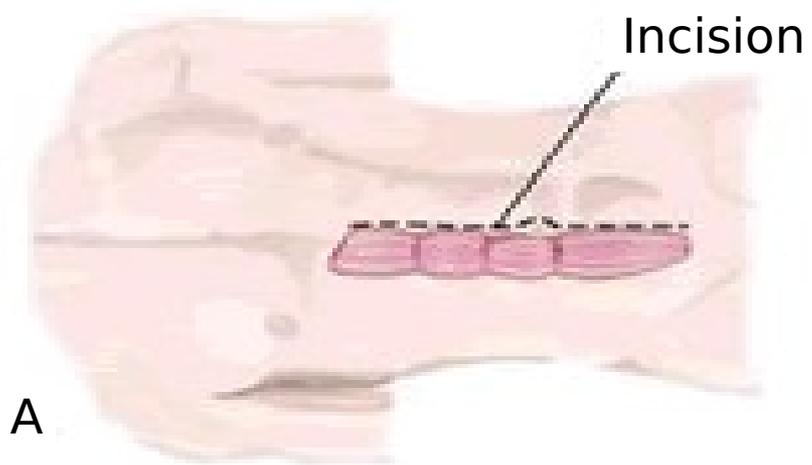
- The method is used when a person cannot or should not receive feedings or fluids by mouth.
- Prepared solutions generally consist of water and electrolytes, glucose, amino acids and lipids.
- Essential vitamins, minerals and trace elements are added or given separately.



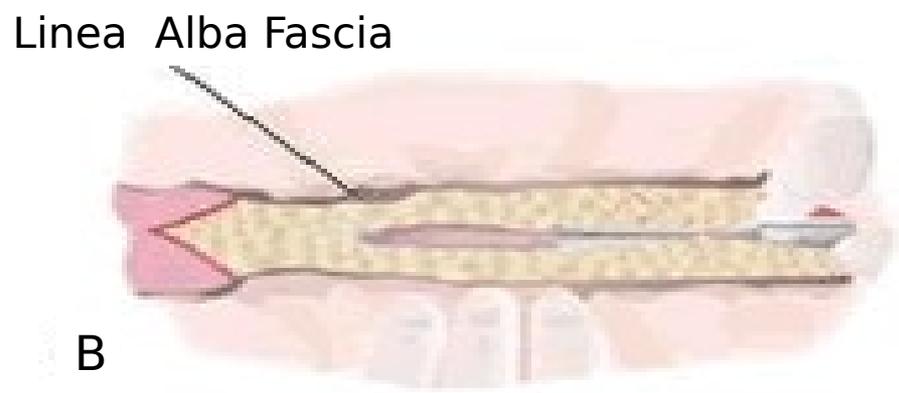
# EXPLORATORY LAPAROTOMY

- During a laparotomy an incision is made into the patient's abdomen (A).
- Skin and connective tissue called fascia is divided (B).
- The lining of the abdominal cavity, the peritoneum, is cut, and any exploratory procedures are undertaken (C).
- To close the incision, the peritoneum, fascia, and skin are stitched (E).

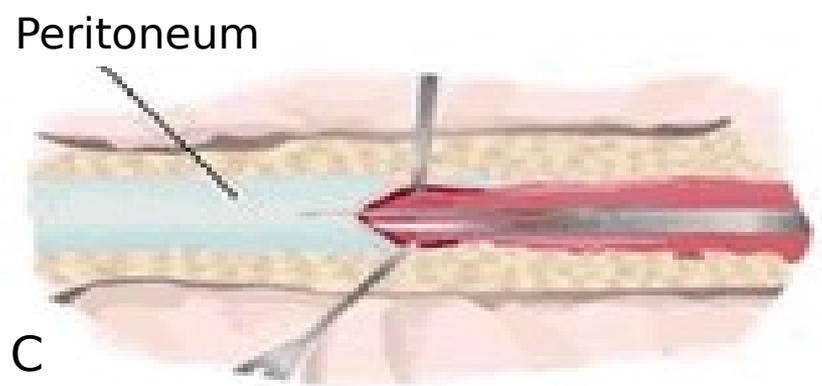
# Laparotomy



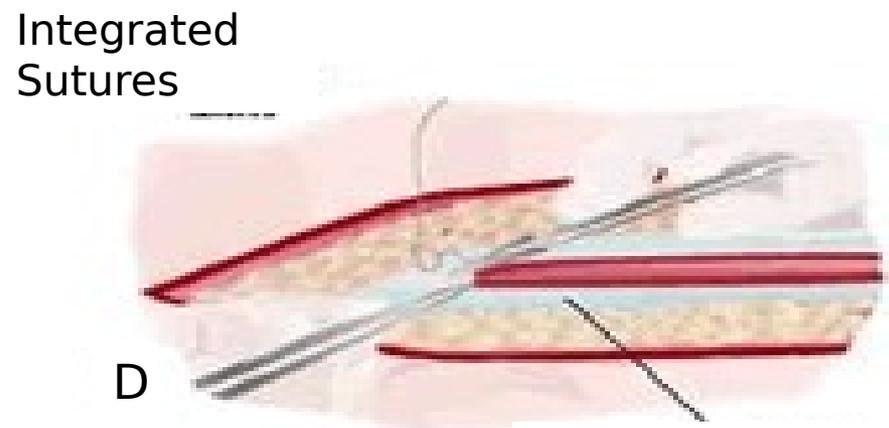
A



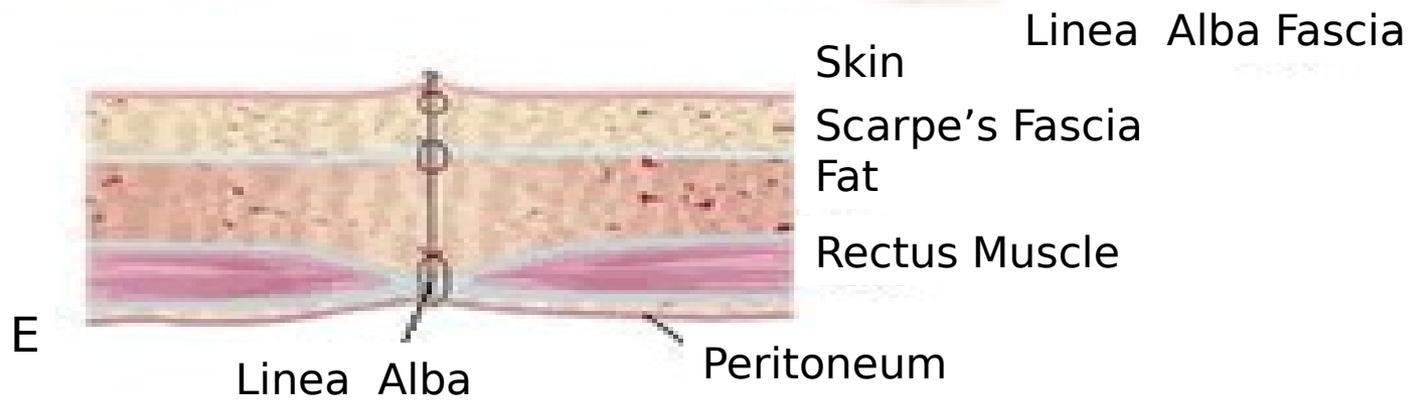
B



C



D

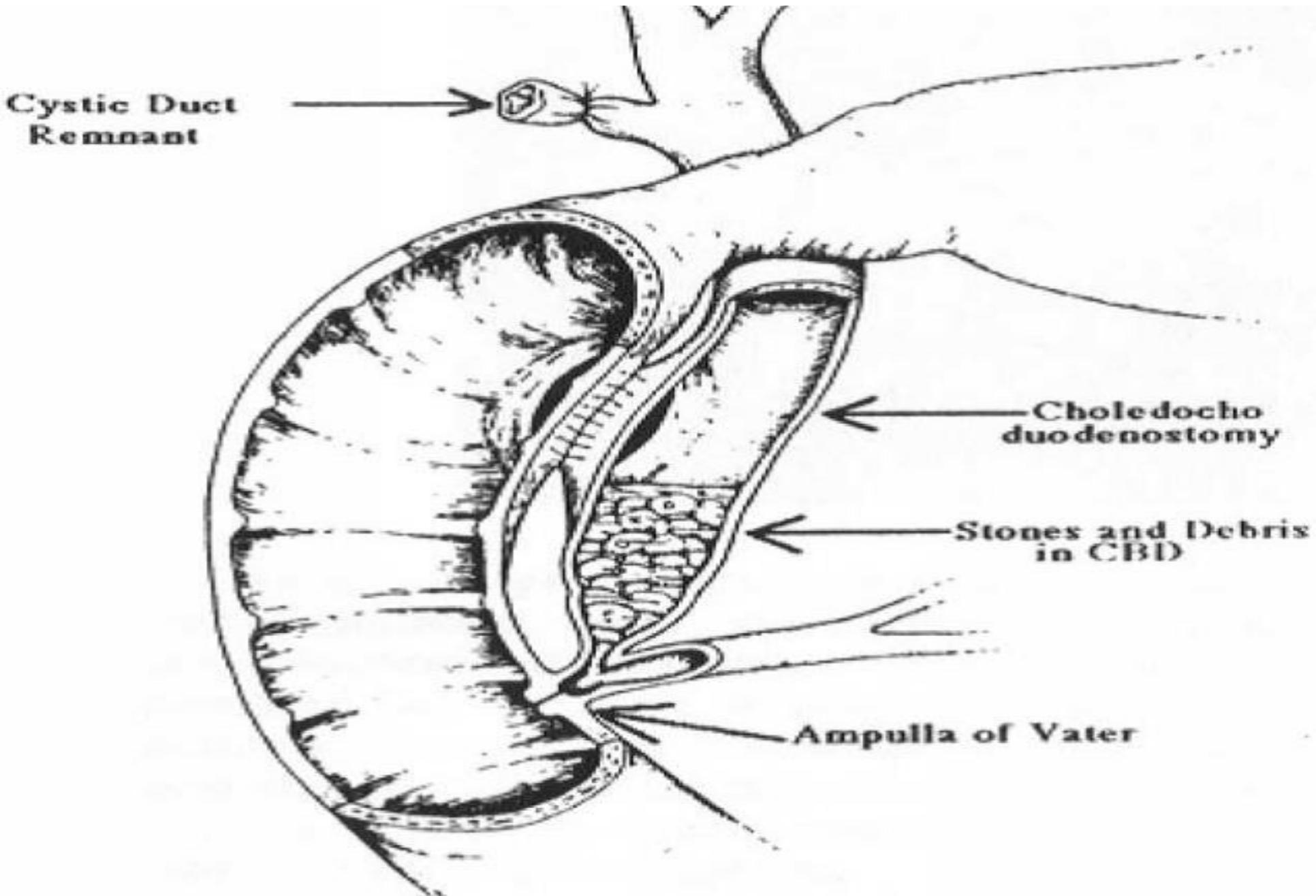


E

Linea Alba Fascia  
Skin  
Scarpe's Fascia  
Fat  
Rectus Muscle

Linea Alba Peritoneum

# CHOLEDOCHODUODENOSTOMY



- It is a simple surgical side to side anastomosis of common bile duct with duodenum.(This operation was conducted on 15/10/2016)
- SOS HEPATICOJEJUNOSTOMY – here the bile duct is removed and the jejunum is pulled up and connected with the liver to obtain it's secretion.(the operation was not required thus was not carried out)

# CBC Test

- The White Blood Cells had reached the level of 23200 cells/cu mm in blood on 16/10/2016.
- During the healing process, neutrophils and macrophages increase in number.
- They remove body cells that were damaged or died in the surgery, as well

as to prevent infection. They also dissolve the sutures. Other white blood cells are also present.

- As scar tissue completes formation and the normal cellular matrix is re-established, the elevated WBC count goes back to normal.

# Effect on Lipid, Protein and Carbohydrate Digestion and Absorption

# Lipid Digestion and Absorption

- Steatorrhea – It is the medical term for fat in stool. Fat is present as digestive tract was unable to absorb it.
- Fat absorption is dependent upon bile (which is produced in the liver and stored in the gallbladder), pancreatic lipases (enzymes that break down fat), and normal intestine function.

- If there is any abnormality in their digestion it will not be absorbed.
- Absence of bile is often due to blockage of the biliary tract and can result in pale colored fatty stool (large fat droplets) and jaundice.
- Absence of pancreatic lipases is uncommon, but can occur as a result of a diseased pancreas, pancreatitis or cystic fibrosis. Characterized by small fat droplets in stool.

# Protein digestion and absorption

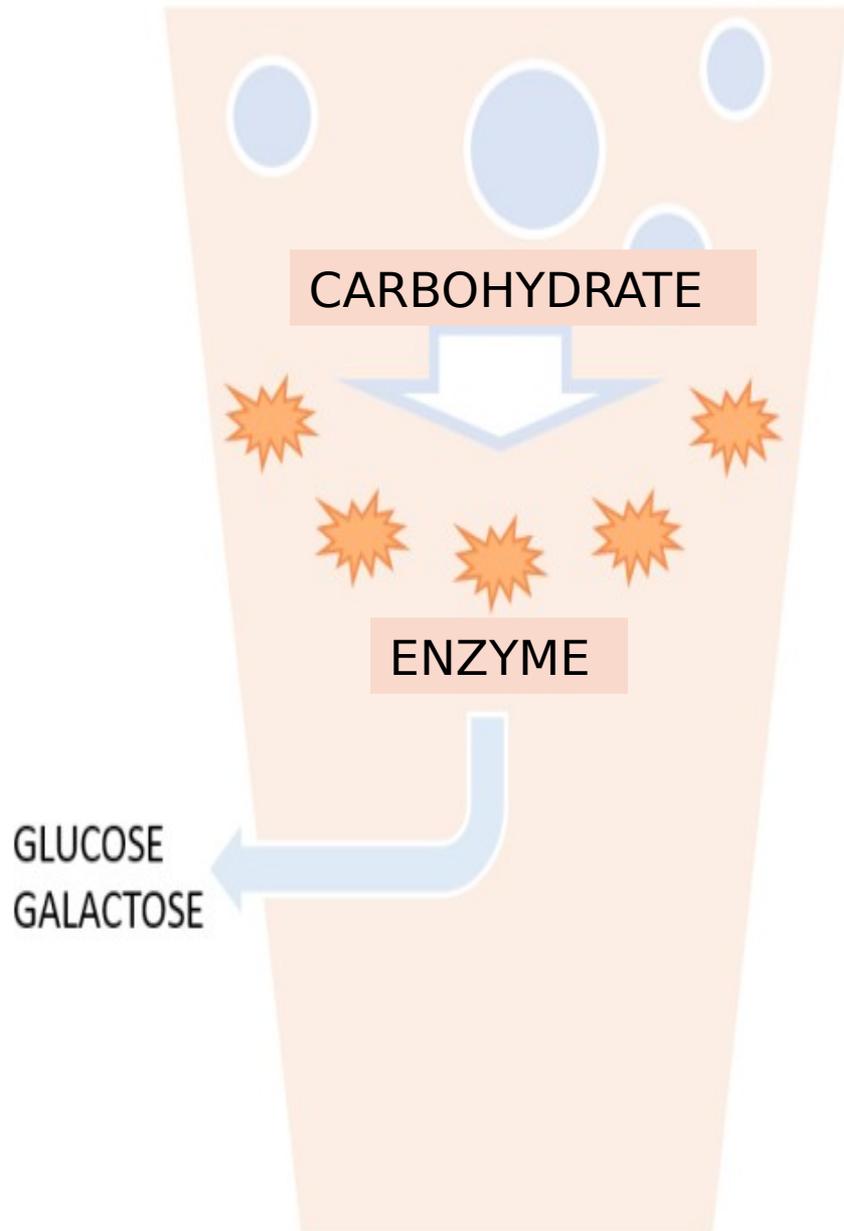
- Due to absence of trypsin, chymotrypsin and carboxypeptidase enzymes of pancreas there is incomplete digestion of proteins.

# Carbohydrate Digestion and Absorption

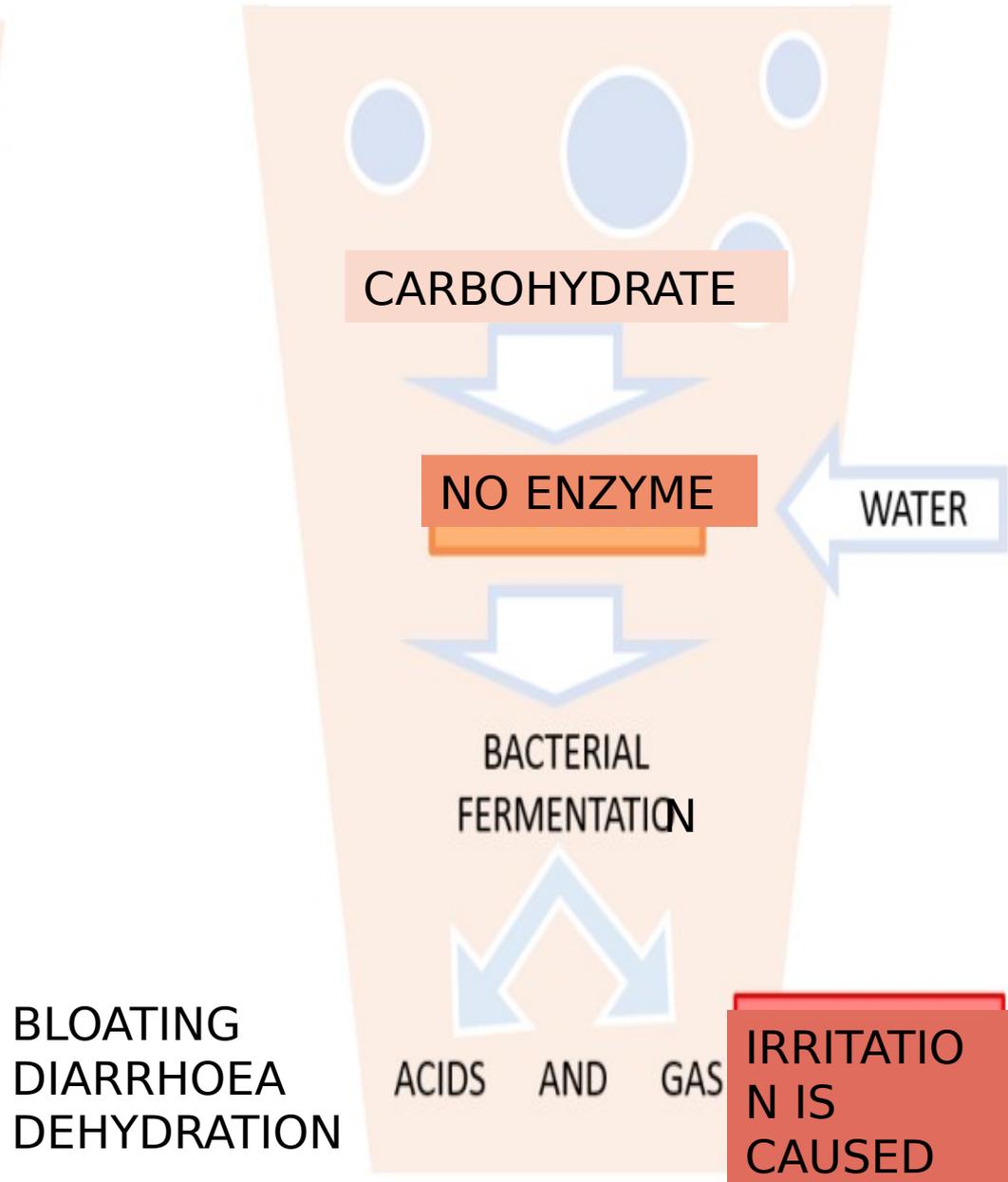
- Due to absence of amylase enzyme of pancreas there is incomplete digestion of carbohydrates.
- Causes following problems
  - Energy requirements not fulfilled
  - Intestinal cramps
  - Gas and acids released due to digestion by bacteria cause flatulence and ulcers respectively.

- Due to higher concentration of carbohydrates in intestines water moves into intestinal lumen causing swelling of abdomen.

## NORMAL CARBOHYDRATE DIGESTION



## ABSENCE OF ENZYME



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THANK YOU