



UNIVERSITY OF HAWAI'I  

---

CANCER CENTER

# Pancreas cancer - surgery

*Linda L. Wong MD*

*Professor, Associate Chairman, Dept of Surgery John A Burns Sch of Medicine  
Professor, Univ of Hawaii Cancer Center*



A Cancer Center Designated by the  
National Cancer Institute



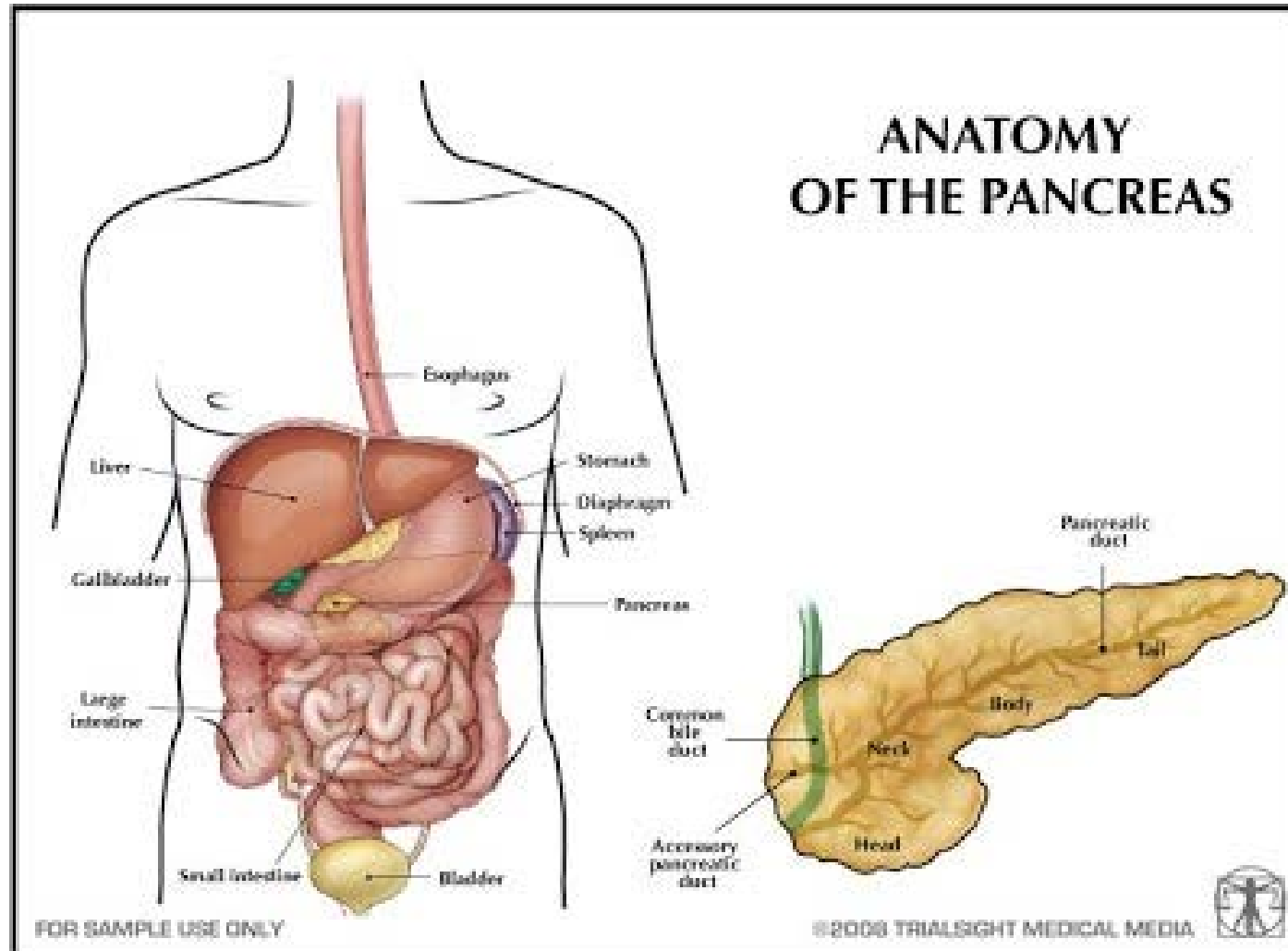
# Pancreas Cancer

---

- Pancreas anatomy
- Pancreas function
- Pancreas tumors
- Surgery of the pancreas
- Complications of pancreas surgery
- Outcome of pancreas cancer surgery

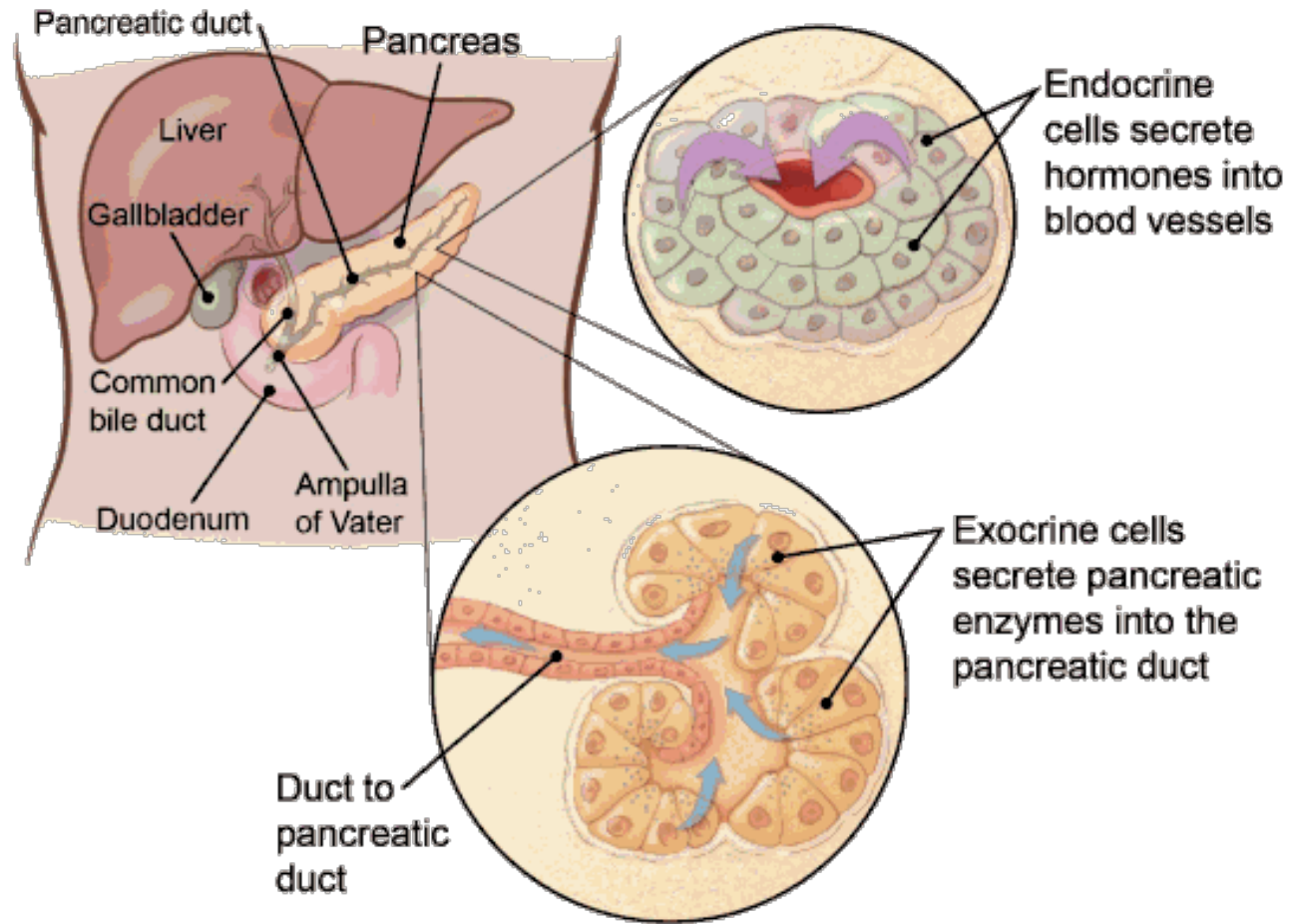


# Where is your pancreas?





# Types of cells in the pancreas





# What does your pancreas do?

---

- Functions
  - Endocrine
    - Make insulin and glucagon which help control blood sugar
    - Release these chemicals into the blood stream
  - Exocrine
    - These cells form glands which are attached to the pancreatic duct
    - Pancreas duct is attached to the duodenum (part of intestine) and merges with the bile duct
    - Enzymes are released, help digest food.



# Diseases of the pancreas

---

- Acute pancreatitis
- Chronic pancreatitis
- Pancreatic cysts
- Pancreatic tumors
  - Benign
  - **Malignant**



# Tumors of pancreas

---

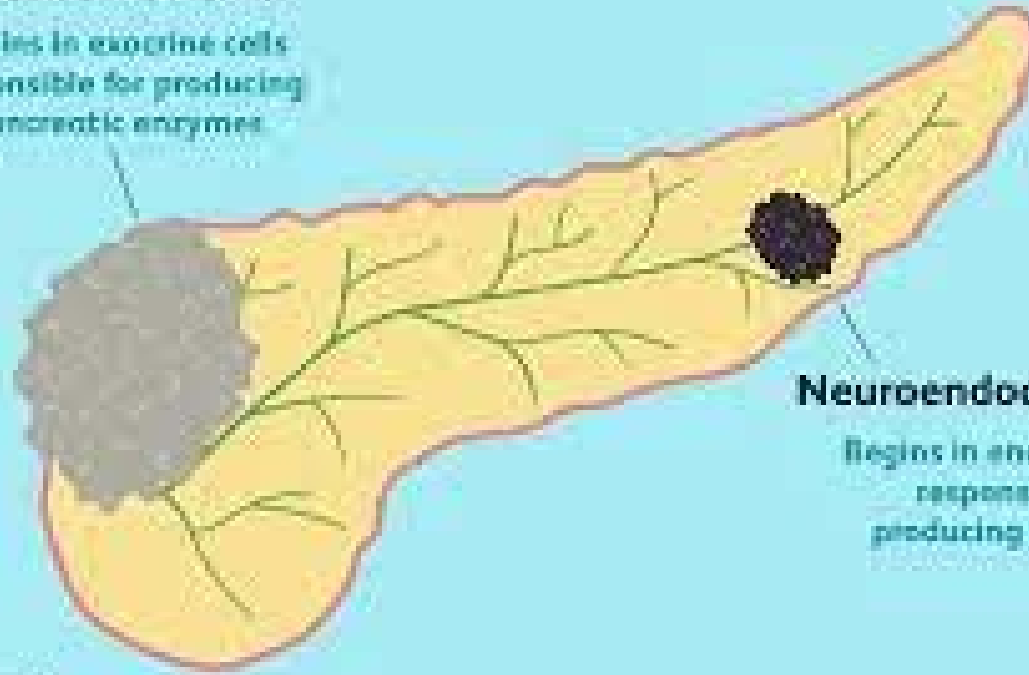
- Cystic tumors
  - Serous cystadenomas
  - Intraductal papillary mucinous neoplasms
- Neuroendocrine tumor
- Pancreas cancer



## Types of Pancreatic Cancer

### Adenocarcinoma

Begins in exocrine cells  
responsible for producing  
pancreatic enzymes



### Neuroendocrine Tumor

Begins in endocrine cells  
responsible for  
producing hormones



# Cancer surgery

---

- Potentially curative
  - Testing suggests that the cancer is localized
  - Surgery is done to remove all of the cancer
- Palliative surgery
  - Cancer has spread to other areas.
  - Surgery is done to relieve symptoms but not cure the cancer
    - Relieve intestinal blockage
    - Stop bleeding
    - Relieve bile duct blockage



# Staging laparoscopy

- Procedure done to look into abdomen with a camera
- General anesthesia is required
- Assess the extent of the tumor





# Staging laparoscopy

Can identify small lesions on the liver that were not seen on Imaging





# Staging laparoscopy

---

Can identify peritoneal implants (small tumors on the wall of the abdomen)





# Staging laparoscopy

---

- Spread of cancer outside the pancreas prevents the surgeon from curing a patient
- If tumor is found in the liver or abdominal wall, then surgeon stops curative surgery



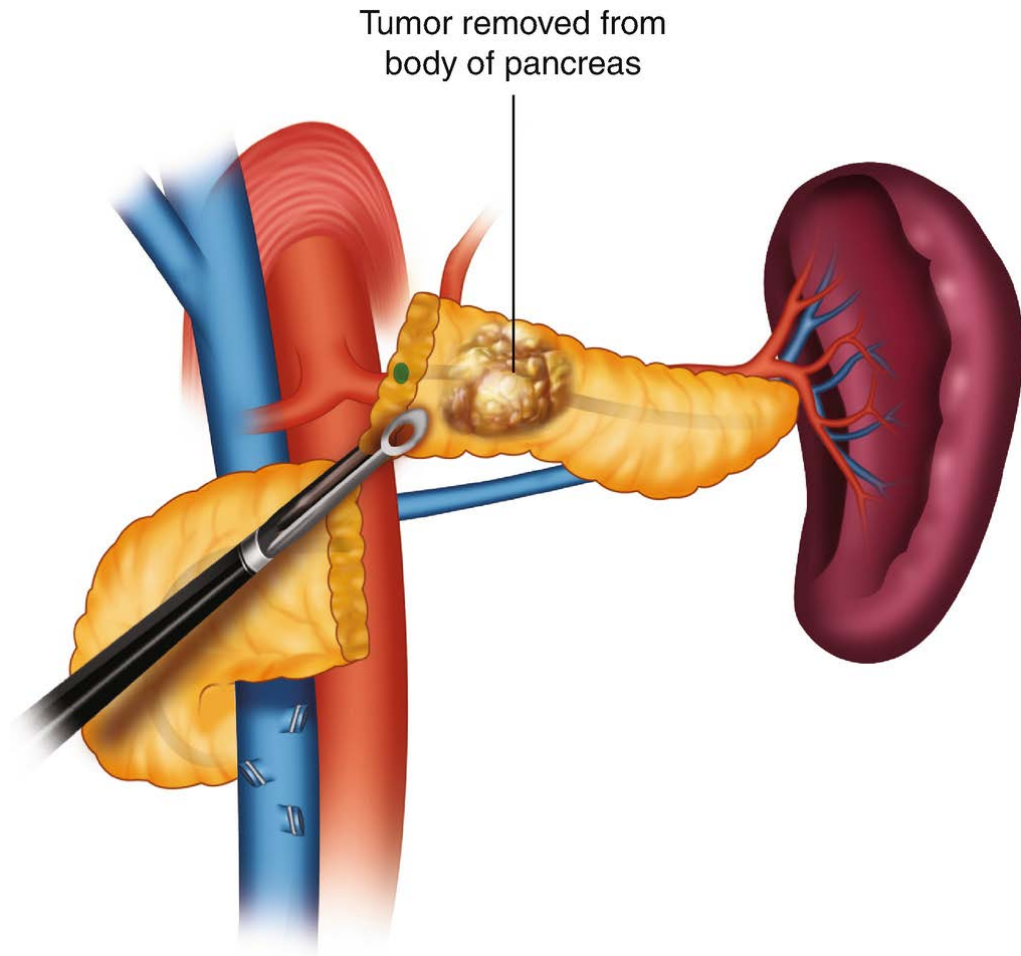
# Pancreatic resections

---

- Staging laparoscopy
- Distal pancreatectomy
  - For tumors in the body and tail of the pancreas
- Whipple
  - For tumors at the head of the pancreas
- Total pancreatectomy
  - Removing entire pancreas



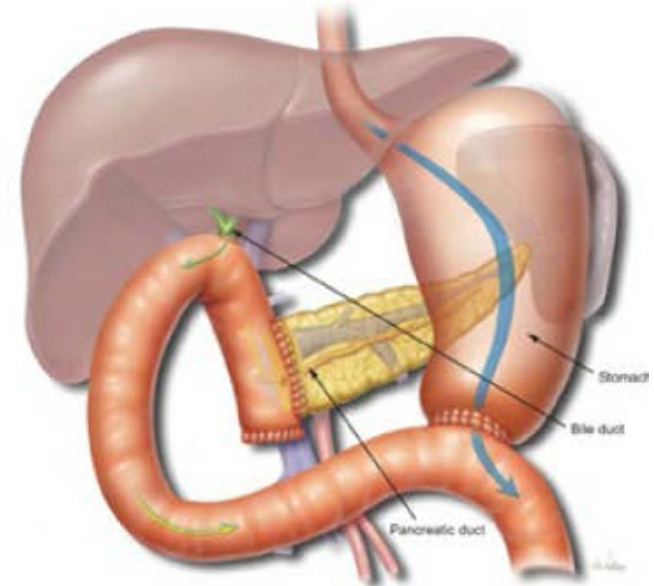
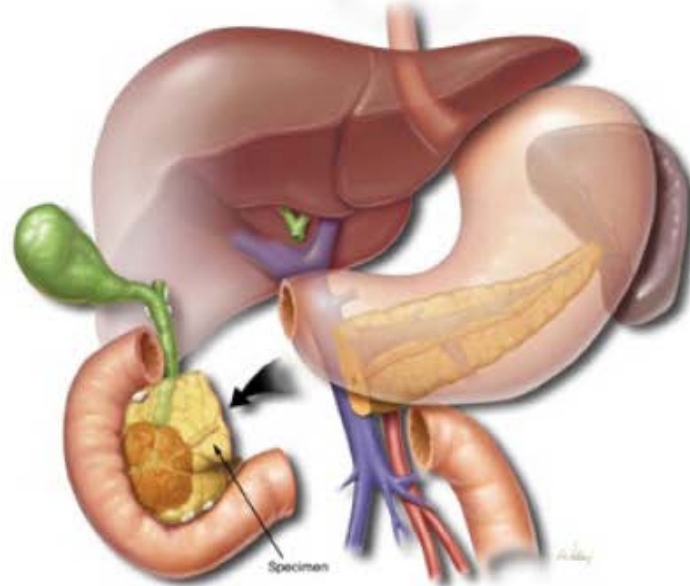
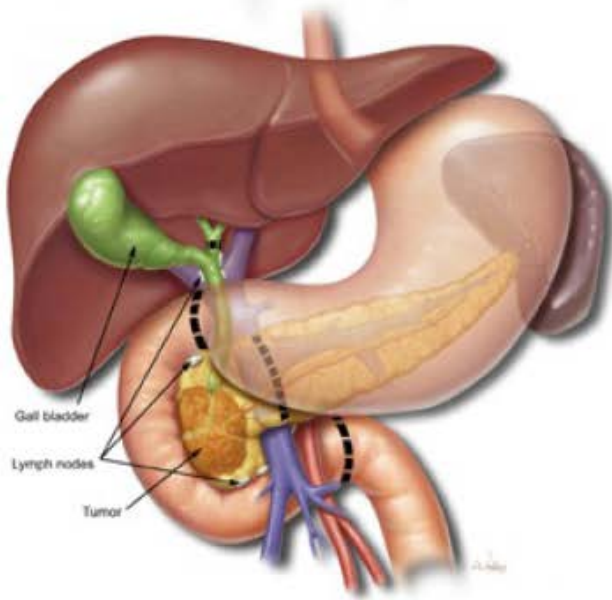
# Distal pancreatectomy



- Usual done with a splenectomy
- Spleen
  - Makes antibodies
  - Breaks down old blood cells
  - It's possible to live without your spleen

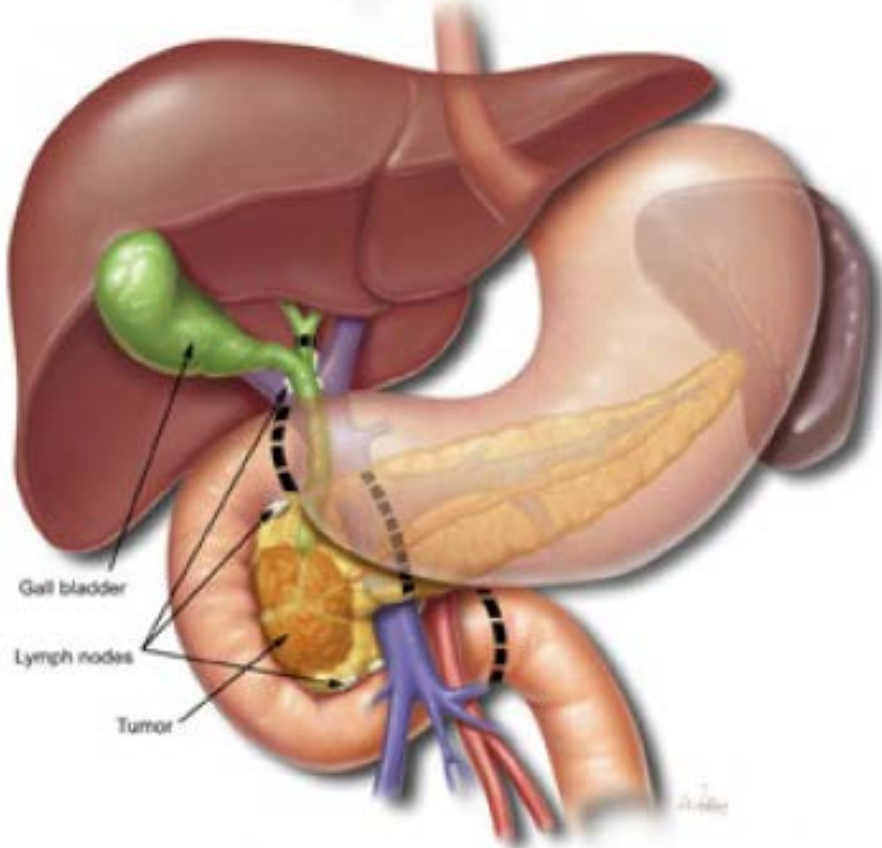


# Whipple procedure





# Whipple

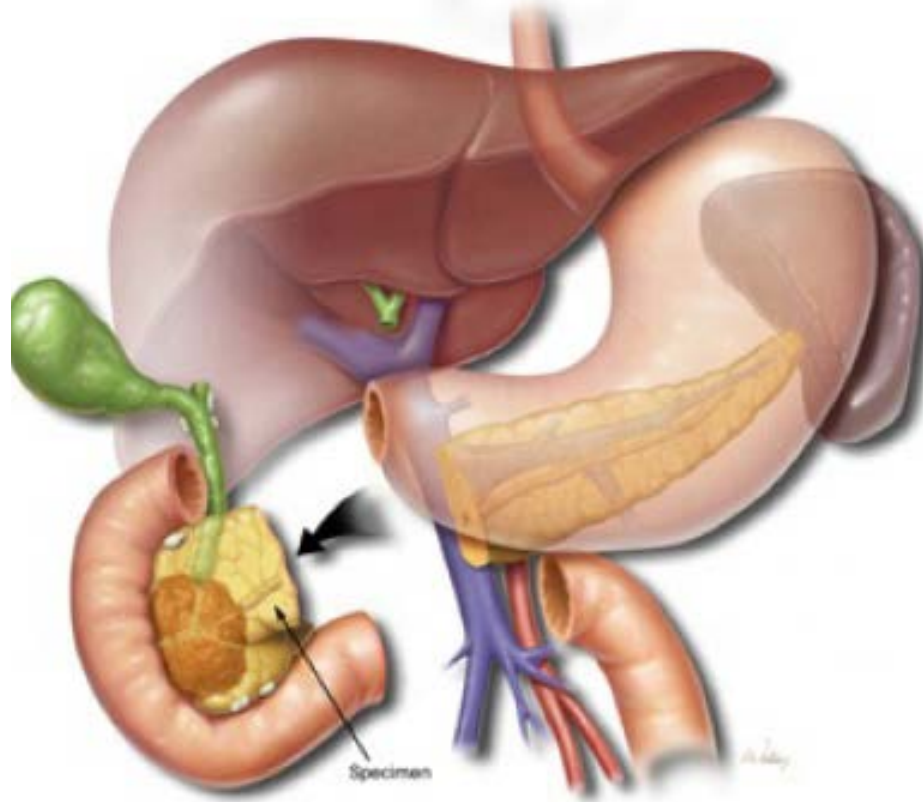


- Normal anatomy before surgery
- Tumor at the head of the pancreas



# Whipple - resection

---



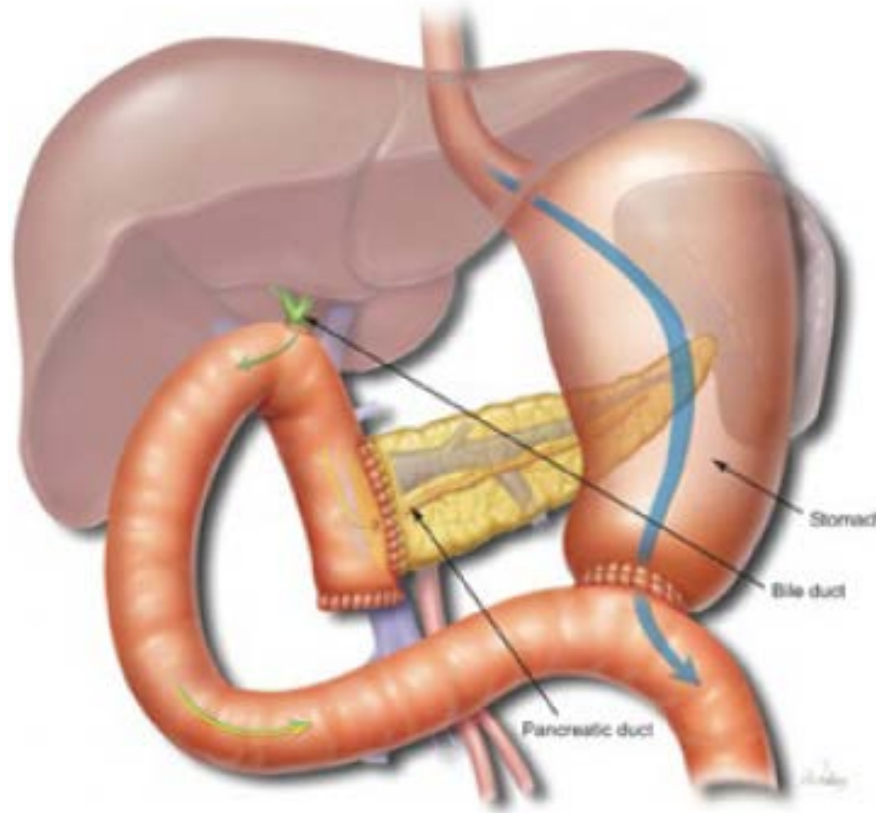
- Goals

- Remove the head of the pancreas
- Remove the blocked bile duct
- Remove part of the duodenum and stomach near pancreas
- Remove gallbladder



# Whipple - reconstruction

---



- Reconstruction
  - Connect pancreas to intestine
  - Connect bile duct to intestine
  - Connect stomach to intestine



# Palliative surgery for pancreas cancer

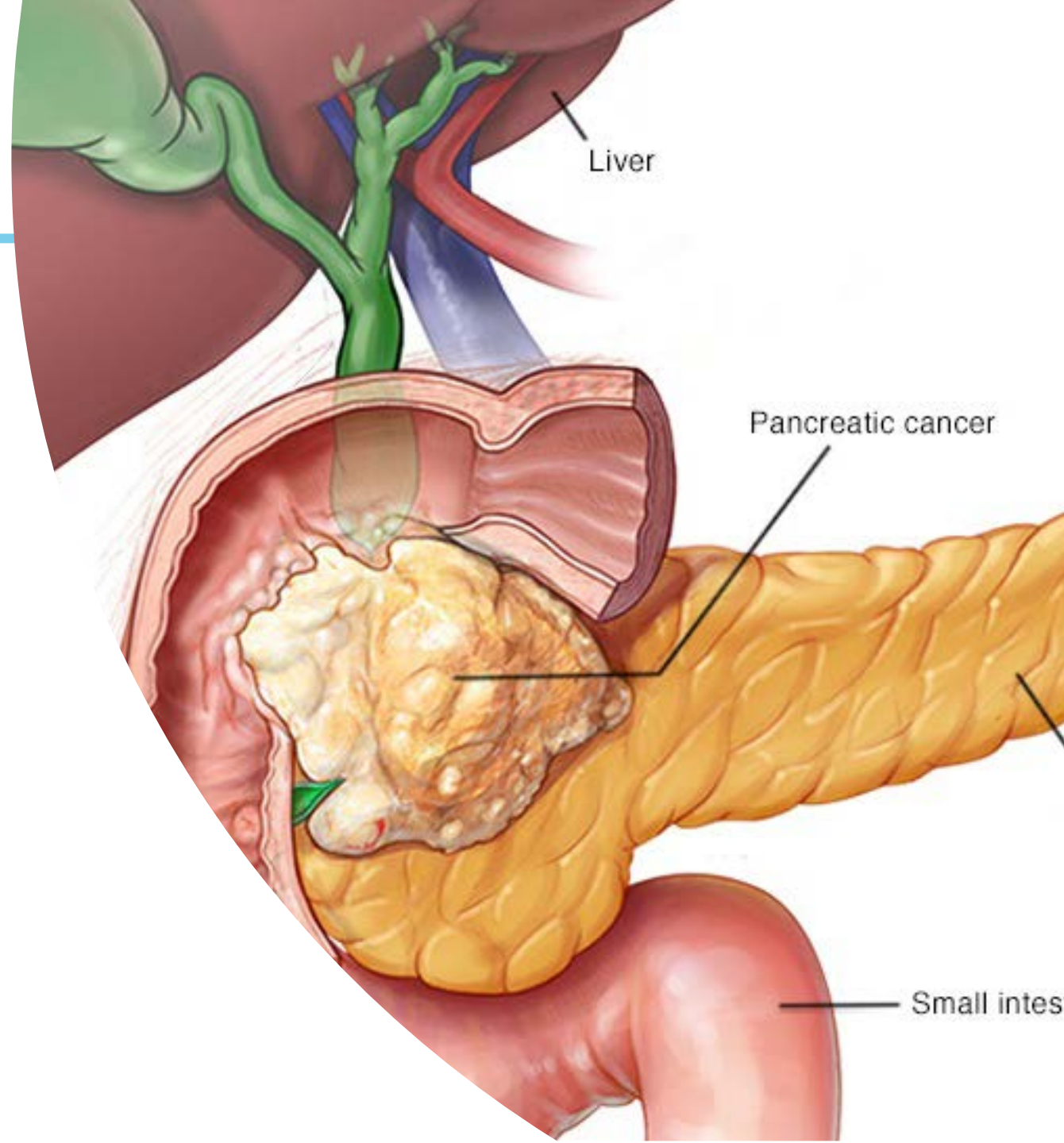
---

- Indications
  - Bile duct obstruction
  - Gastric obstruction



# Biliary obstruction

- The flow of bile from the liver normally is thru the pancreas into the intestine (duodenum)
- Pancreas cancer can block the flow of bile
- Jaundice (yellow skin, eyes, dark urine)
- Itching





# Biliary obstruction – treatment

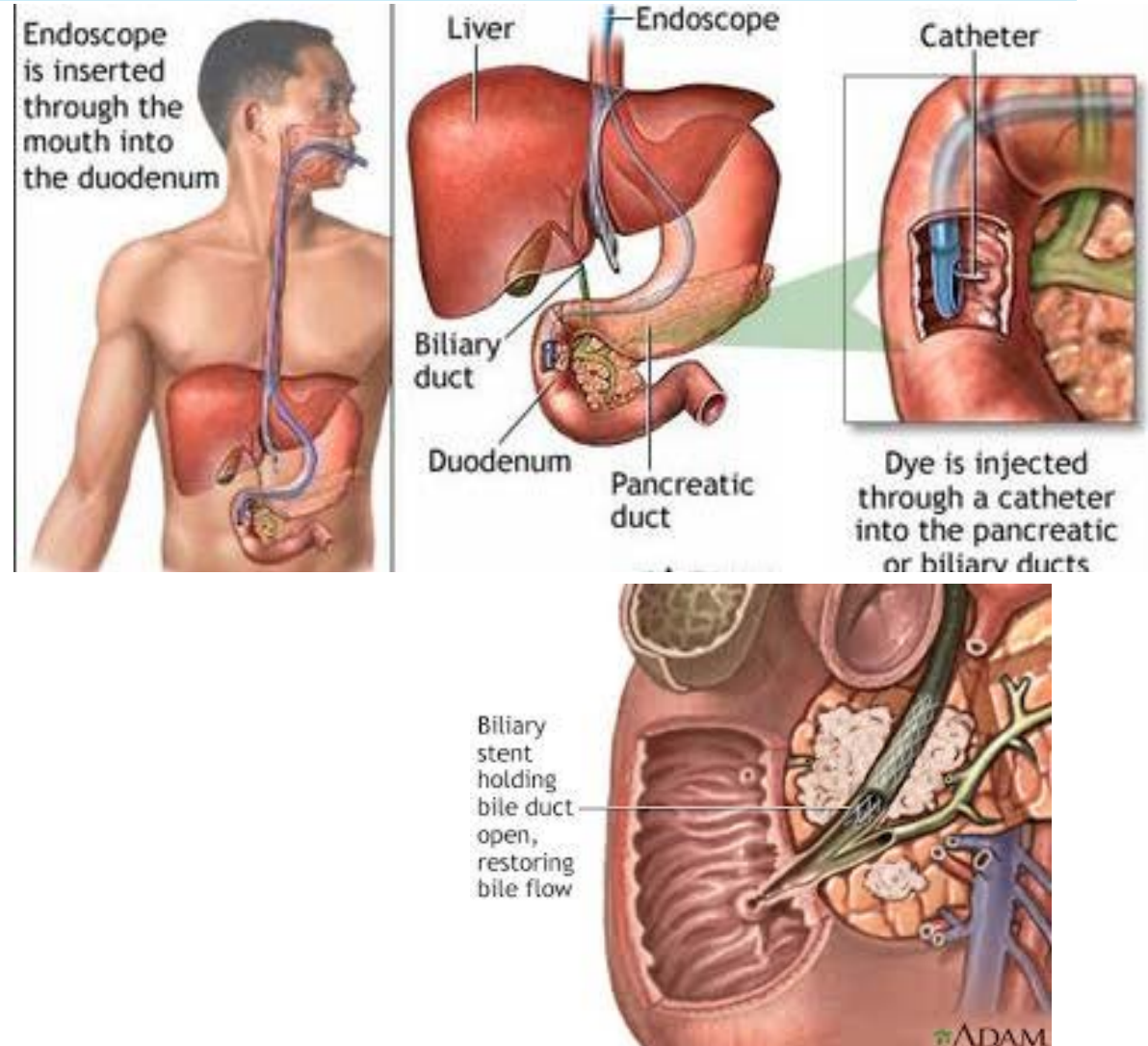
---

- Endoscopically
  - By a gastroenterologist
- Percutaneously
  - By a radiologist
- Surgically
  - By a surgeon



# Biliary obstruction – endoscopic approach

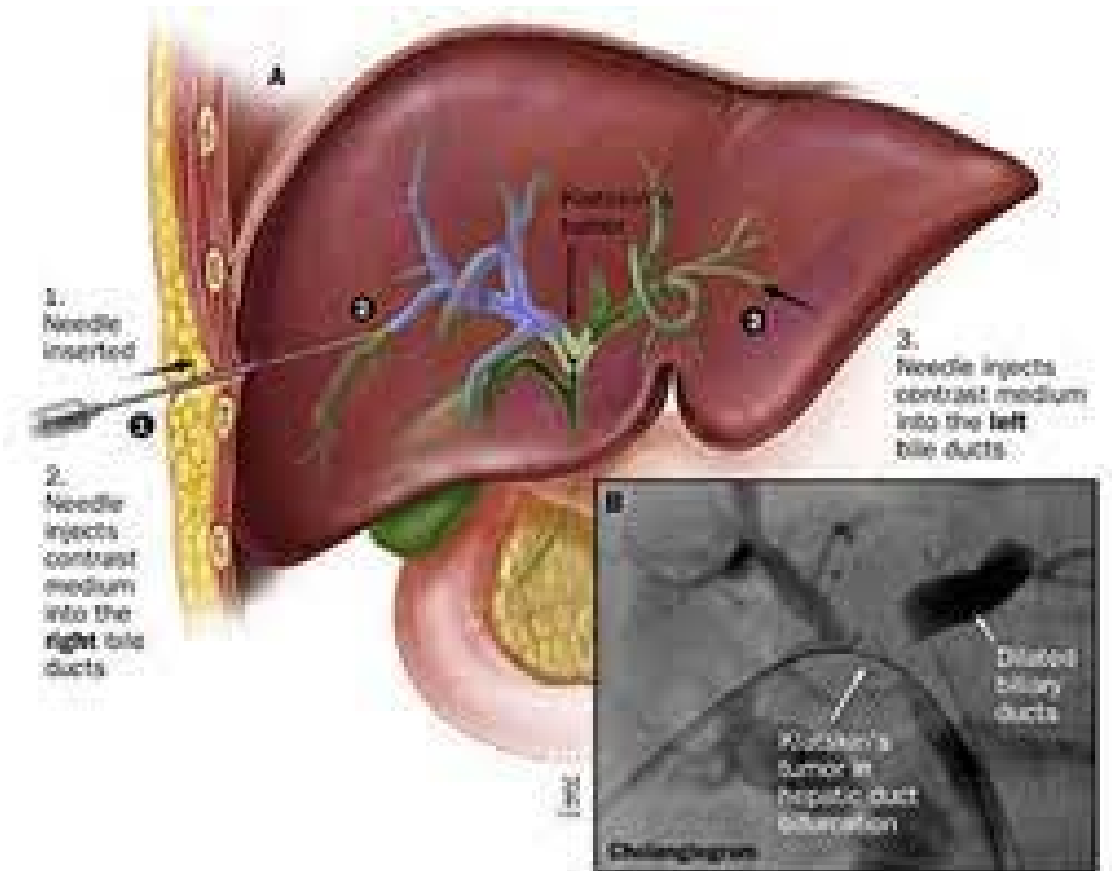
- Bile duct obstruction can be relieved with endoscopic stent placement
- Stent – plastic or metallic tube





# Biliary obstruction – radiology approach

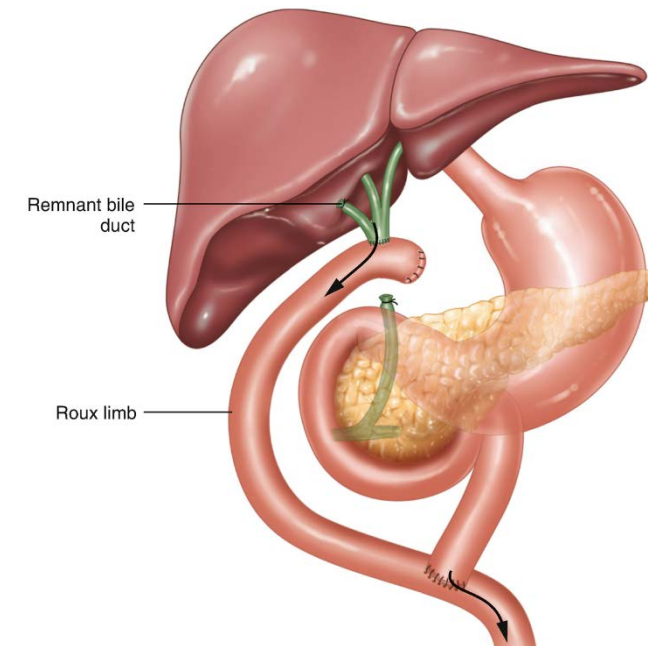
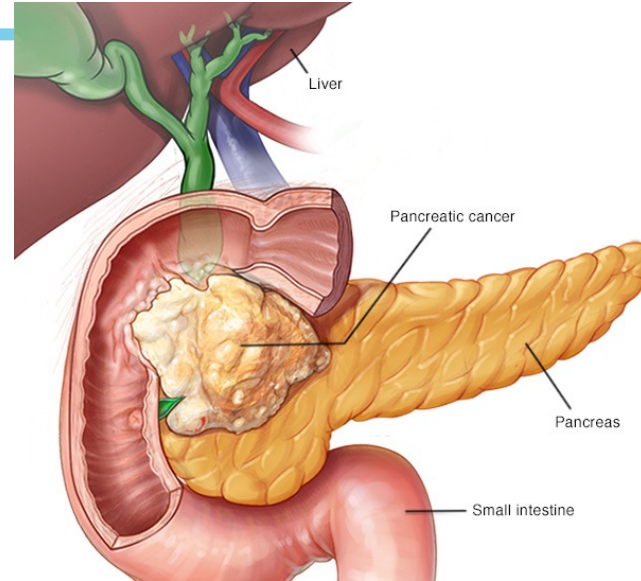
- Needle placed thru the skin directly into the liver
- Wire is passed thru a bile duct and into duodenum
- Catheter is passed over the wire.





# Biliary obstruction – surgical approach

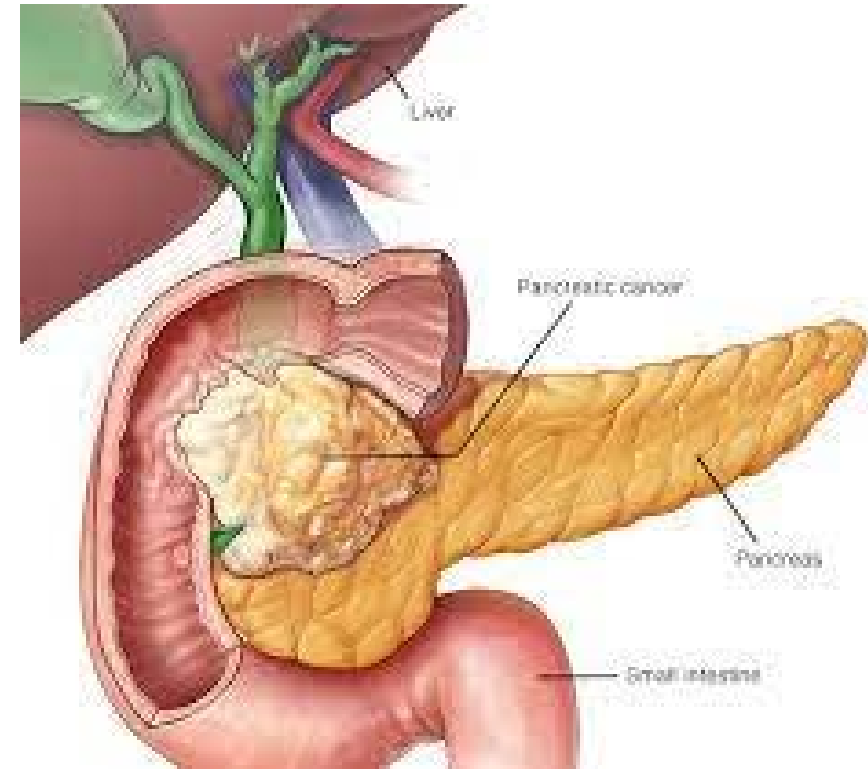
- Surgically attach the bile duct to a new piece of intestine to bypass the blockage





# Gastric outlet obstruction

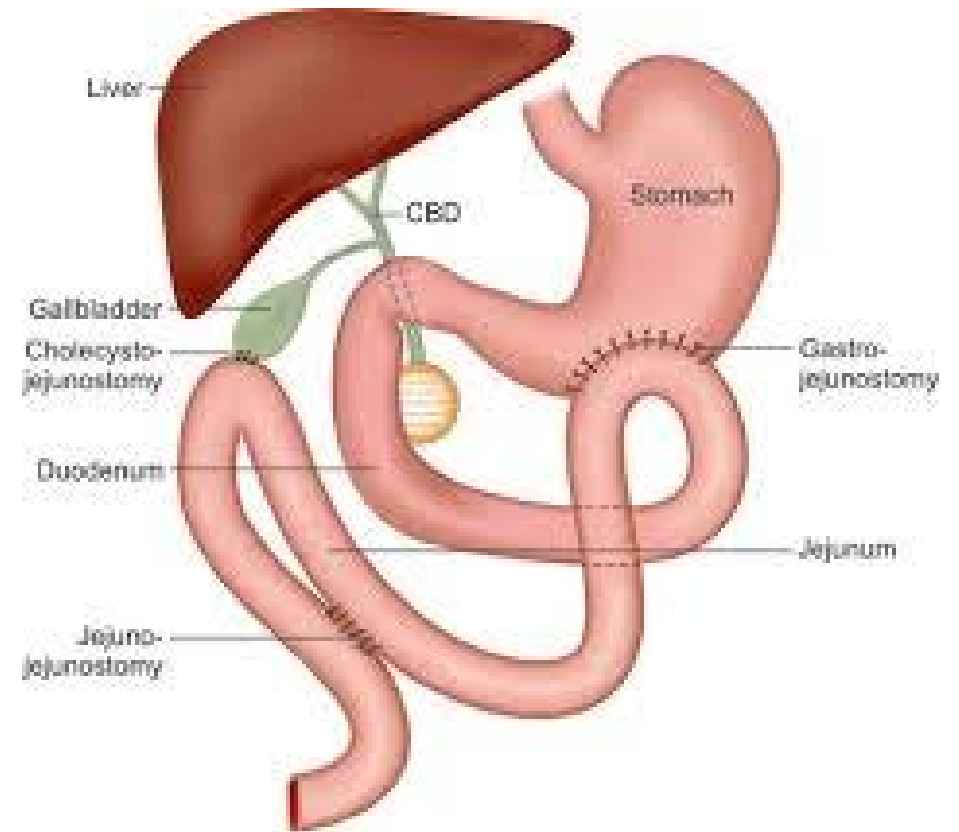
- Pancreas cancer can block the duodenum
- Food is can go thru stomach but cannot go pass the duodenum
- Patients are unable to eat





# Gastric obstruction – treatment

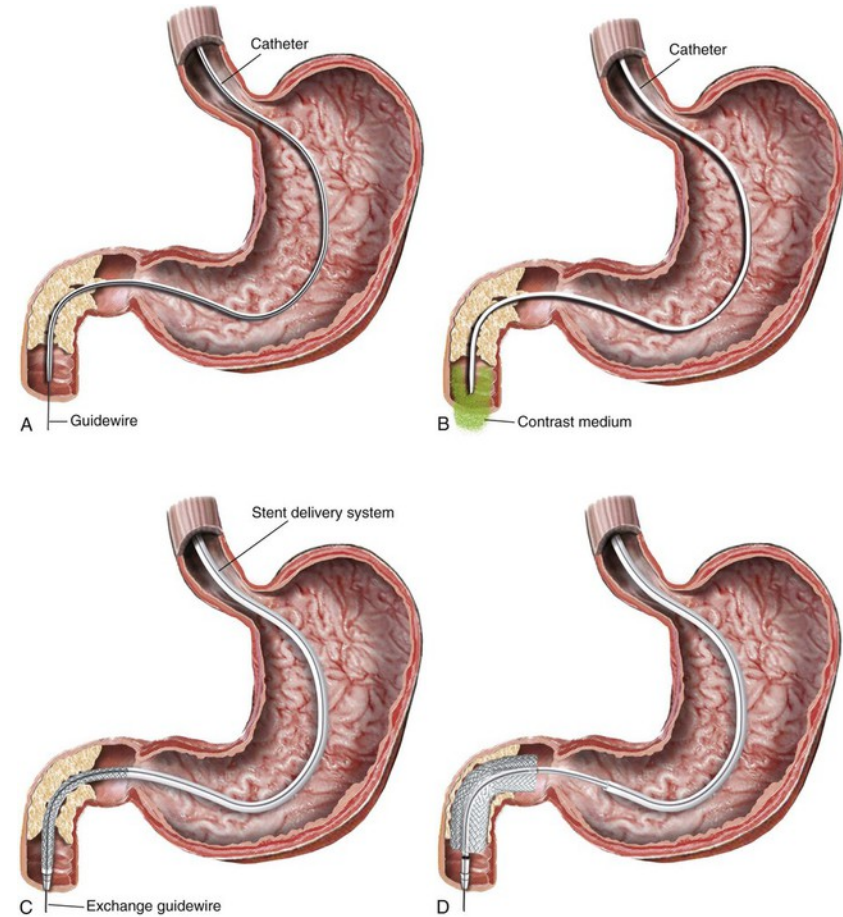
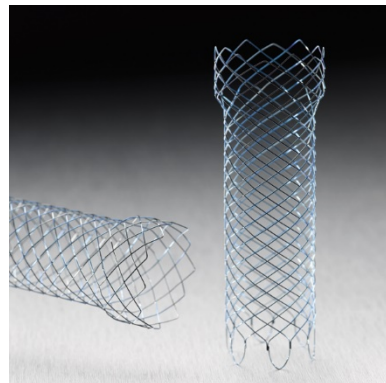
- Surgery
  - Gastrojejunostomy
  - Bypass the blocked intestine





# Gastric obstruction – treatment

- Endoscopic, nonoperative treatment
- Pass a scope from the mouth
- Place a duodenal stent to stretch open the stomach





# Complications of pancreas surgery

- Blood loss
  - Transfusions?
- Infections
  - Wound
  - Pneumonia
  - Urine infections
- Anesthesia complications





# Specific complications

---

- Pancreas leakage
- Bile leakage
- Pancreatitis
- Delayed gastric emptying



# Long term consequences of pancreas surgery

---

- Weight loss
- Malnutrition
  - Malabsorption of fat
- Diabetes
  - 17-29% after distal pancreatectomy
  - 12% after Whipple procedure
- Cancer recurrence



# Pancreas resection, outcomes

---

- Perioperative mortality 2-4%
  - 5 year survival after pancreas surgery – 30%
  - (without surgery, 5 year survival <5%)
- only 15-20% are resectable

# Patient examples



# Ruth Bader Ginsburg

- Initially found to have small pancreatic cancer 2009
- Distal pancreatectomy, splenectomy
- She had a recurrence of her pancreas cancer, treated with radiation
- Died 2020

## Justice Ruth Bader Ginsburg Treated for Pancreatic Cancer

BY KRISTIN REYNOLDS — AUG 23, 2019

f Share

Tweet

Email



U.S. Supreme Court Justice Ruth Bader Ginsburg died of pancreatic cancer on Sept. 18, 2020.



# Patrick Swayze

- 2007 – digestive problems, weight loss
- Risk factor; smoking
- Found to have advanced pancreatic cancer
- Received chemotherapy

Published Nov 13, 2020

## When Heartthrob Patrick Swayze Showed Signs of Pancreatic Cancer He Tried to Delay Doctor Visit; His Wife Wouldn't Let Him



# Alex Trebek

- Diagnosed with stage 4 pancreas cancer in 2019
- Received only chemotherapy

## 'Jeopardy!' Host Alex Trebek Dies at 80 After Pancreatic Cancer Battle—Here's What to Know

He was first diagnosed with the disease in March 2019.

By **Amber Brenza** | November 08, 2020

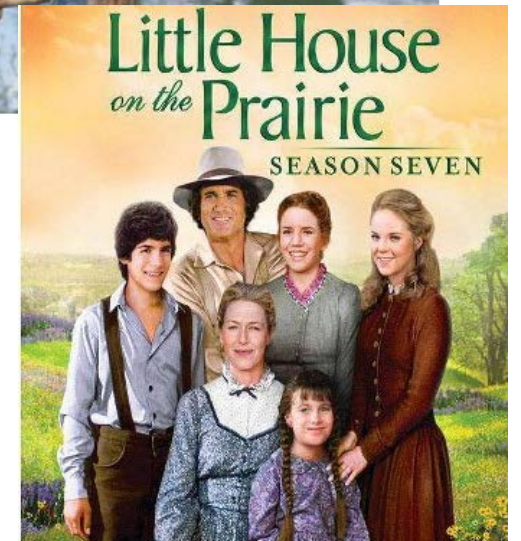




# Michael Landon

- Diagnosed with pancreatic cancer at 54
- Spread to liver at diagnosis
- 30 years later, ?if his cancer was related to filming near Santa Susana Nuclear Laboratory

**Did Michael Landon Really Get Cancer From The “Little House On The Prairie Location”? Beloved Actor Passed Away From Pancreatic Cancer**





# Steve Jobs

- Neuroendocrine tumor
- Tumor of the hormone producing cells
- Surgical resection is best treatment
- He opted for alternative therapies first
- Pancreas resection
- Liver transplant for localized liver metastases

HUNT FOR THE CURE ☹

## *Steve Jobs Dies: His Unorthodox Treatment for Neuroendocrine Cancer*

| HEALTH |



Sharon Begley | Updated Jul. 13, 2017 9:53PM ET / Published Oct. 05, 2011 10:01PM ET





# Pancreas surgery for cancer

---

- Conclusions
  - Two main types of cancer surgery
    - Palliative
    - Curative
  - Type of surgery is also dependent on location of the tumor
  - Surgery can be complex and about 20% will have some type of complication
  - Most patients with pancreas cancer will have too advanced cancer to consider curative surgery
  - Hopefully newer chemotherapy with surgery will be more helpful in improving long term survival



---

Questions?



# Whipple procedure

---

- Goals
  - Remove the head of the pancreas with the tumor
  - Remove that part of the bile duct that is blocked
  - Remove the part of the intestine (duodenum and stomach) around the head of the pancreas
- Reconstruction
  - Connect pancreas to intestine
  - Connect bile duct to intestine
  - Connect stomach to intestine