Disorders of the Small Intestine

- ***Abnormal Digestion of Food in the Small Intestine(Pancreatic Failure)***
- **Lack of pancreatic secretion frequently occurs**
  - **In *pancreatitis***
  - **When the *pancreatic duct is blocked* by a gallstone at the ampulla of Vater.**
  - **When *head of the pancreas has been removed* because of malignancy.**

- **Loss of pancreatic juice means loss of trypsin, chymotrypsin, carboxypolypeptidase, pancreatic amylase, pancreatic lipase, and still a few other digestive enzymes.**
- **Without these enzymes, up to *60* percent of the *fat* entering the small intestine may be unabsorbed, as well as *one third to one half* of the *proteins and carbohydrates*.**
- **As a result, large portions of the ingested food cannot be used for nutrition and copious, fatty feces are excreted. *(Steatorrhea).***

Pancreatitis-Inflammation of the Pancreas

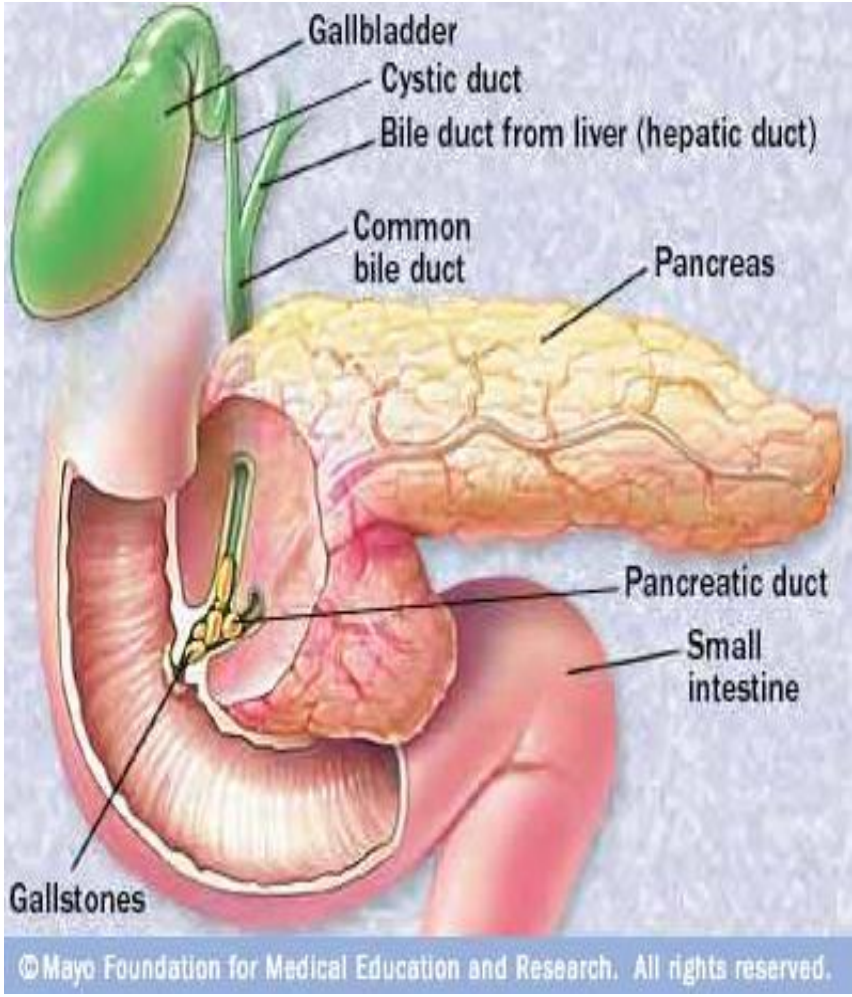
- **Pancreatitis can be either *acute pancreatitis* or *chronic pancreatitis.***

The most common cause of acute pancreatitis are:

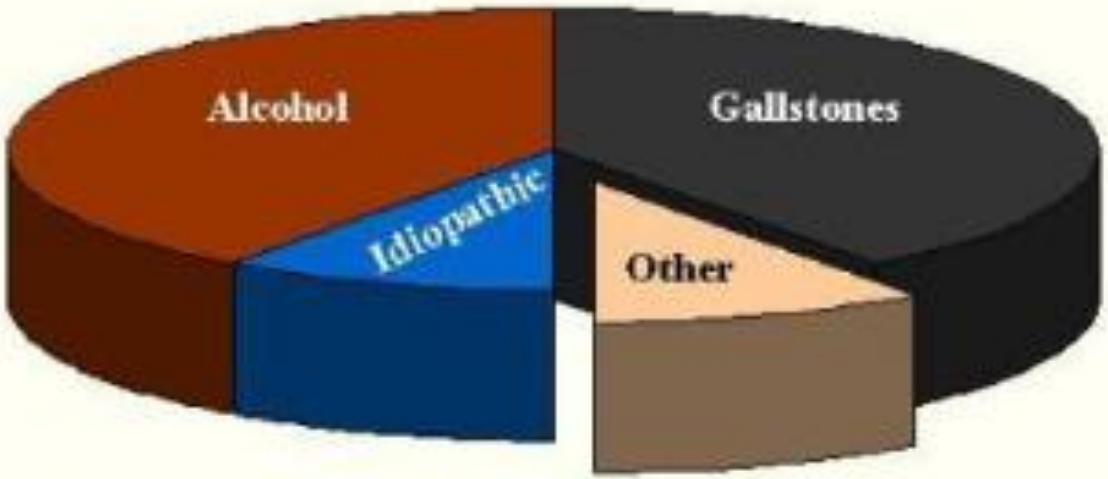
- **B*lockage of the papilla of Vater* by a *Gall bladder stone***
- ***Drinking excess Alcohol.***

The two together account for more than *90 percent* of all cases.

(Auto-digestion)



Pancreatitis: Etiology



- Drugs
- Infectious agents
- Hyperlipidemia
- Hypercalcemia
- Ductal obstruction
- Trauma
- Hypotension
- Post-operative
- Miscellaneous

M.N.

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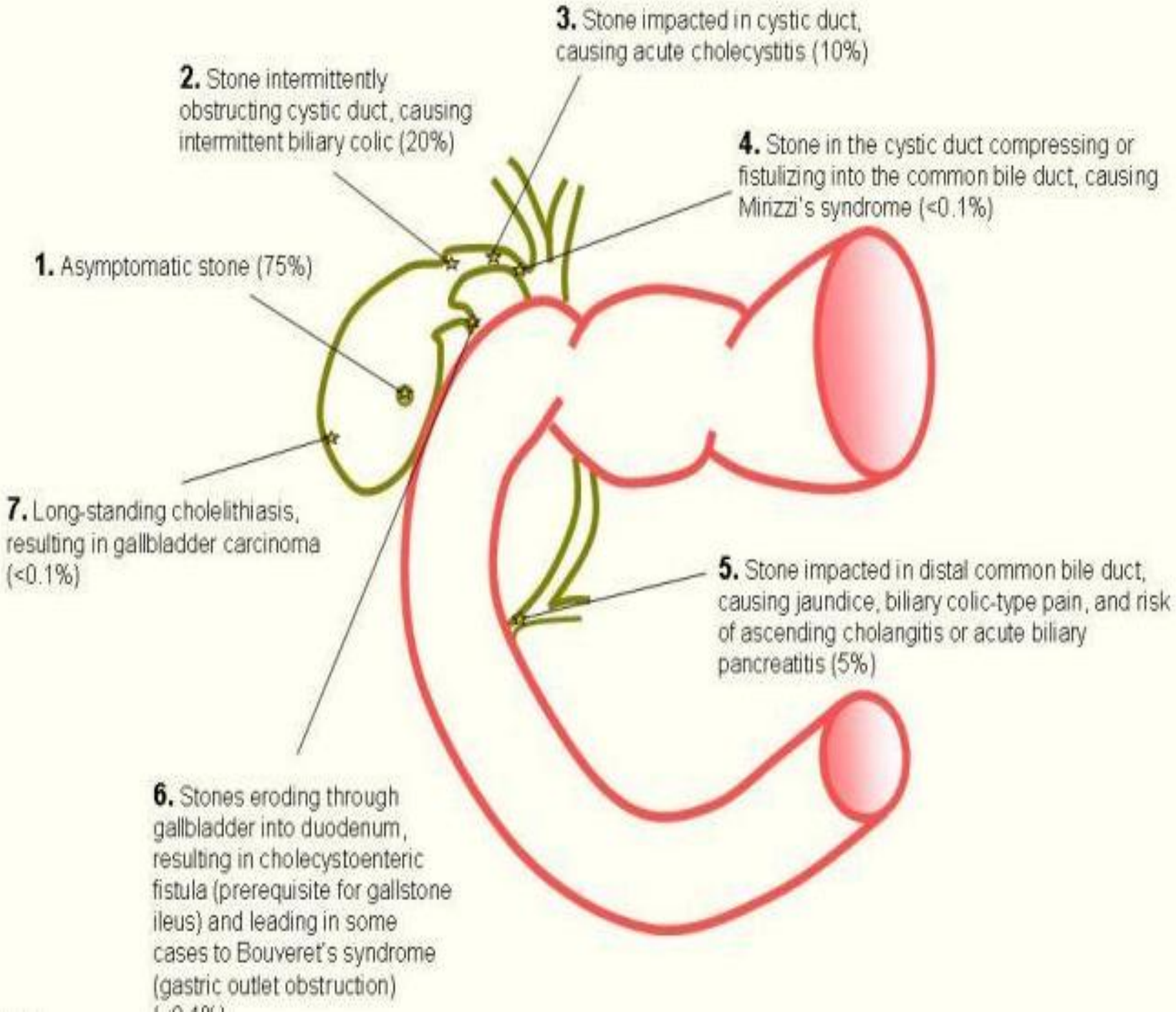
Pancreatitis: Clinical Features

Signs & Symptoms	Lab Tests	Differential Diagnosis
Abdominal pain	↑ WBC	Choledocholithiasis
Abdominal tenderness	↑ Serum amylase	Perforated ulcer
Nausea and vomiting	↑ Serum lipase	Mesenteric ischemia
Fever		Intestinal obstruction
Tachycardia		Salpingitis
		Ectopic pregnancy

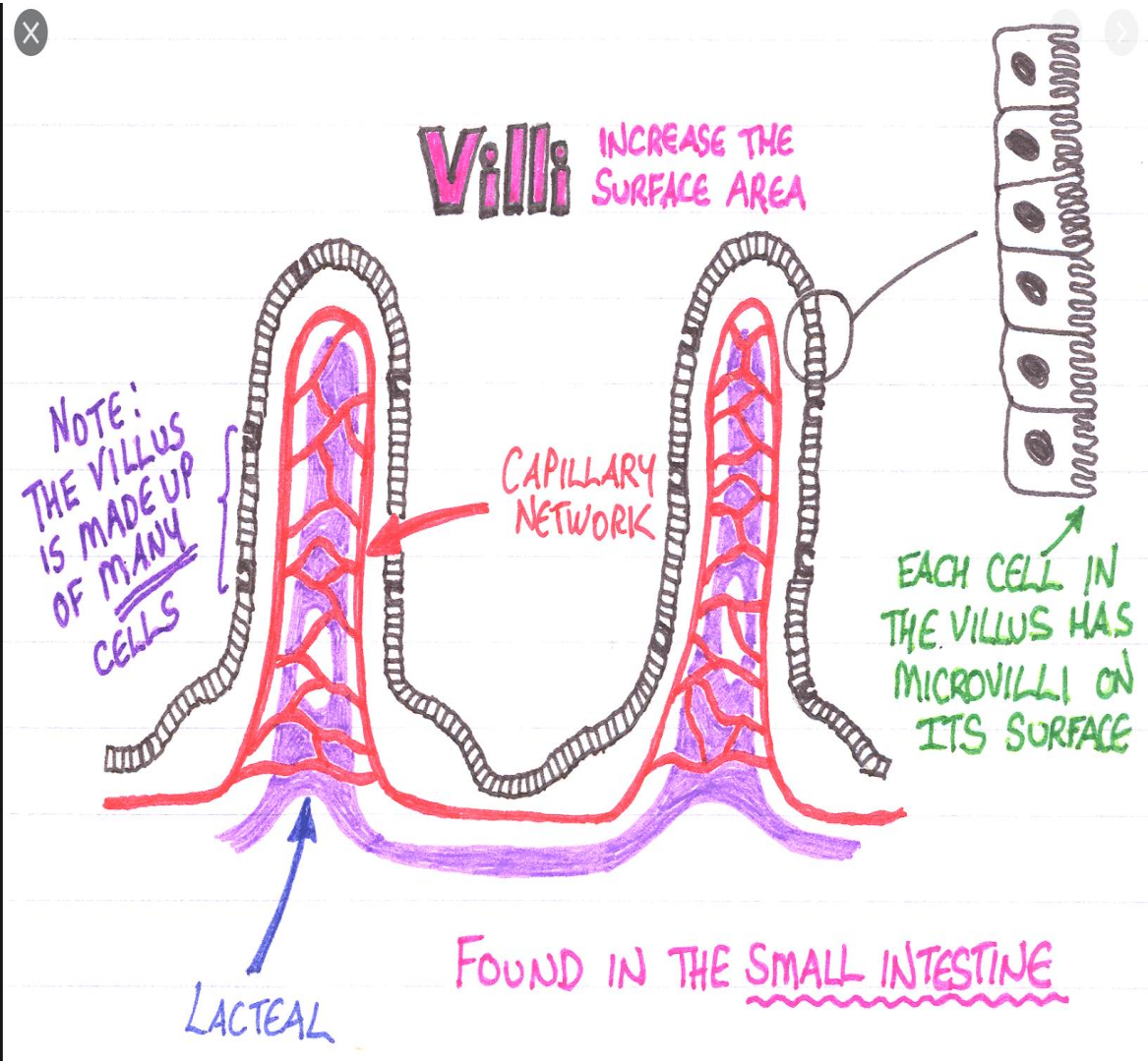

3. Stone impacted in cystic duct, causing acute cholecystitis (10%)
2. Stone intermittently obstructing cystic duct, causing intermittent biliary colic (20%)
4. Stone in the cystic duct compressing or fistulizing into the common bile duct, causing Mirizzi's syndrome (<0.1%)
1. Asymptomatic stone (75%)
7. Long-standing cholelithiasis, resulting in gallbladder carcinoma (<0.1%)
5. Stone impacted in distal common bile duct, causing jaundice, biliary colic-type pain, and risk of ascending cholangitis or acute biliary pancreatitis (5%)
6. Stones eroding through gallbladder into duodenum, resulting in cholecystoenteric fistula (prerequisite for gallstone ileus) and leading in some cases to Bouveret's syndrome (gastric outlet obstruction)

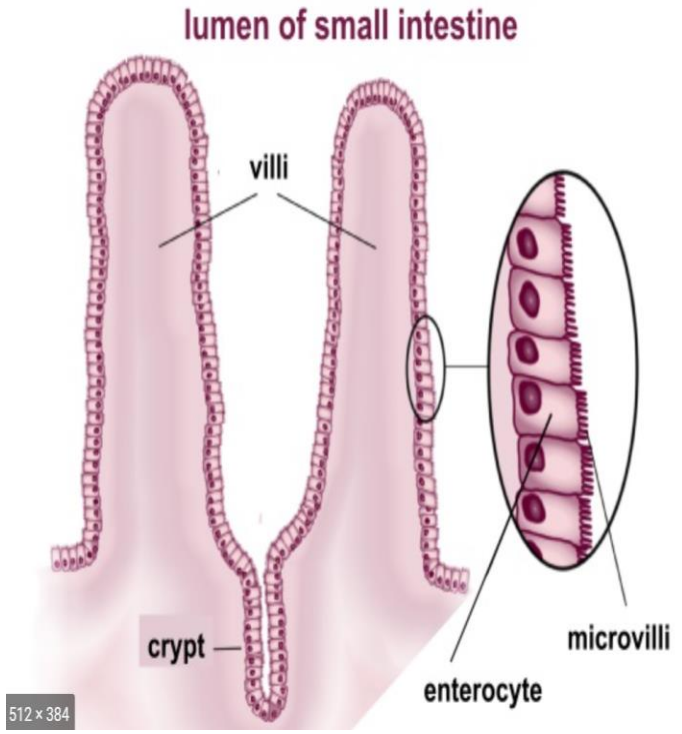
Malabsorption by the Small Intestinal Mucosa-Sprue

- ***Sprue:*** **are diseases which lead to decrease mucosal absorption.**
- **Malabsorption also can occur when large portions of the small intestine have been removed.**
- ***Non Tropical Sprue :*** **(*Idiopathic Sprue, celiac disease* (in children), or *gluten enteropathy*)**

Results from the toxic effects of *gluten* present in certain types of grains , especially wheat& rye.

- **Gluten has a direct destructive effect on *Intestinal Enterocytes.***
- **In milder forms of the disease, only the *Microvilli* of the absorbing enterocytes on the villi are destroyed, thus decreasing the absorptive surface area as much as *Two Folds*.**
- **In the more severe forms, the *Villi* themselves become blunted or disappear altogether, thus still further reducing the absorptive area of the gut**
- **Treatment**


Villi
INCREASE THE SURFACE AREA
NOTE: THE VILLUS IS MADE UP OF MANY CELLS
CAPILLARY NETWORK
EACH CELL IN THE VILLUS HAS MICROVILLI ON ITS SURFACE
LACTEAL
FOUND IN THE SMALL INTESTINE


lumen of small intestine
villi
crypt
enterocyte
microvilli
512 × 384

Tropical Sprue

Caused by inflammation of the intestinal mucosa resulting from *Unidentified Infectious Agents.*

Malabsorption in Sprue

In the early stages of Sprue, there is impaired absorption of *Fat Only* .

The fat that appears in the stools is almost entirely in the form of *Salts of Fatty Acids Rather than Undigested Fat* , demonstrating that the problem is one of *Absorption, not of Digestion.* In fact, the condition is frequently called *Steatorrhea* which means simply excess fats in the stools.

- **In severe cases of Sprue, there is impaired absorption of *Fat, Proteins, Carbohydrates, Calcium, Vitamin K, Folic acid, and vitamin B_{12}*. As a result, the person suffers from:**
- **Severe nutritional deficiency, developing wasting of the body.**
- **Osteomalacia (demineralization of the bones because of lack of calcium).**
- **Inadequate blood coagulation caused by lack of vitamin K.**
- **Macrocytic anemia of the pernicious anemia type, due to diminished vitamin B_{12} and folic acid absorption.**

Disorders of the Large Intestine

Constipation:

Constipation means *slow movement of feces through the large intestine.*

It is often associated with large quantities of dry, hard feces in the descending colon that accumulate because of *overabsorption of fluid.*

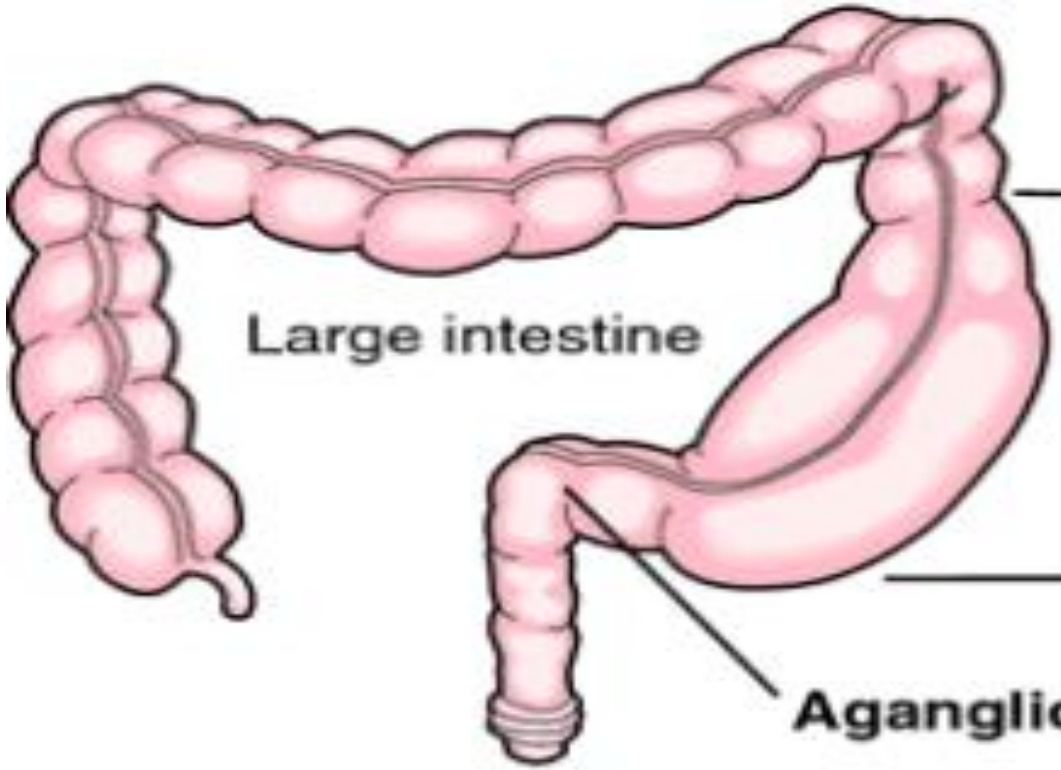
- **Tumors, Adhesions ,Ulcers(Organic), *Atony*, Spasm(IBS) Functional.**
- **If a person establishes regular bowel habits early in life, defecating when the *Gastro Colic and duodenocolic reflexes cause mass movements* in the large intestine, the development of constipation in later life is much less likely.**
- **Alternating constipation and diarrhea.**

Mega Colon (Hirschsprung's Disease)

- **The colon sometimes distend to a diameter of *3 to 4 inches.* (severe constipation) The condition is called *mega colon*, or *Hirschsprung's disease.***

- **The cause of mega colon is lack of or deficiency *of ganglion cells in the Myenteric Plexus in a segment of rectum and lower sigmoid.***

- **The sigmoid itself becomes small and almost spastic while feces accumulate proximal to this area, causing mega colon in the ascending, transverse, and descending colons.**



Megacolon

Dilated with feces and gas

Ganglion cells present (normal in function)

Aganglionic region

Tonic contraction and inadequate peristalsis

Partial obstruction

Chronic constipation

Enterocolitis

Enlargement of proximal segment

Complete bowel obstruction

3.Ulcerative Colitis

- **Extensive areas of the walls of the large intestine become inflamed and ulcerated.**
- **The motility of the ulcerated colon is often so great that Mass Movements occur much of the day rather than for the usual 10 to 30 minutes.**
- **Also, the colon's secretions are greatly enhanced. As a result, the patient has repeated diarrheal bowel movements *(Bloody).***

Ulcerative Colitis

- Unknown etiology , confined to large bowel, auto antibodies or infection triggers inappropriate immune response → destruction of mucosa
- Stress, psycho somatic.
- Infective E.coli
- Immunological lymphocytes
- ***Chronic bloody diarrhea, feces mixed with blood ,mucus and pus.***

- **Proctitis:** involves only the rectum (a)
- **Proctosigmoiditis:** involves the rectum and sigmoid colon (b)
  (the lower segment of the colon before the rectum
- **Distal colitis:** involves only the left side of the colon (c)
- **Pancolitis:** involves the entire colon (d)
- **Backwash ileitis:** involves the distal ileum