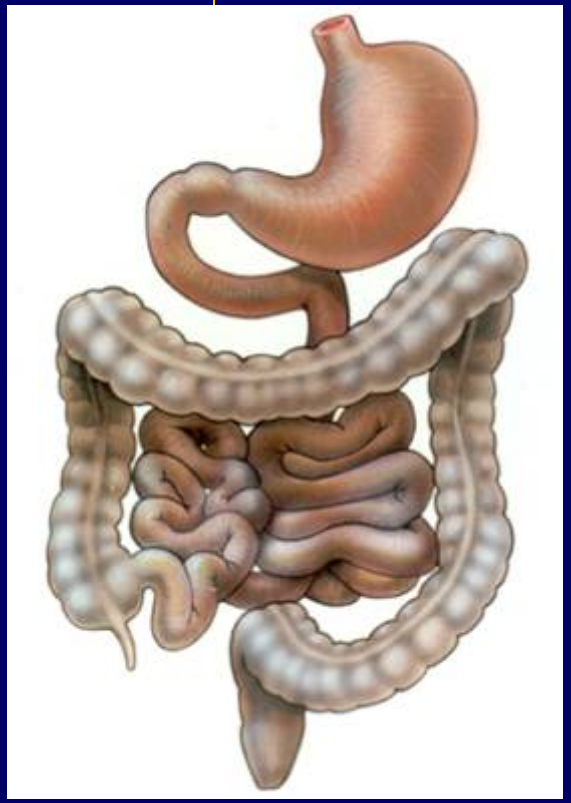
PATHOLOGY OF THE DIGESTIVE SYSTEM

- The BASICS -

Celia Marginean, MD



DIGESTIVE SYSTEM

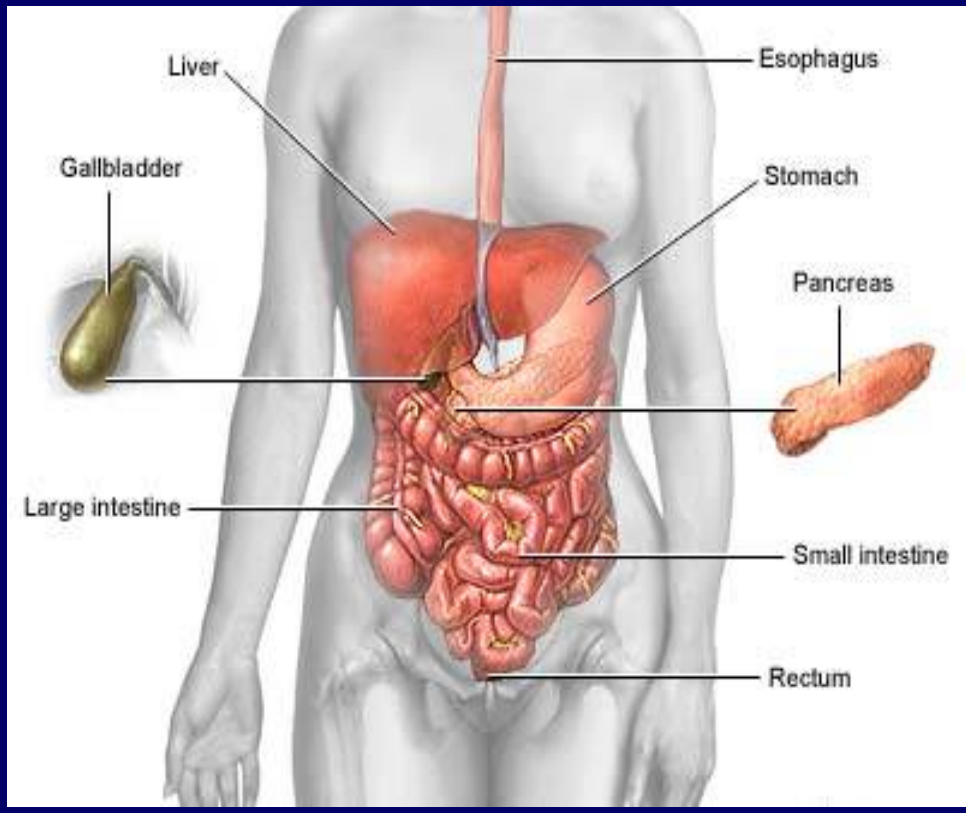
1. GASTRO-INTESTINAL (GI) TRACT:

- ESOPHAGUS
- STOMACH
- SMALL INTESTINE (DUODENUM, JEJUNUM, ILEUM)
- LARGE INTESTINE (COLON)
- RECTUM
- ANAL CANAL
- APPENDIX

2. LIVER

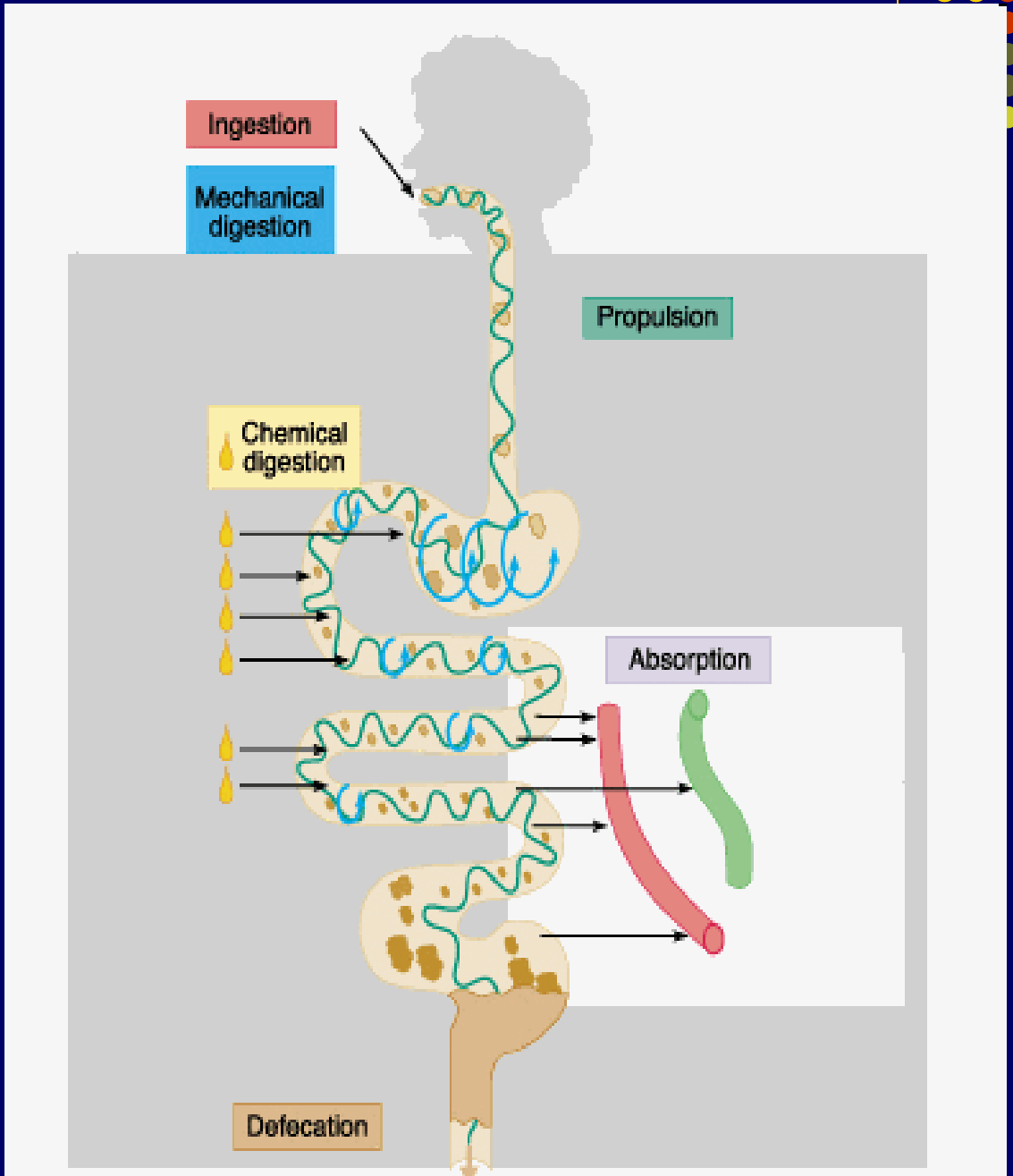
3. PANCREAS

4. GALLBALDER

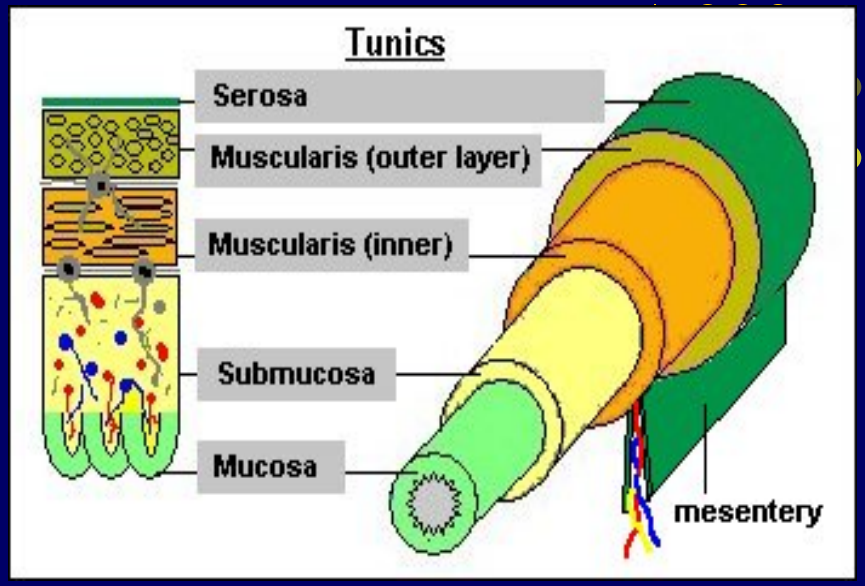


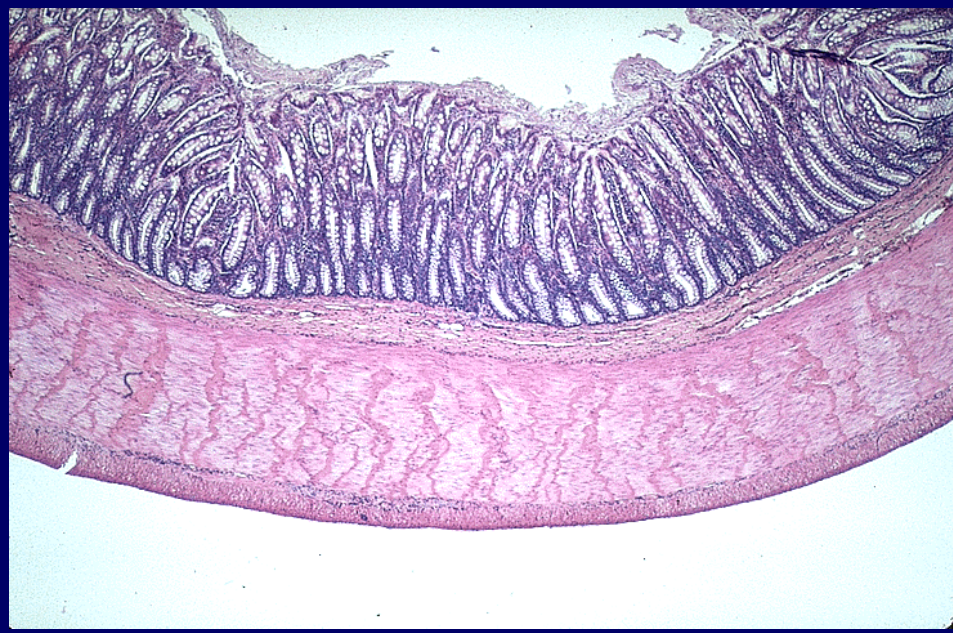
DIGESTIVE SYSTEM

A). Ingestion
B). **Mechanical**
C). **Chemical**
Ingestion
D). **Absorption**
E). **Defecation**
F). **Propulsion**

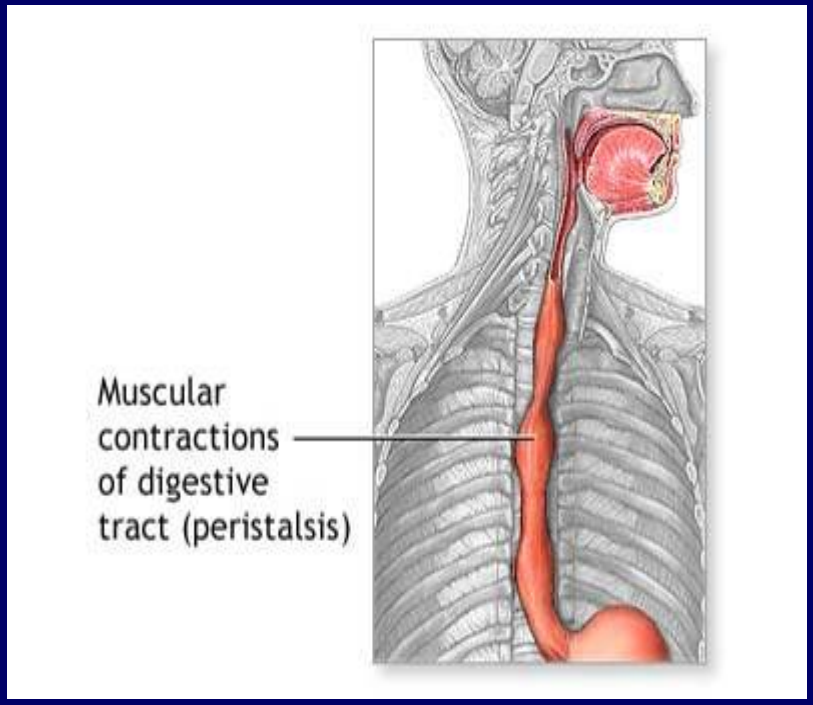


- Alimentary canal is a hollow tube
- The wall has 4 layers:
  - Mucosa – epithelium, lamina propria, muscularis mucosae
  - Submucosa
  - Muscularis propria – two layers
  - Serosa (adventitia)



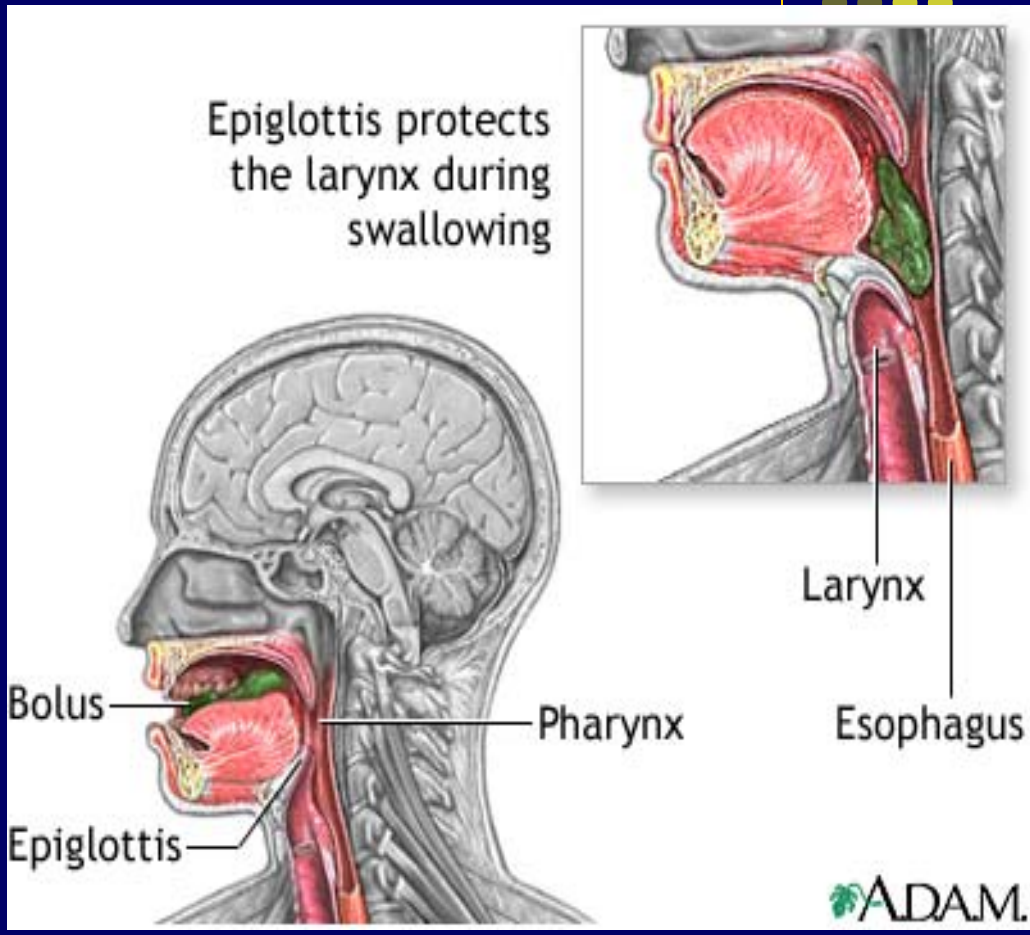


ESOPHAGUS

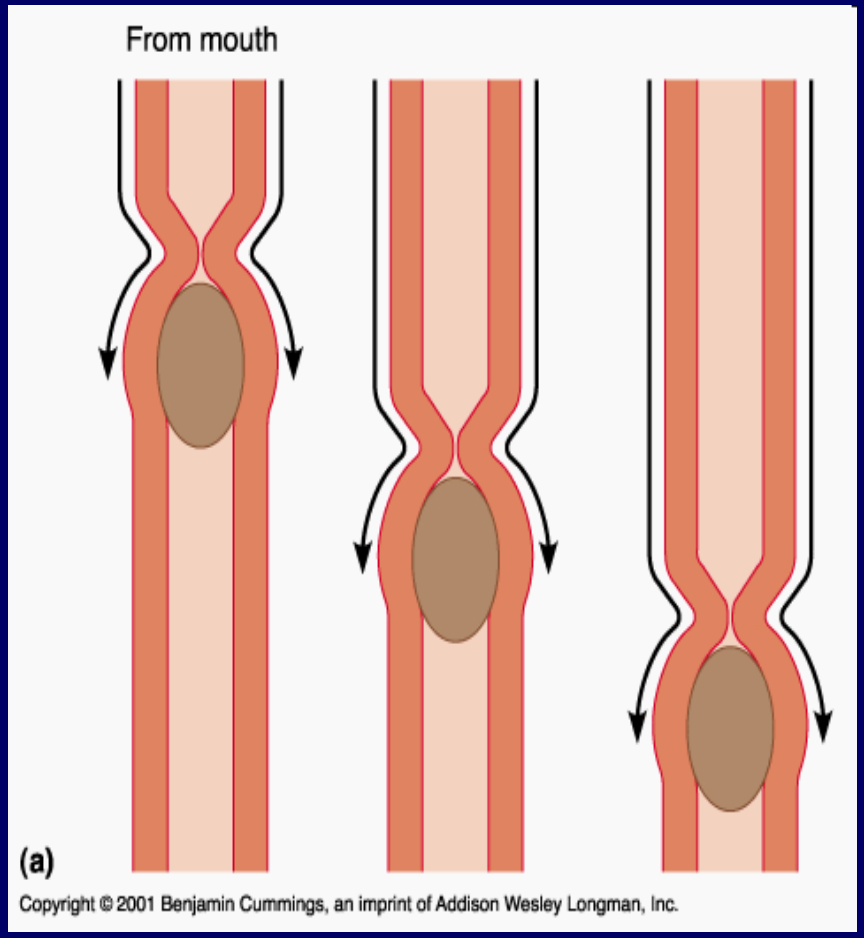


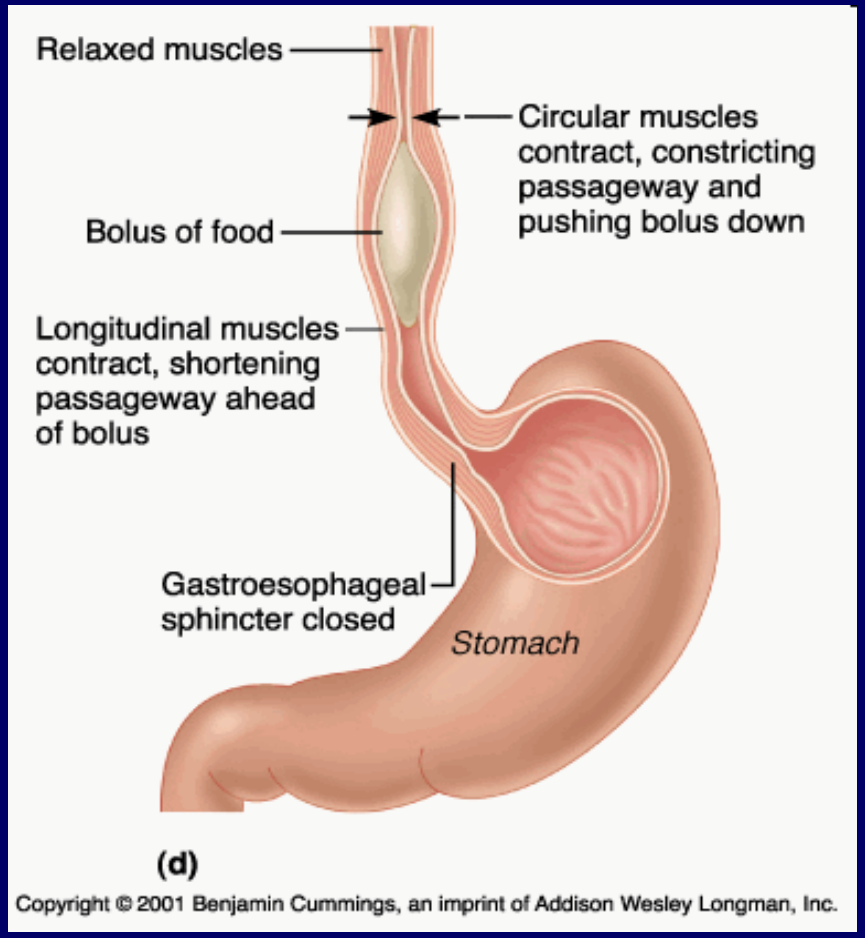
ESOPHAGUS

- 25 cm length
- Continues oropharynx to GEJ
- Swallowed food passes through pharynx into esophagus down to stomach



Propulsion and peristalsis of esophagus



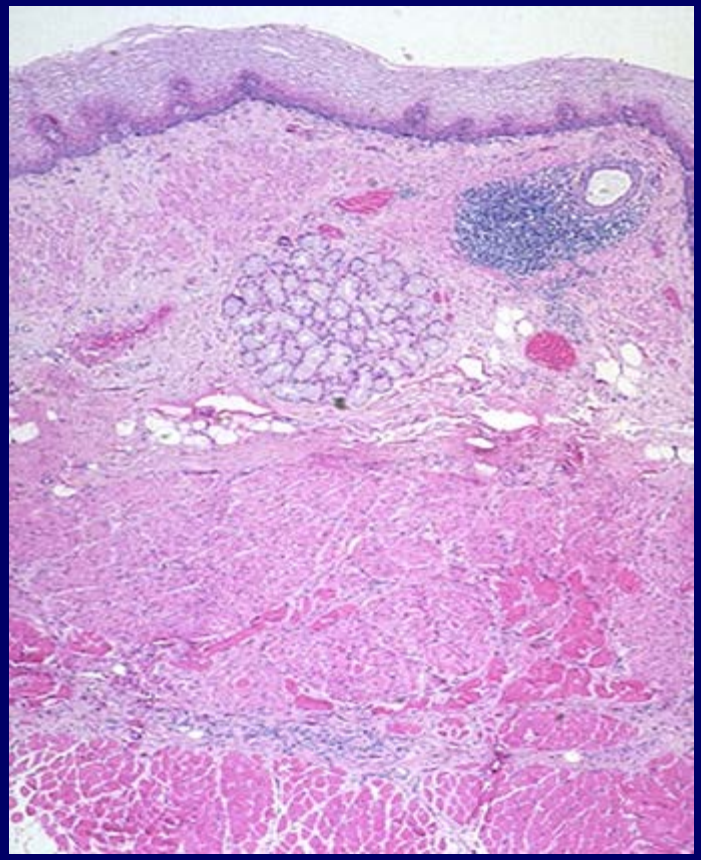


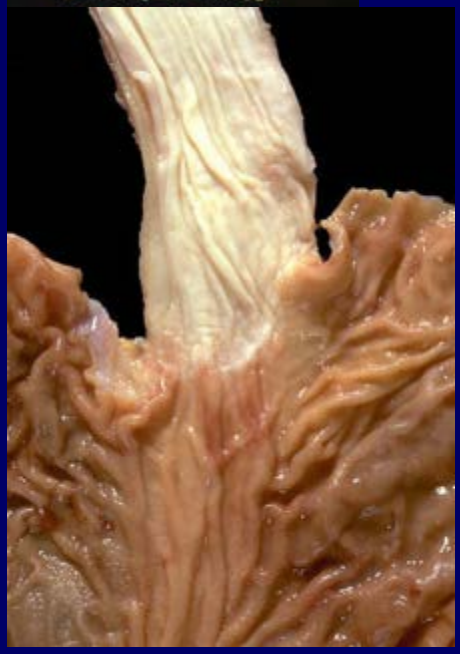
ESOPHAGUS

Squamous epithelium

Submucosa with mucus secreting glands

Muscularis propria (inner circular and outer longitudinal layers)





ESOPHAGUS - PATHOLOGY

- INFLAMMATION / INFECTIONS (Esophagitis)
- DISORDERS OF PERISTALTIS
- VASCULAR LESIONS
- TRAUMA
- NEOPLASIA

ESOPHAGITIS

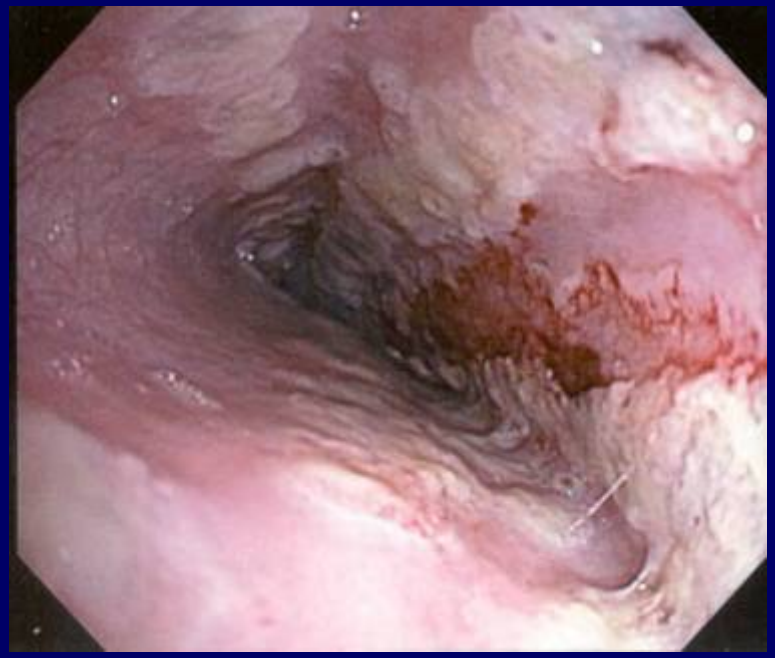
- Epithelial damage due to inflammation
- Most common cause is gastroesophageal reflux -GERD- (reflux of gastric contents into lower esophagus)
- Infectious causes are much less common - Candida, herpes virus, CMV, bacteria (immunocompromised)
- Chemical (erosive) esophagitis - acids, alkali

Reflux esophagitis

- Most common; due to reflux of gastric contents into lower esophagus
- Physiology: chronic exposure to gastric juices (acid) impairs reparative capacity of esophageal mucosa
- Clinical : heartburn, regurgitation, pain (may be mistaken for myocardial infarction)

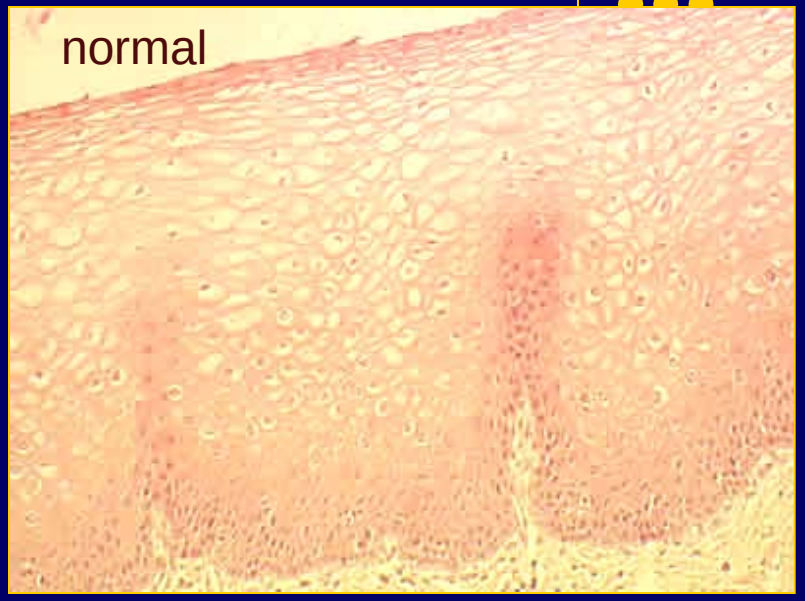
Reflux esophagitis

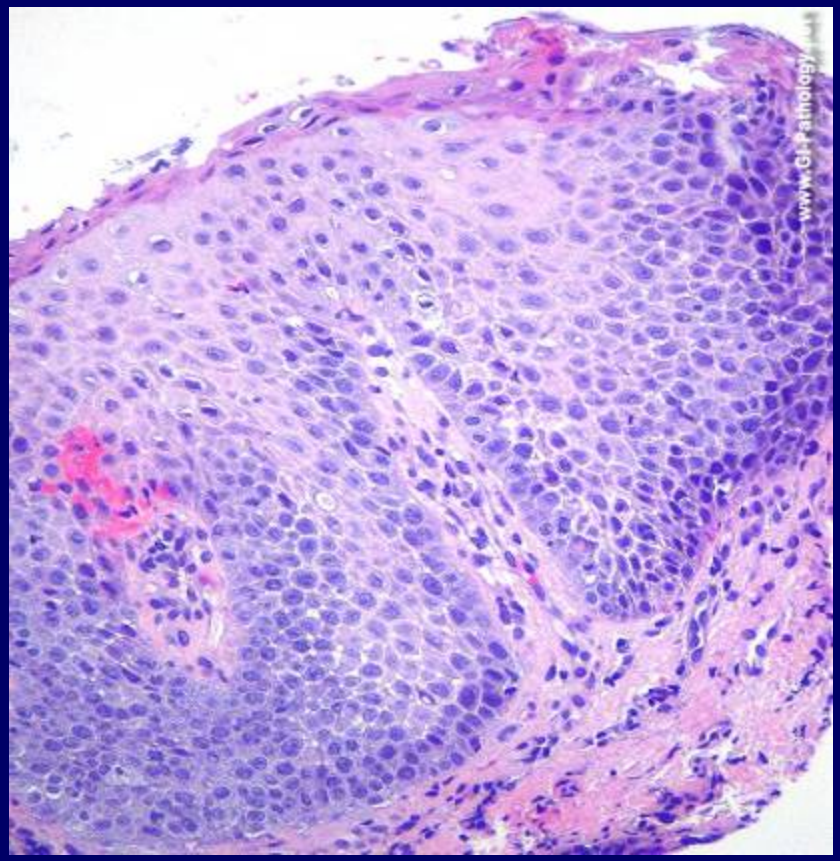
- Incidence 3-4% in general population
- Usually in adults over age 40
- Long term consequences are bleeding (almost never massive), stricture, Barrett's esophagus (intestinal metaplasia)
- **Gross:** severe cases exhibit hyperemic mucosa with focal hemorrhage

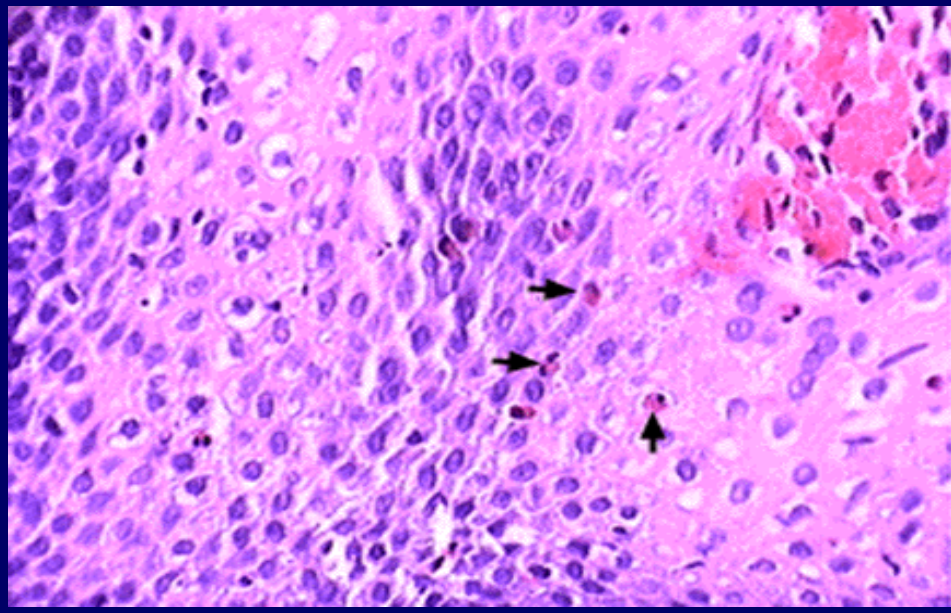


Reflux esophagitis

- hyperplastic vascular papillae
- basal hyperplasia
- intraepithelial eosinophils
- parakeratosis.

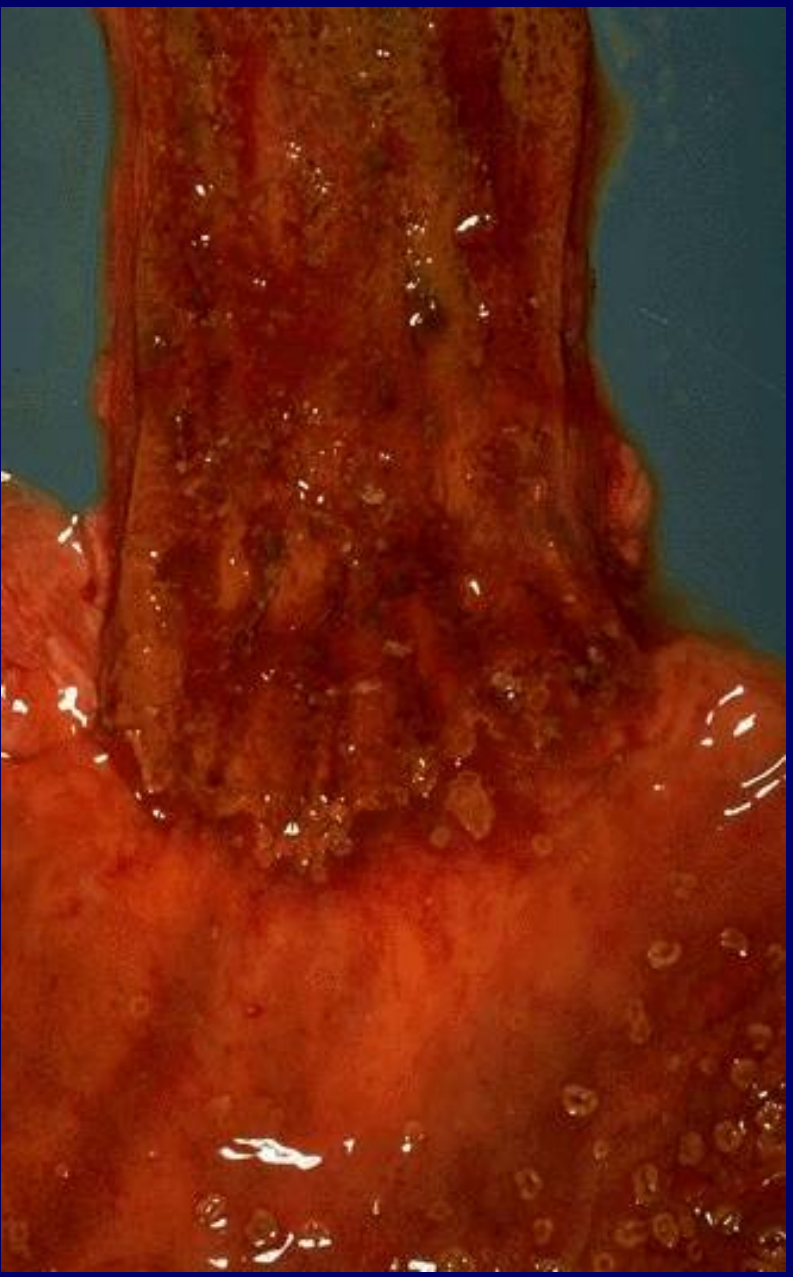


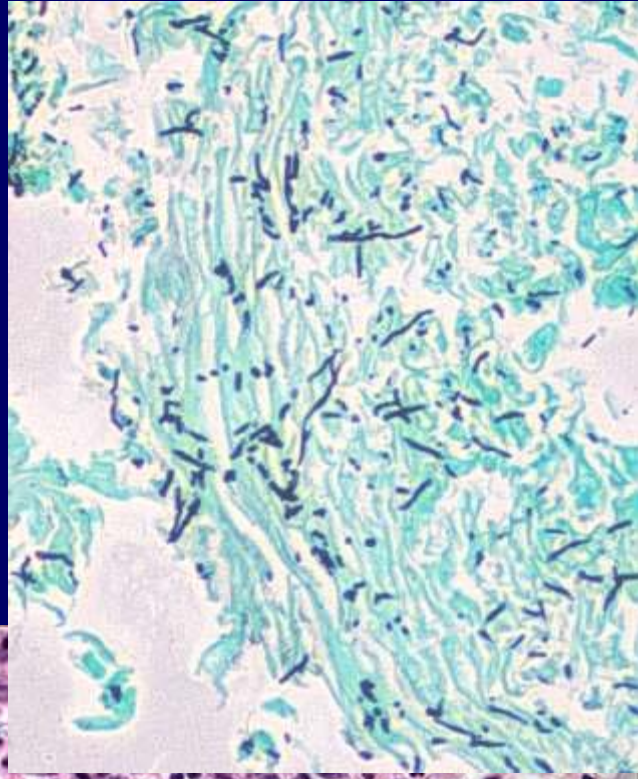


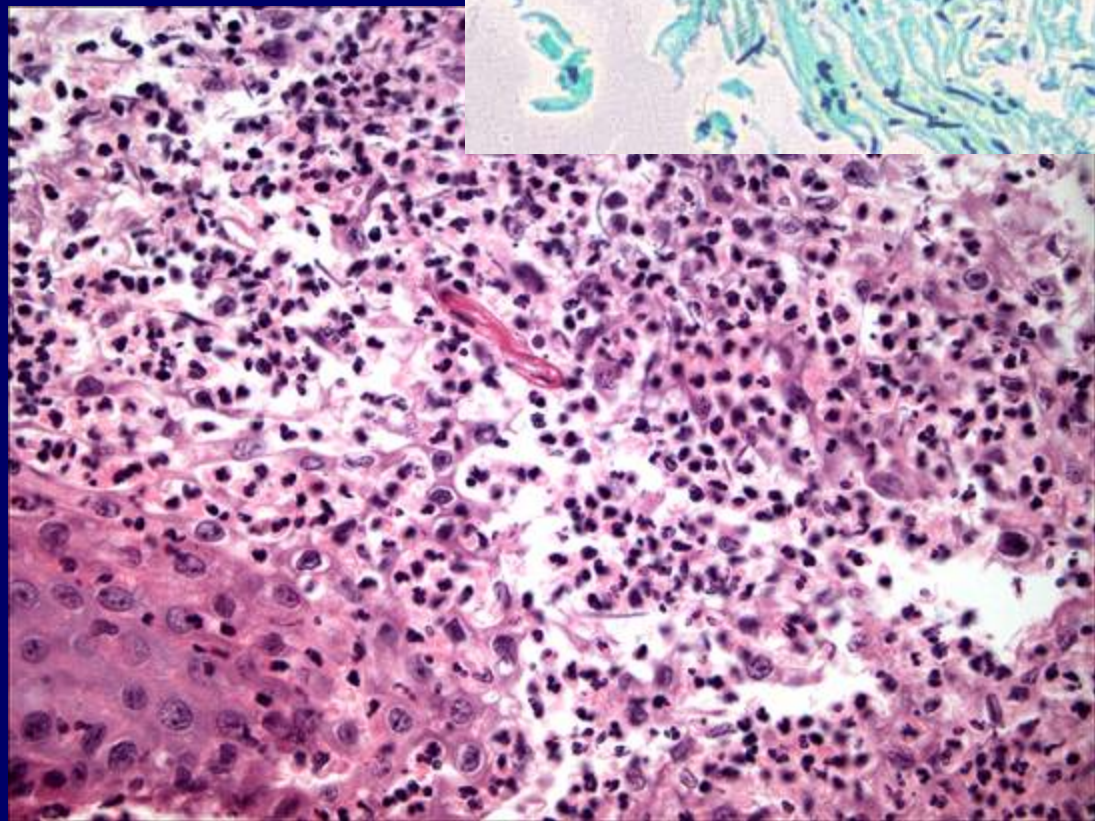


Candida esophagitis

- Most common cause of infectious esophagitis
- Associated with antibiotic use in non-immunocompromised
- Usually due to Candida albicans
- Note: fungal invasion a requirement for diagnosis since Candida is normal flora in GI tract
- Often associated with CMV or HSV esophagitis
- **Endoscopy:** gray-white pseudomembrane or plaques in mid- to distal esophagus; mucosa is erythematous, edematous, ulcerated or friable

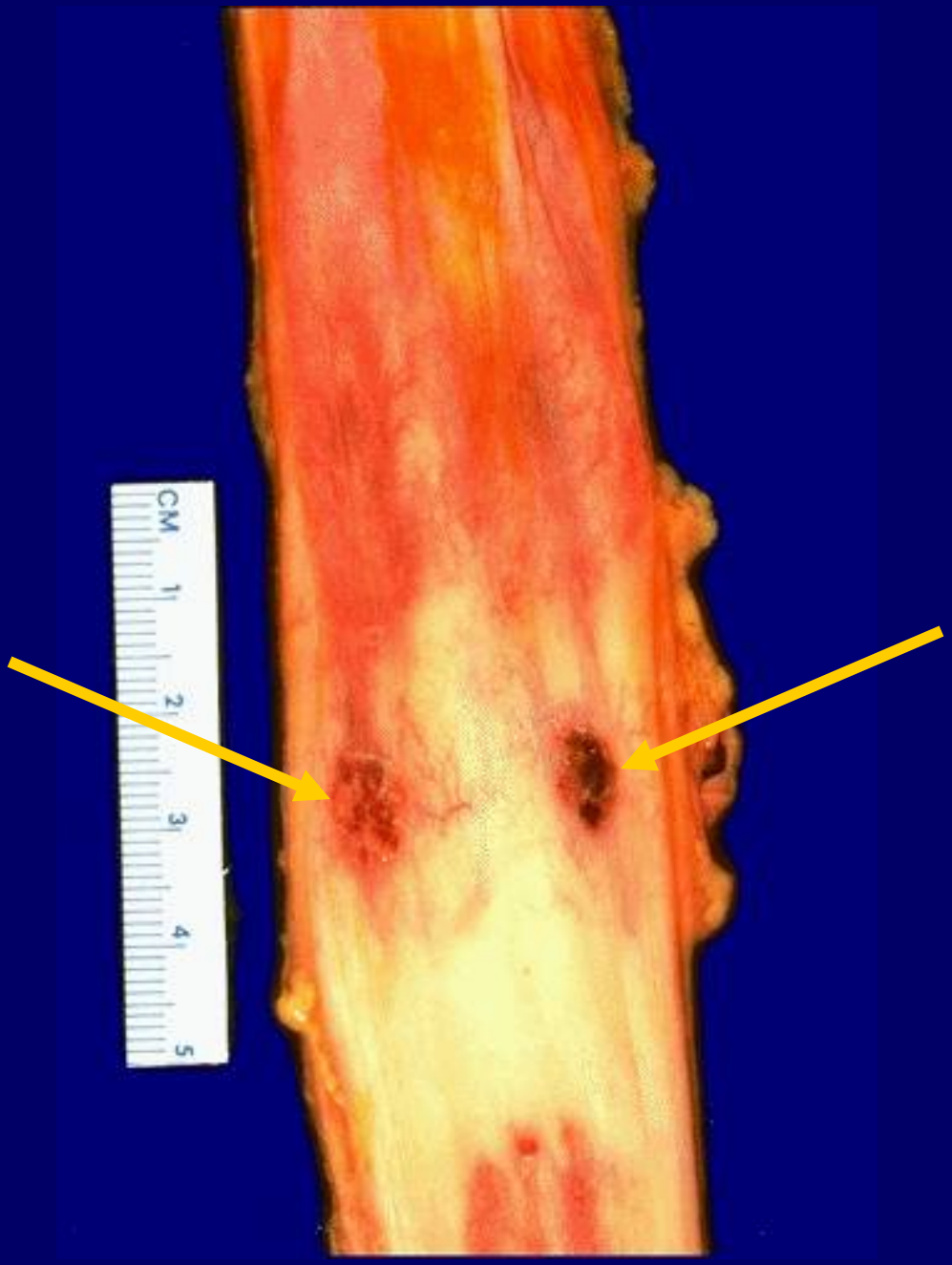






Herpes esophagitis

- Usually an opportunistic infection in immunosuppressed patients
- May also have secondary bacterial or fungal infections
- Self-limited in healthy patients; may cause esophageal perforation or disseminate in immunocompromised patients
- **Gross:** shallow vesicles and ulcers; may coalesce into extensive areas of erosion
- **Micro:** ulcers contain necrotic debris and exudate with neutrophils; viral inclusions present in multinucleated squamous cells at margin of ulcer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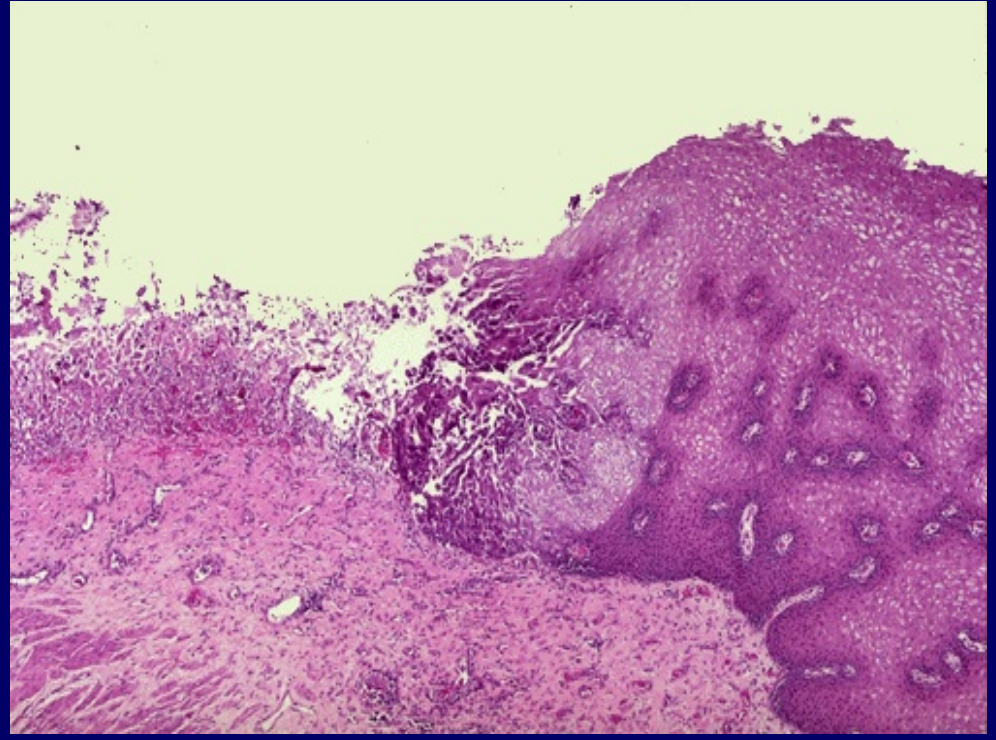
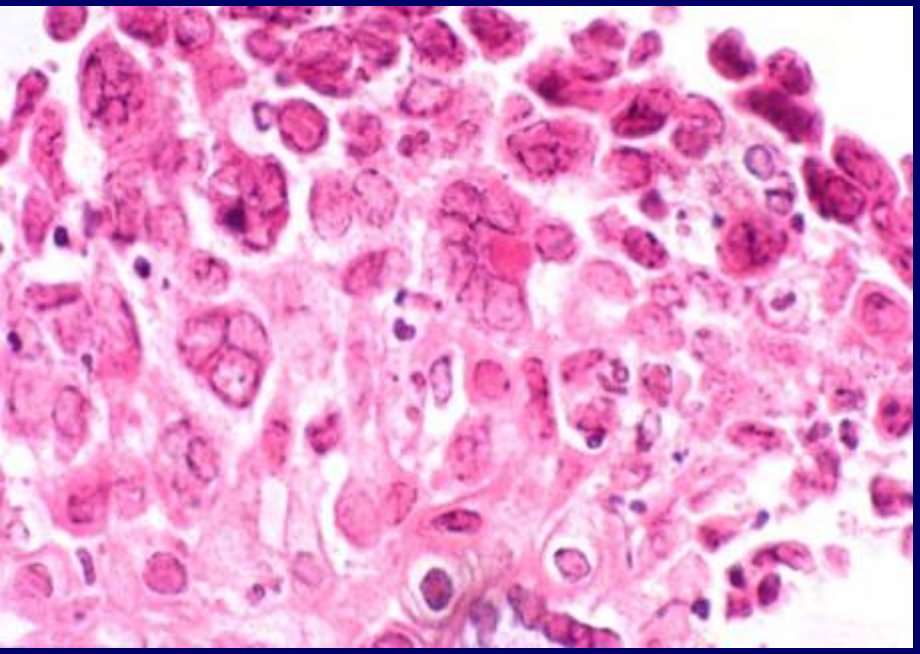
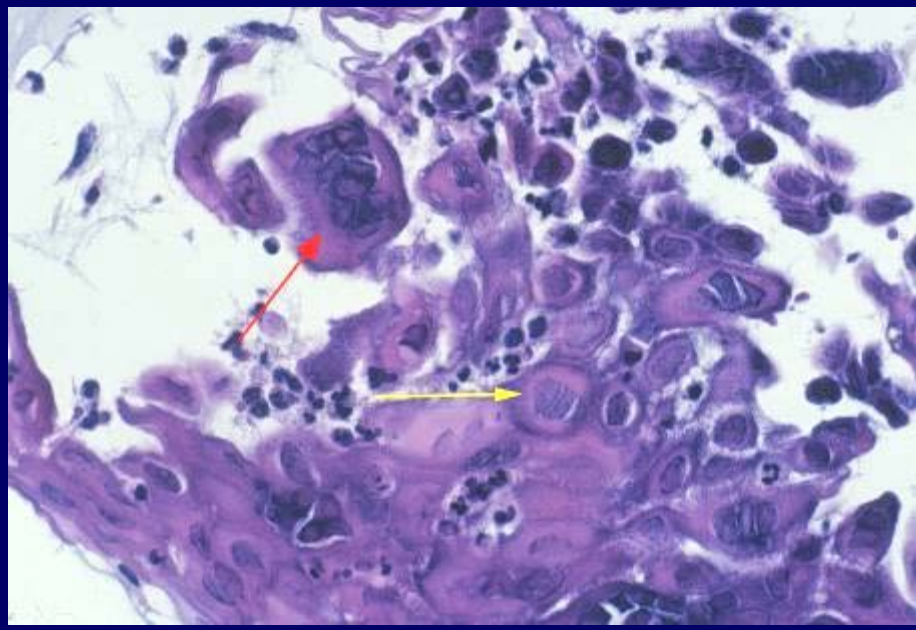






Barrett's esophagus

- Distal squamous mucosa is replaced by metaplastic columnar epithelium (intestinal type) as a response to prolonged injury; columnar epithelium may be more resistant to acid, pepsin and bile
- Mean age at diagnosis is 60+; usually men
- Major risk factor for esophageal adenocarcinoma
- **Symptoms:** long history of heartburn and other reflux symptoms
- **Treatment:** anti-reflux therapy; endoscopy every 1-2 years to detect dysplasia or early adenocarcinoma

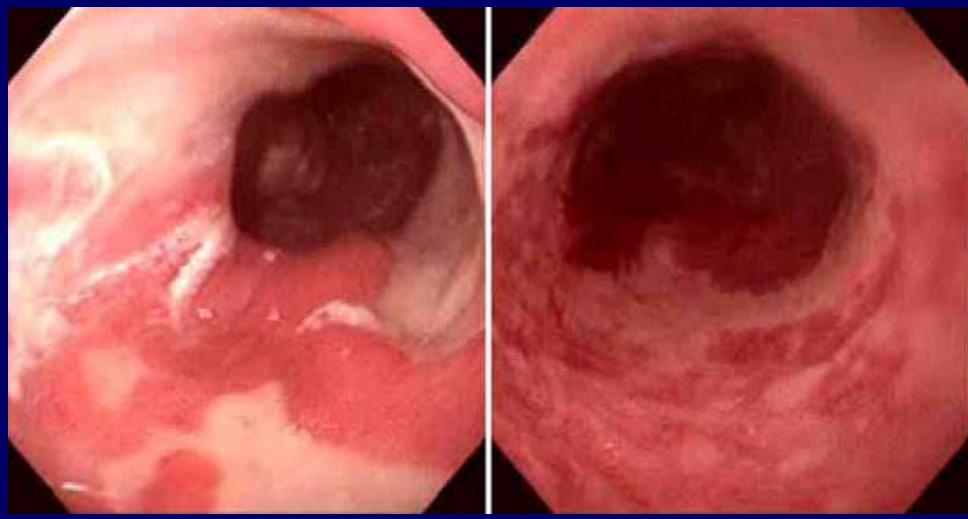
Barrett’s esophagus

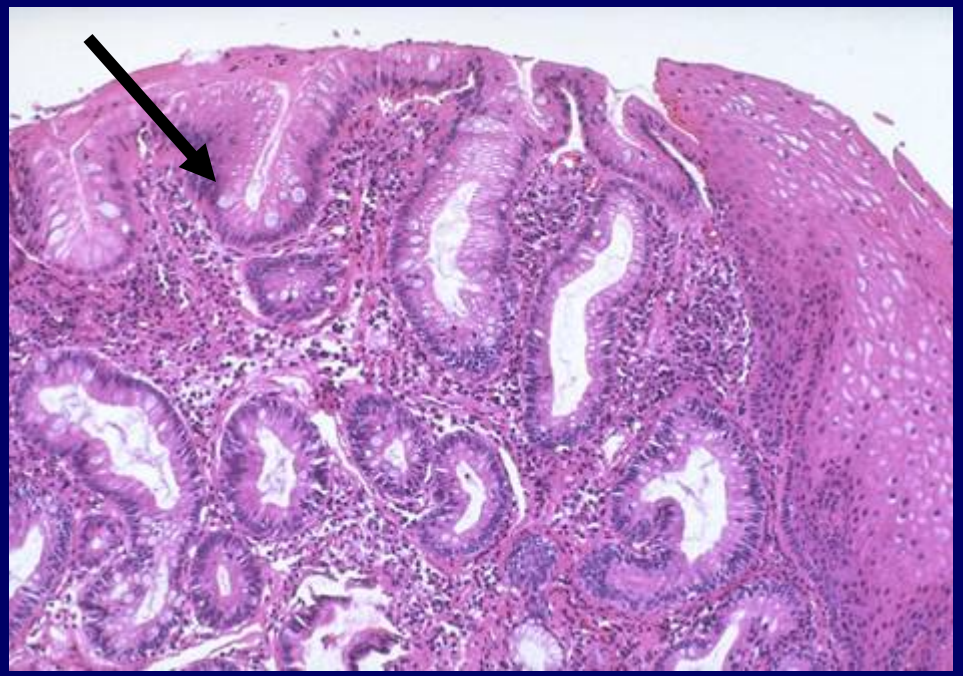
Diagnosis:

- endoscopic :
- areas of erythema (redness)
- normal esophagus is white-pale

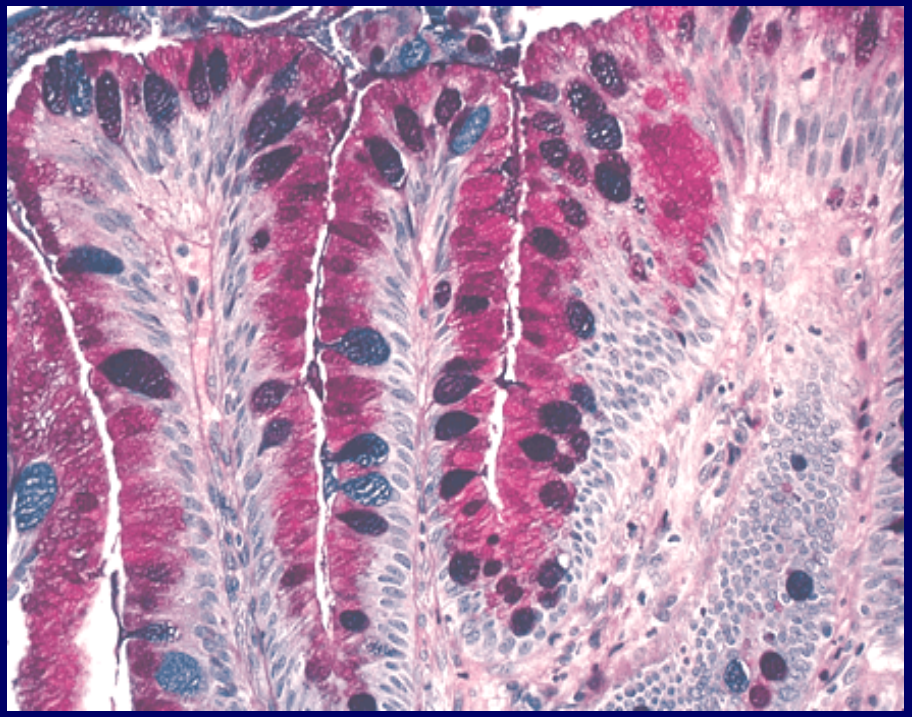
- histologic findings:

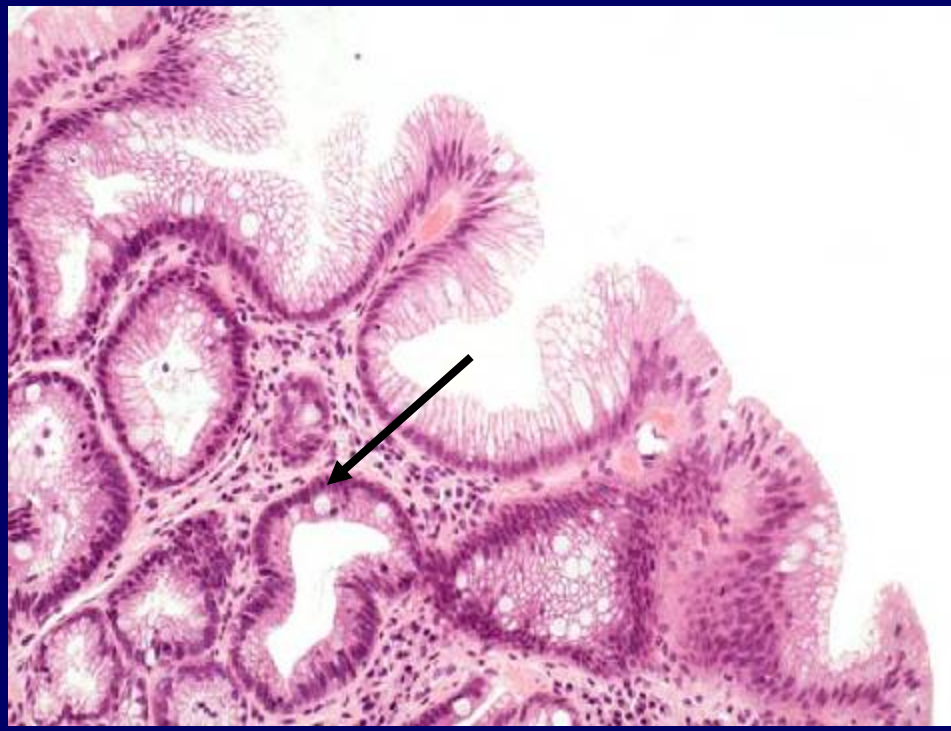
- replacement of squamous epithelium with intestinal type columnar epithelium, with goblet cells (mucin containing)





BARRETT'S ESOPHAGUS





Alcian blue/PAS - stains
goblet cells mucin in blue

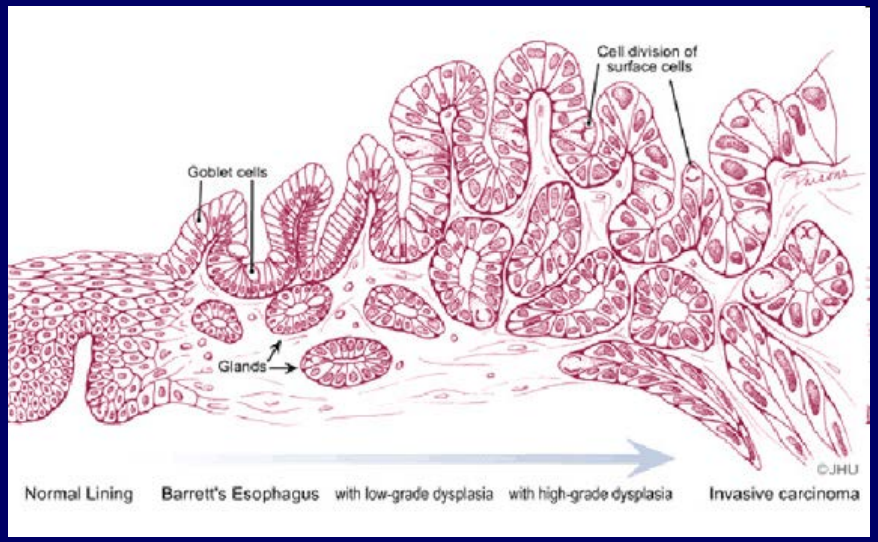
WHY IS BARRETT'S ESOPHAGUS IMPORTANT???

1. Develops in 10% of adults with chronic reflux

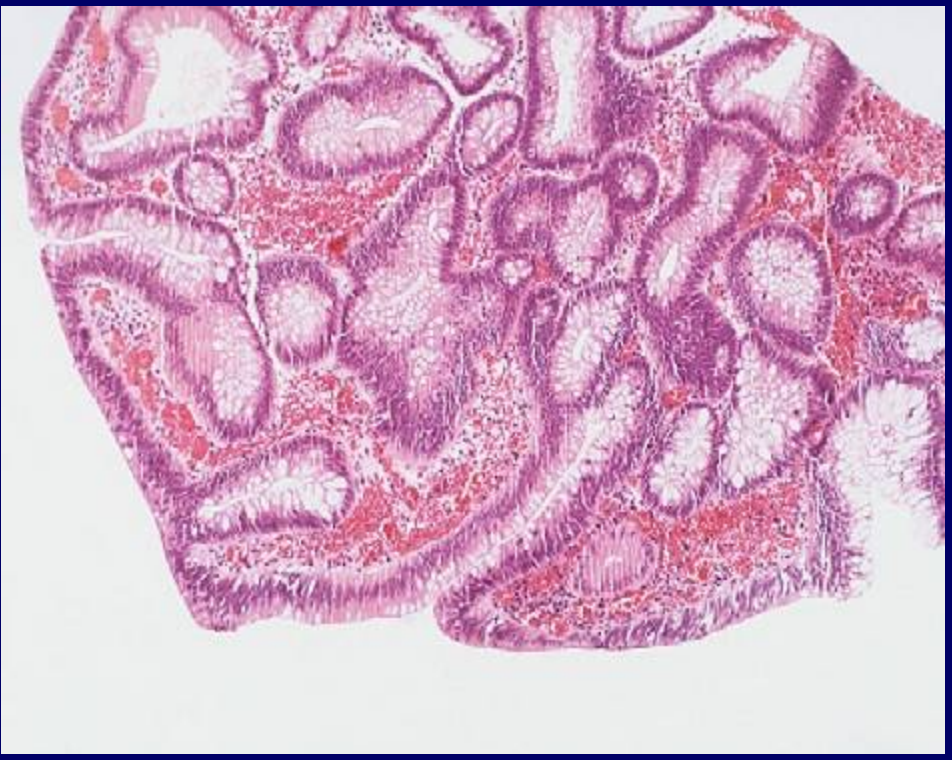
2. Results in a 30-40 fold increase in risk of esophageal adenocarcinoma (5% lifetime risk) ; High risk of adenocarcinoma if > 2 cm of Barrett mucosa

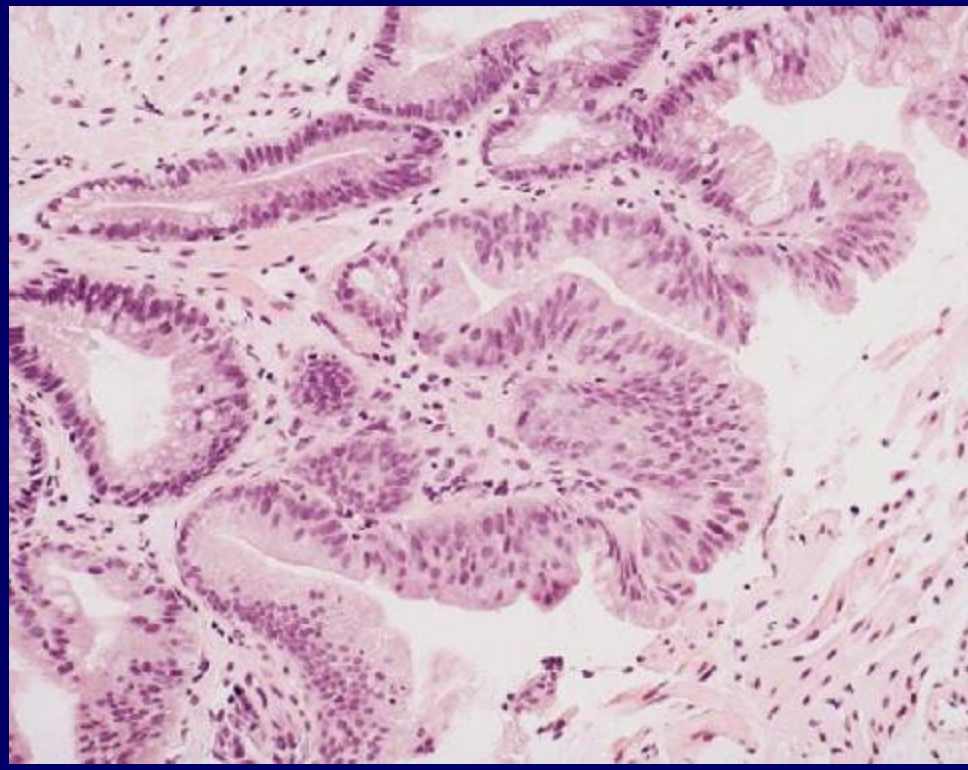
3. Steps to development of adenocarcinoma:

- low grade dysplasia
- high grade dysplasia
- carcinoma

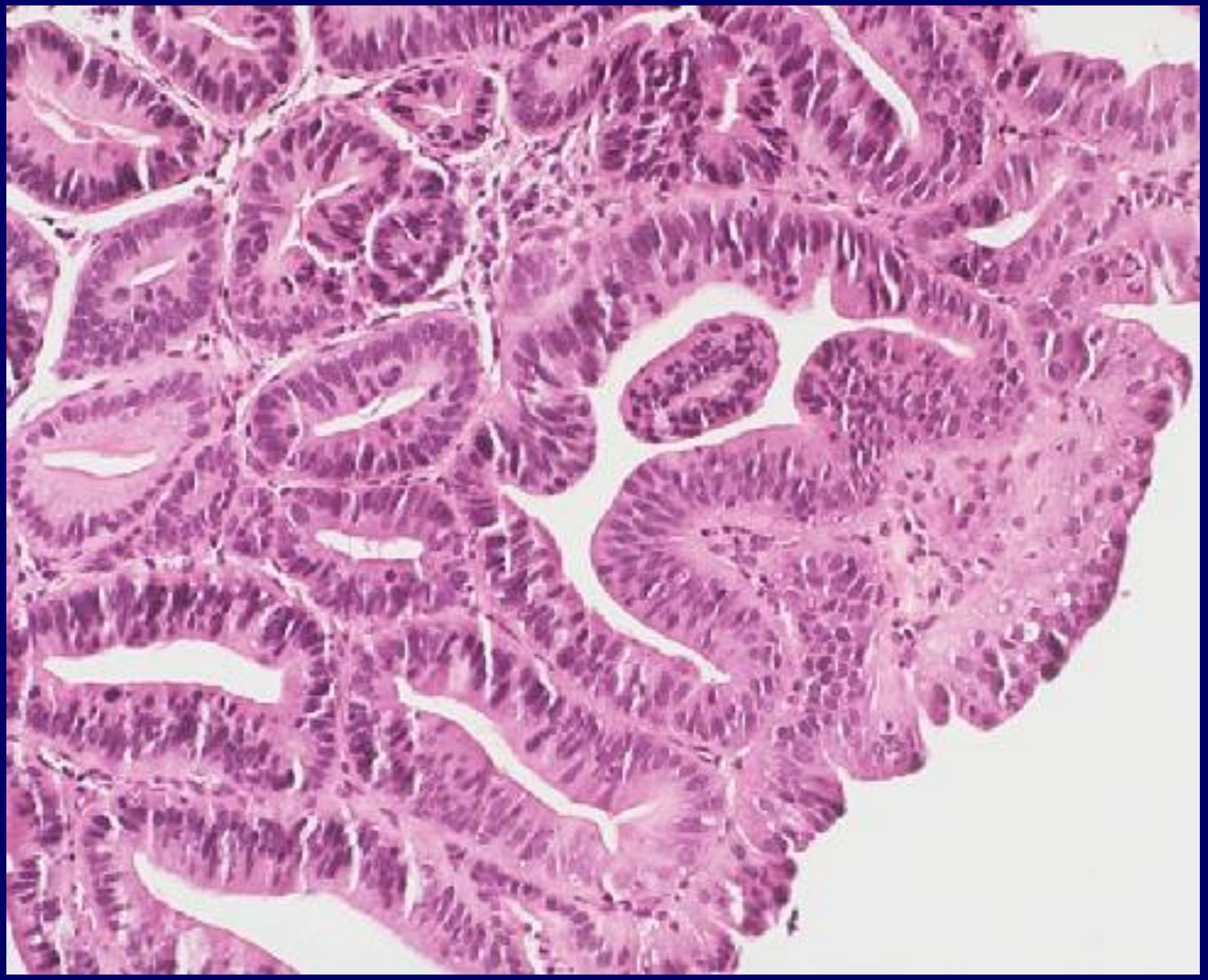


BARRETT'S ESOPHAGUS
low grade dysplasia





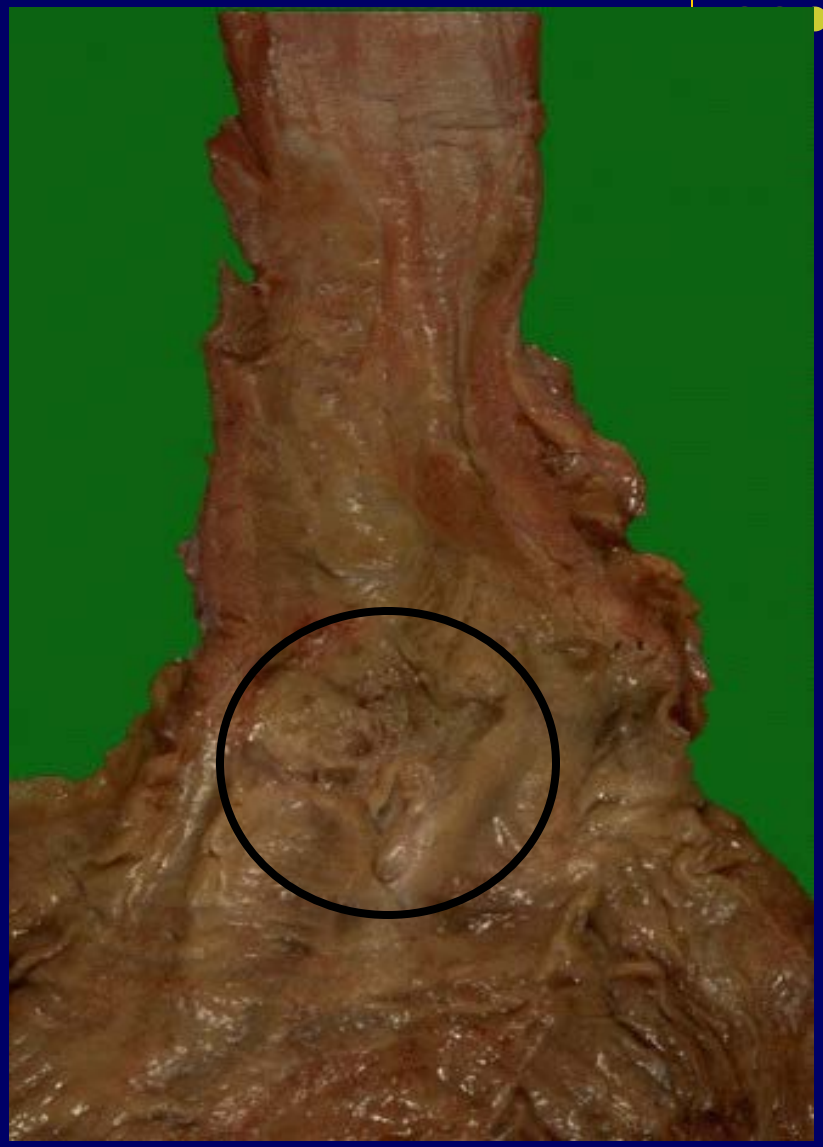
BARRETT'S ESOPHAGUS
high grade dysplasia



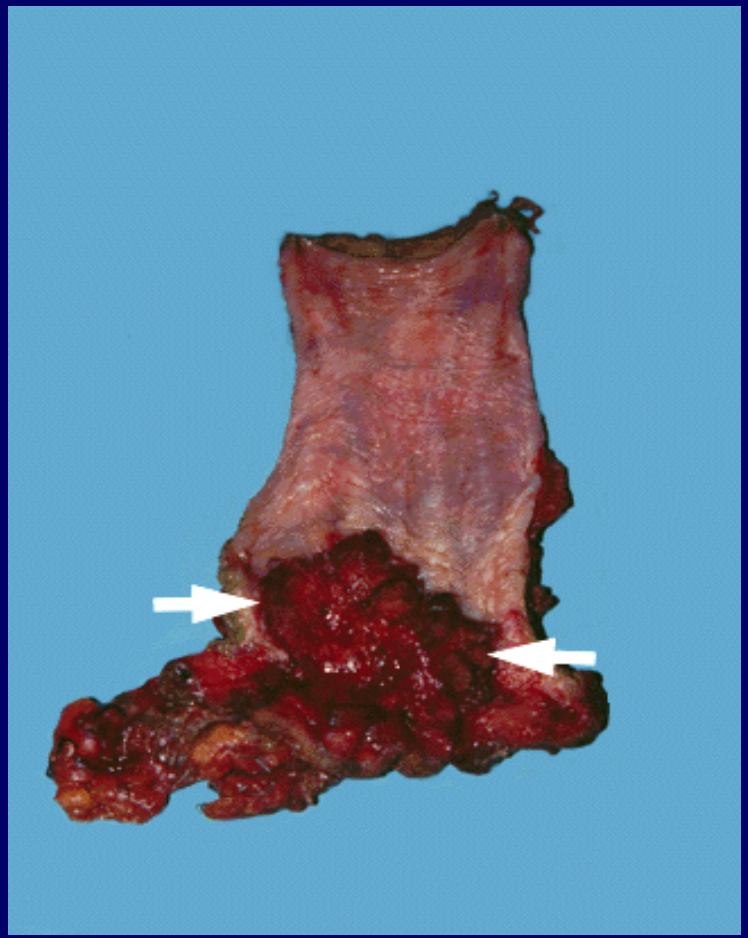
ESOPHAGUS
- ADENOCARCINOMA -

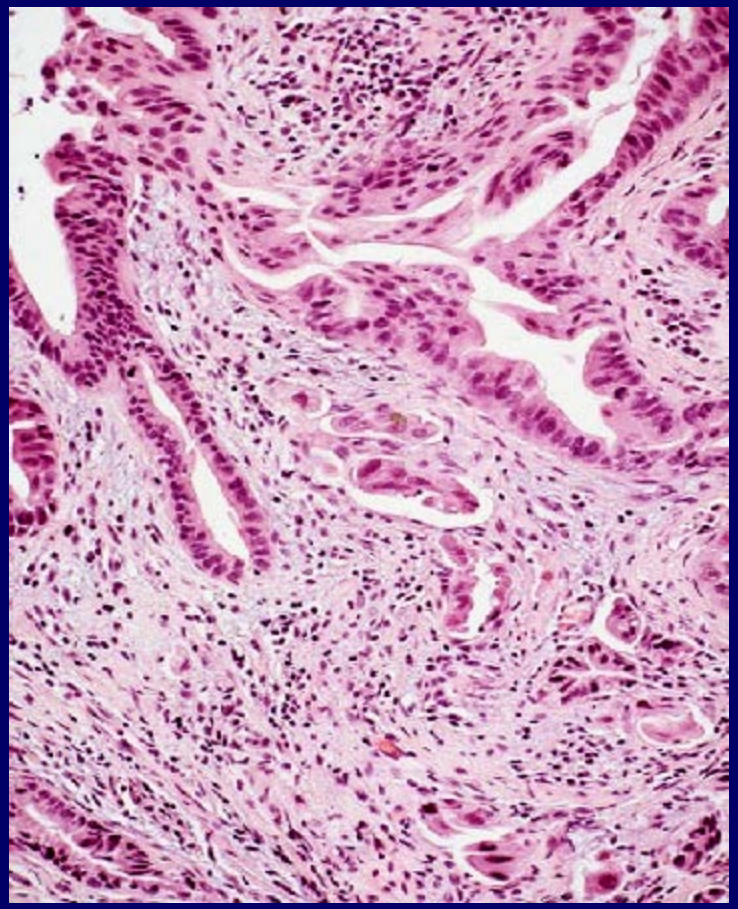
- 30-40% of primary esophageal cancers;
- Age 40- 50, usually white men
- Symptoms: none or gastroesophageal reflux disease
- Arises at GEJ
- 5 year survival 15-25%, up to 80% with superficial disease and resection

- 85% arise in setting of Barrett's esophagus; rarely arise from ectopic gastric mucosa in upper esophagus or from submucosal glands

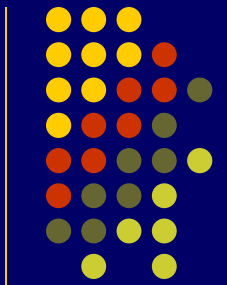


ESOPHAGUS
- ADENOCARCINOMA -



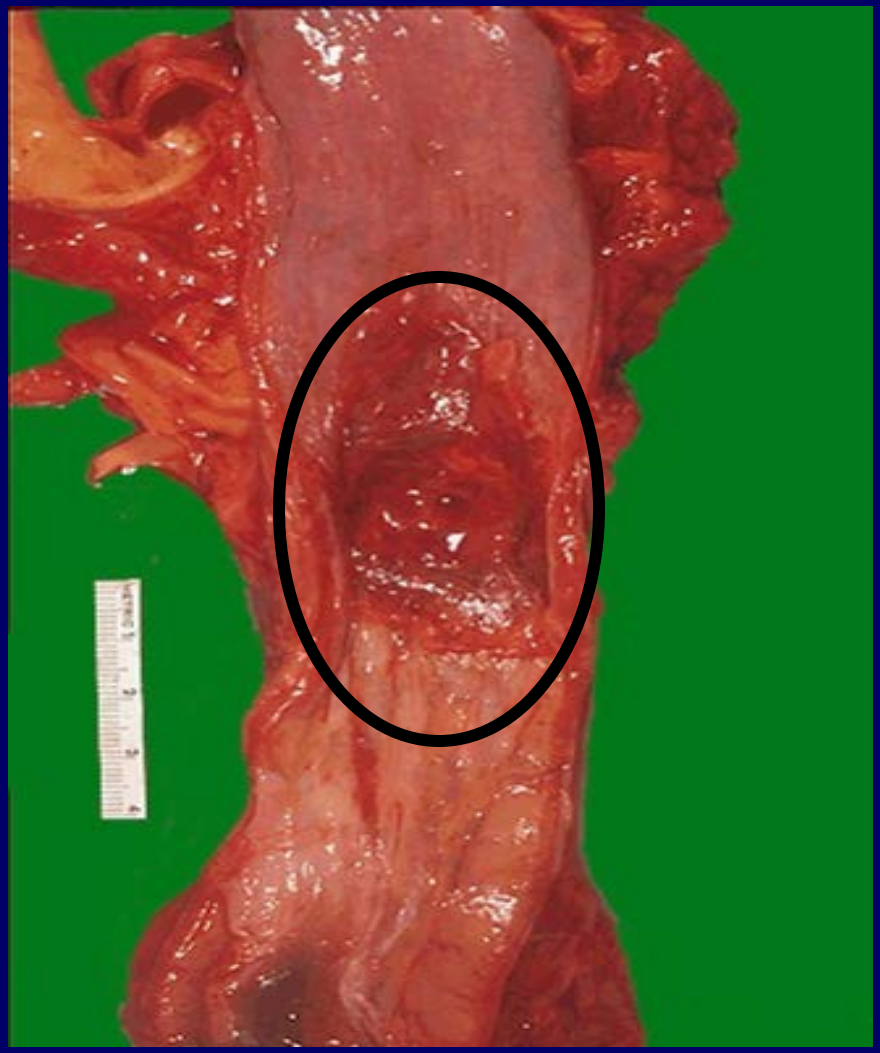


ESOPHAGUS
- SQUAMOUS CELL CARCINOMA -

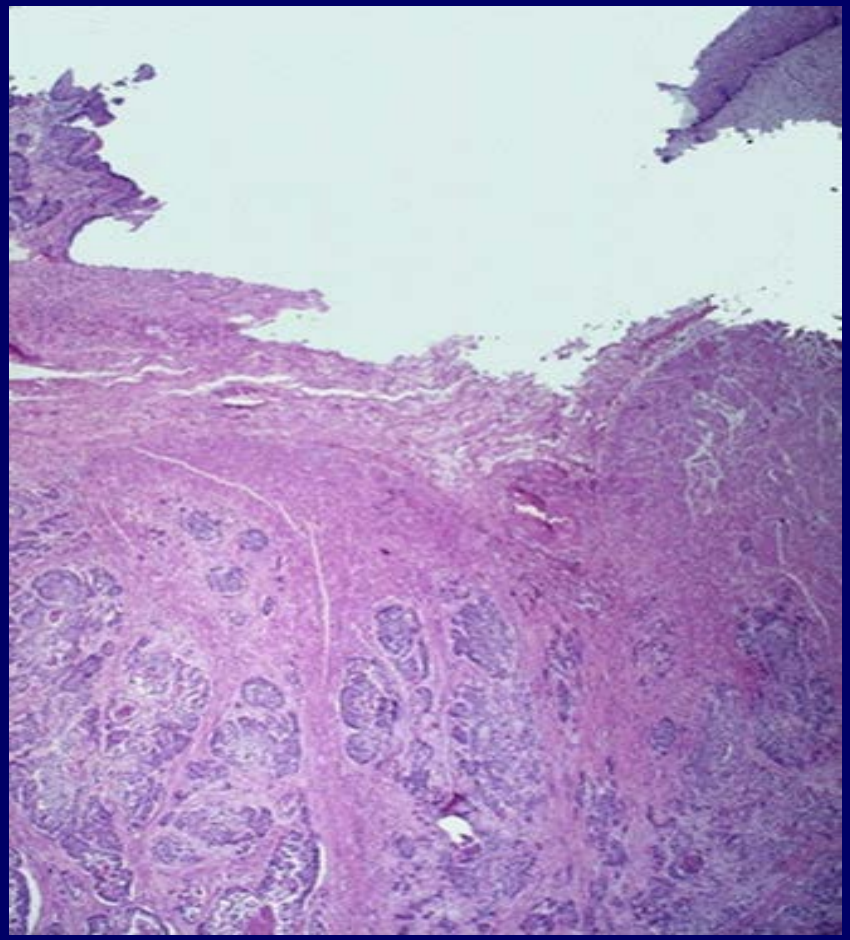


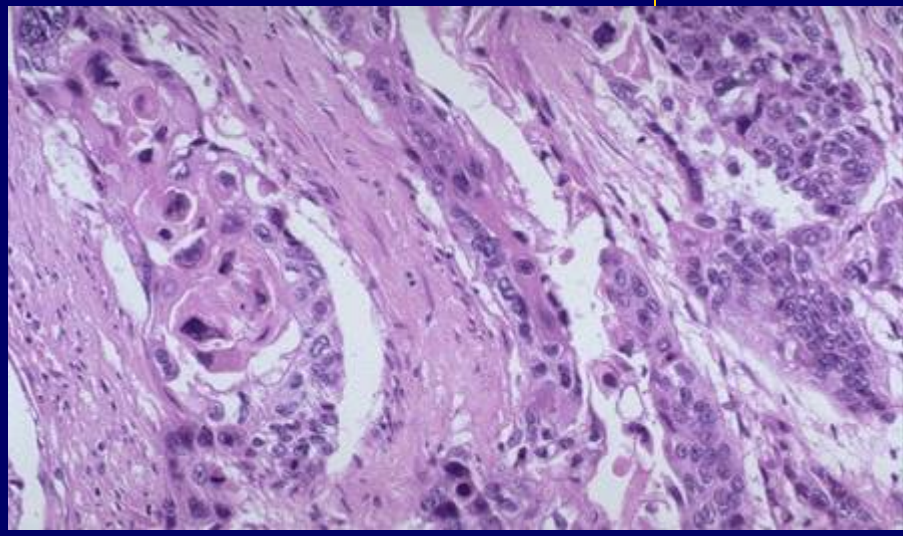
- Most common type of esophageal cancer
- **Causes:** alcohol, tobacco, urban environment
- Usually men age 50+ in low risk areas; more common in blacks (4:1) in US
- **Symptoms:** dysphagia, anorexia, weight loss (due to advanced stage at presentation)
- 90% in mid/lower esophagus
- Distant metastases to lungs, liver, bones, adrenal glands

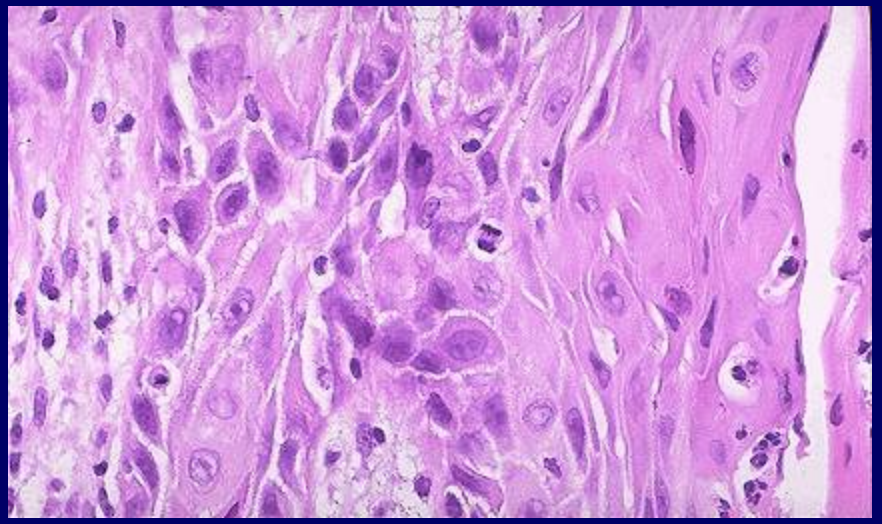
SQUAMOUS CELL CARCINOMA



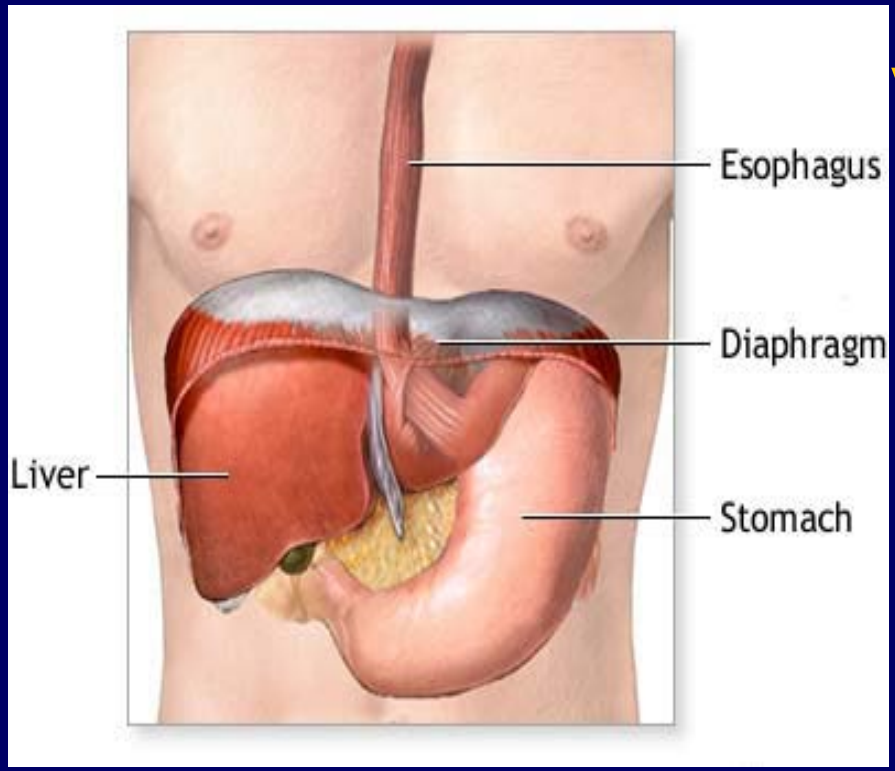
SQUAMOUS CELL CARCINOMA







STOMACH

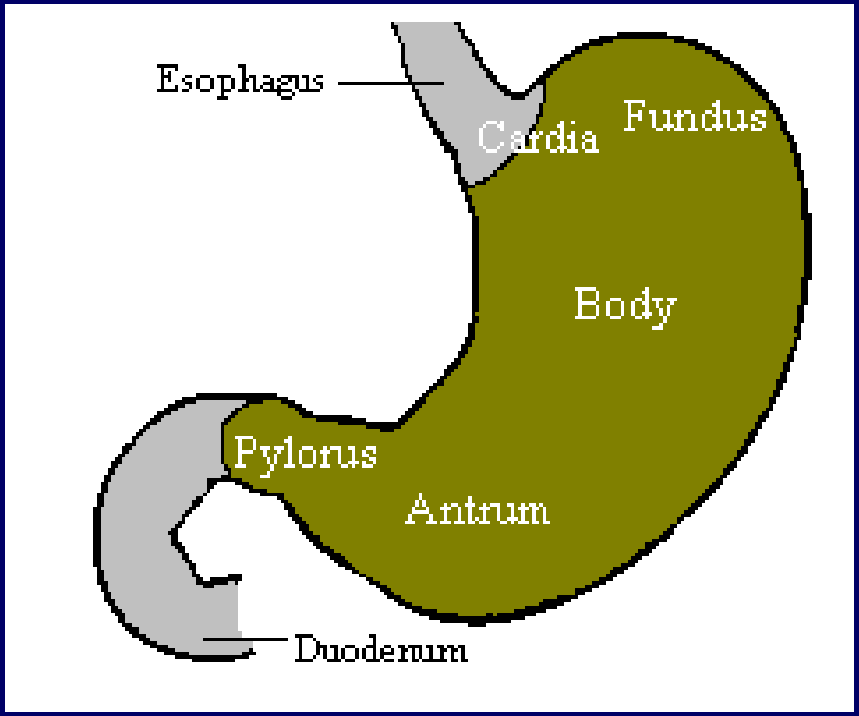


STOMACH

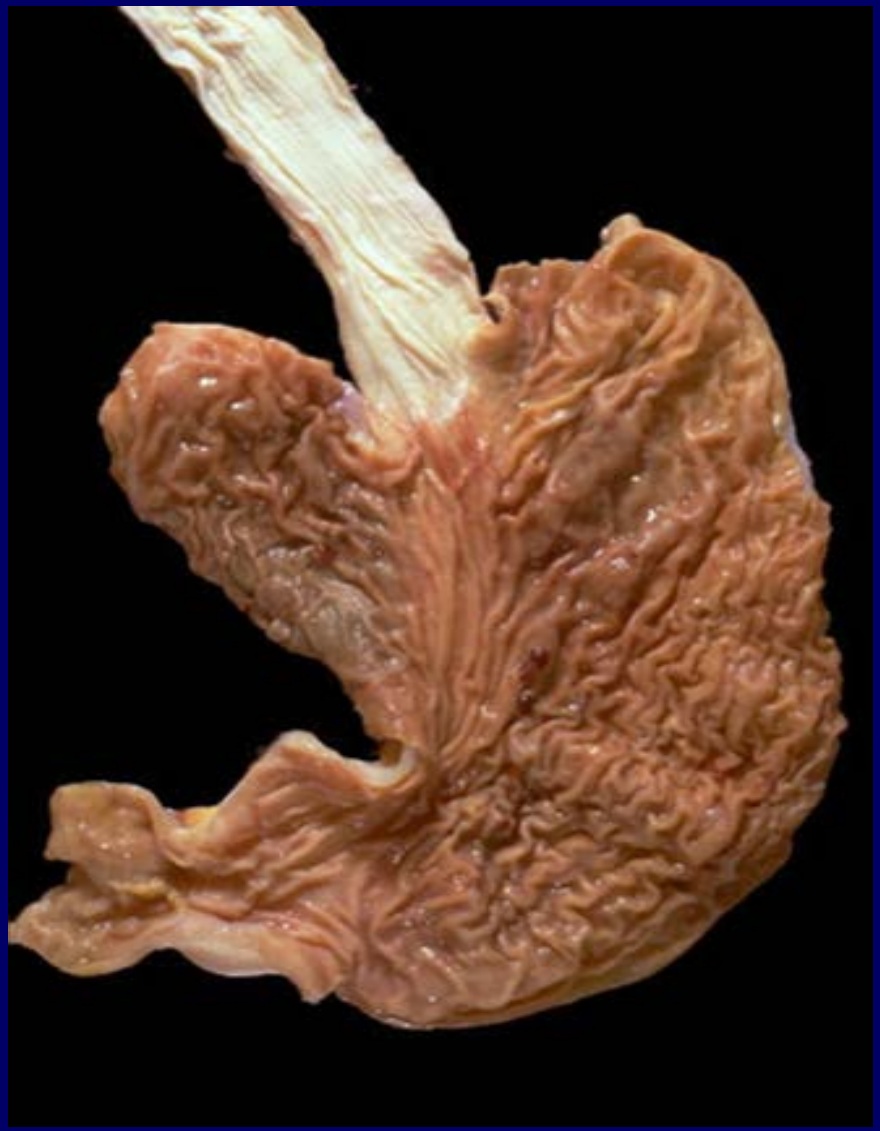
- The esophagus joins the stomach obliquely at the cardia (GEJ).

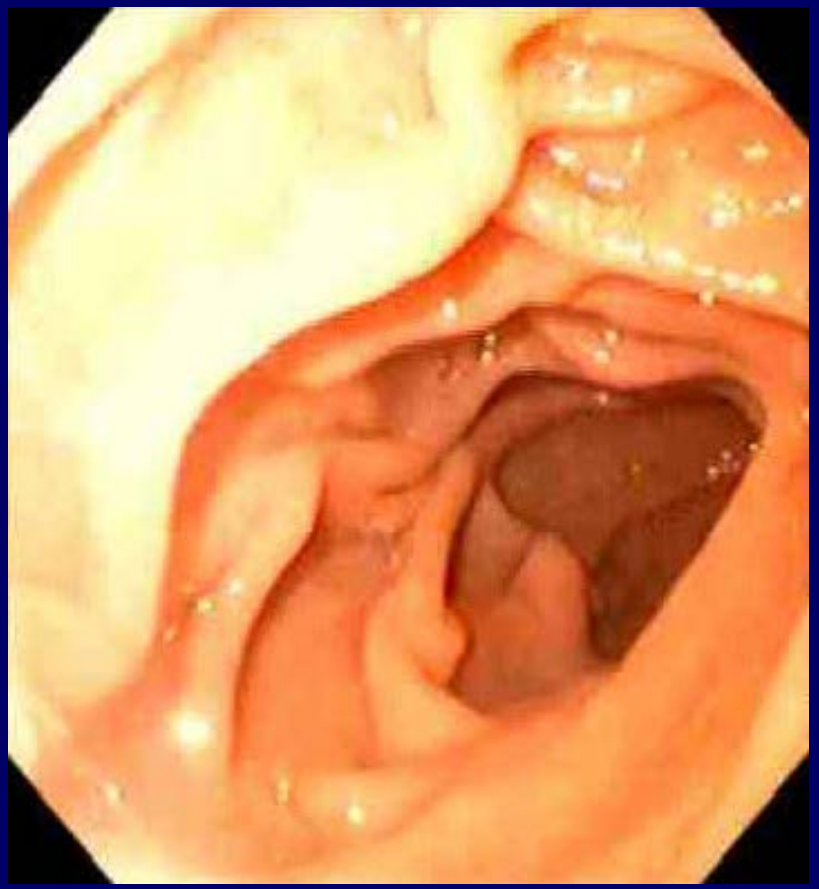
- The stomach is divided into the following parts:

- Cardia
- Fundus
- Body
- Antrum
- Pylorus



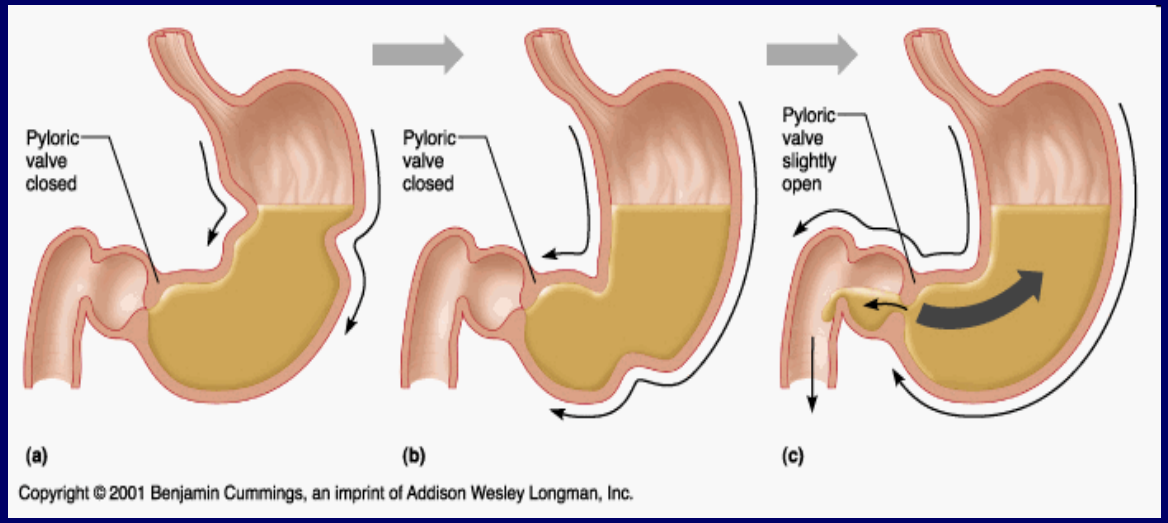
STOMACH
NORMAL GROSS APPEARANCE



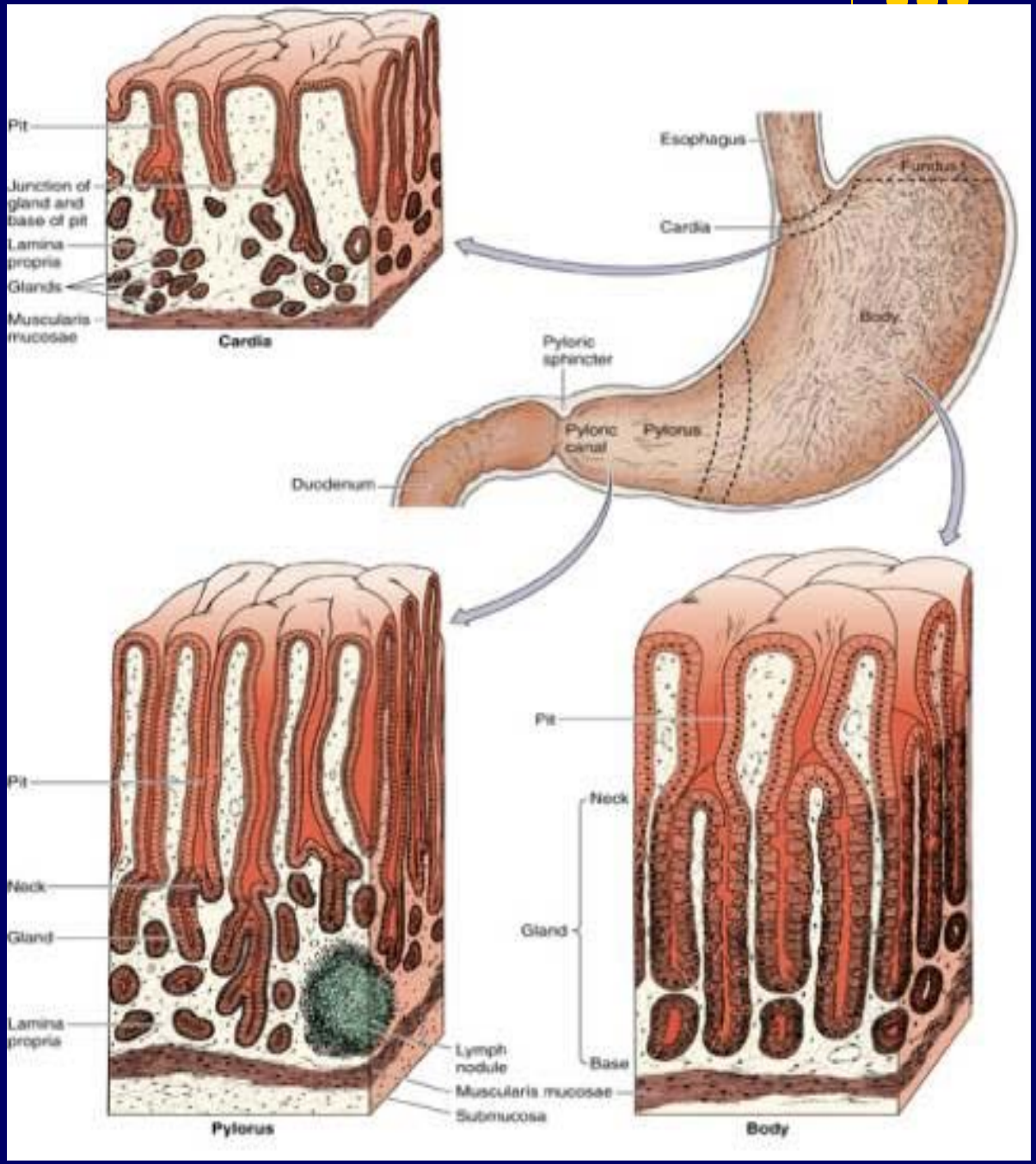


Stomach

- Chemical digestion
- Mechanical digestion
- Propulsion (gastric emptying)

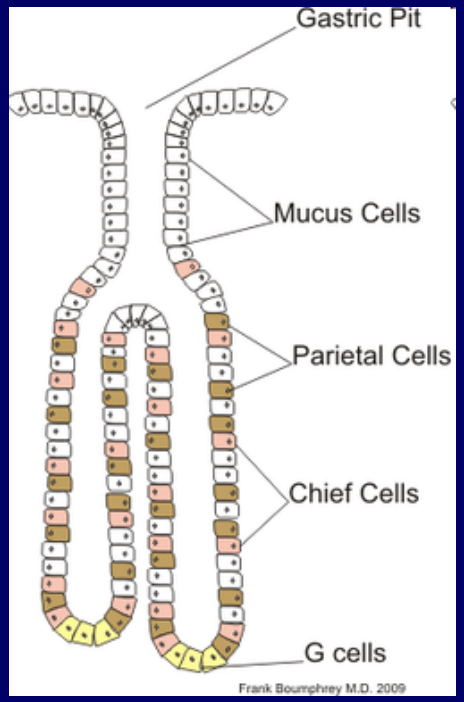


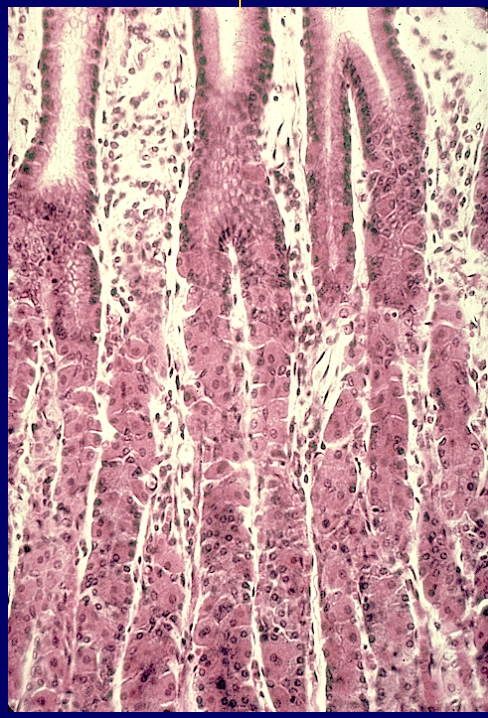
Stomach-normal histology



STOMACH – the cells

- **parietal or oxyntic cells** secrete hydrochloric acid and **intrinsic factor**, a substance essential for the absorption of **Vitamin B12** in the small intestine ;
- **peptic or chief cells** secrete pepsinogen(inactive) which in contact with acid converts it to the active form **pepsin** ;
- **mucous cells** secrete a bicarbonate rich mucous which protects the stomach from the Hydrochloric acid of the gastric juice ;
- **G cells** (found only in the antral glands) secrete the hormone Gastrin.





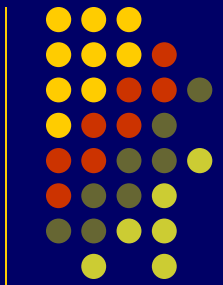
STOMACH - PATHOLOGY

- Inflammation of gastric mucosa - Gastritis
- Infections
- Peptic ulcer disease
- Polyps and polyposis syndromes
- Tumors: benign, malignant

GASTRITIS

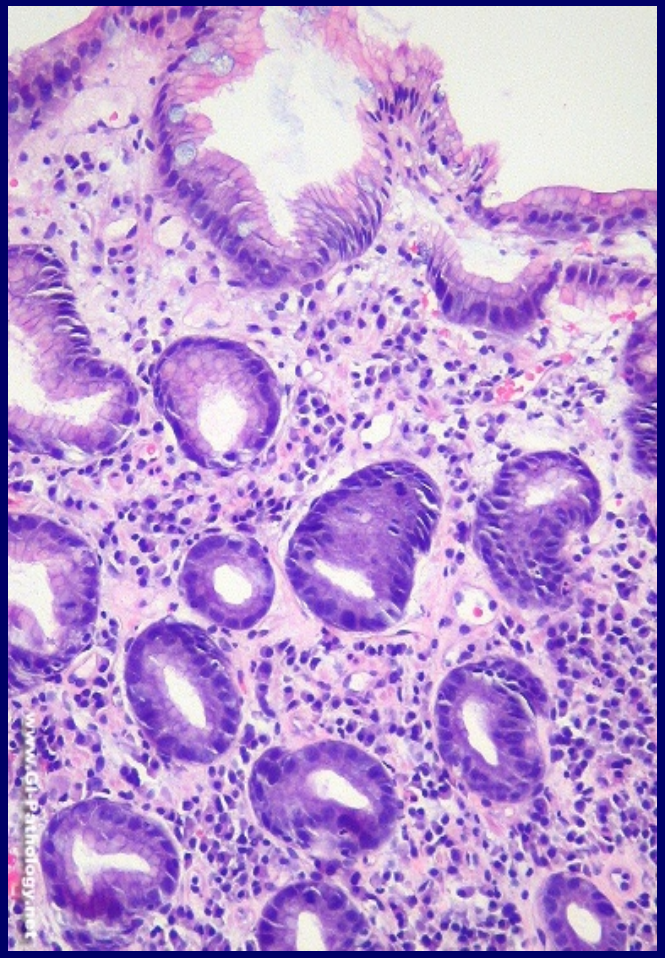
- **ACUTE GASTRITIS**
- **CHRONIC GASTRITIS:**
- *NONATROPHIC G:* - DIFFUSE ANTRAL CG, H.PYLORI RELATED
- *ATROPHIC G:* - AUTOIMMUNE ATROPHIC CG
  - MULTIFOCAL ATROPHIC CG
- *REACTIVE GASTROPATHY (CHEMICAL G)* :
  - NSAID
  - BILE REFLUX
  - VASCULAR GASTROPATHY

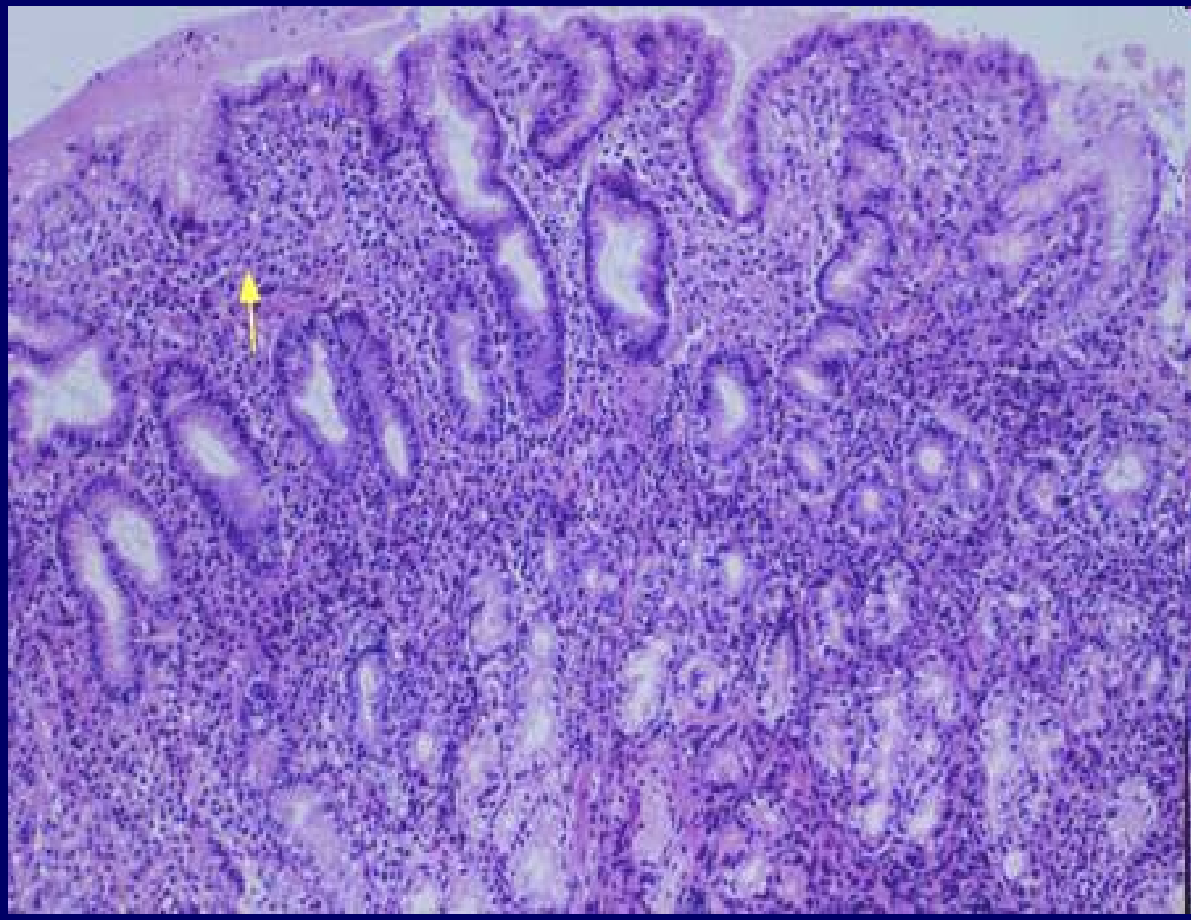
Chronic gastritis



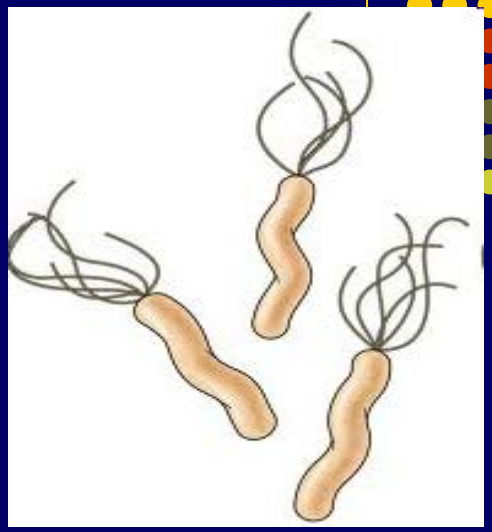
- Chronic mucosal inflammation leading to mucosal atrophy and intestinal metaplasia, usually without erosions
- *The epithelial changes may become dysplastic and constitute a background for the development of carcinoma* (low grade dysplasia-high grade dysplasia-carcinoma sequence)
- Most cases are non-autoimmune gastritis (non-atrophic)
- Associated with chronic Helicobacter pylori infection, toxins (alcohol, tobacco), reflux of bilious duodenal secretions (post-antrectomy or other), obstruction (bezoars, atony), radiation
- Incidence increases with age

CHRONIC GASTRITIS – H.pylori related





H pylori gastritis -diagnosis



- Non invasive:
- blood antibody test
- stool antigen test
- carbon urea breath test (in which the patient drinks 14C- or 13C-labelled urea, which the bacterium metabolizes, producing labelled carbon dioxide that can be detected in the breath)
- urine ELISA test (96% sensitivity , 79% specificity)

- Invasive: a biopsy during endoscopy- gold standard

- HELICOBACTER PYLORI- Gram negative short spiraled bacilli arranged in groups within the mucus

- It was identified in 1982 by Barry Marshall and Robin Warren (they won Nobel prize)

- H.Pylori plays a critical role in :

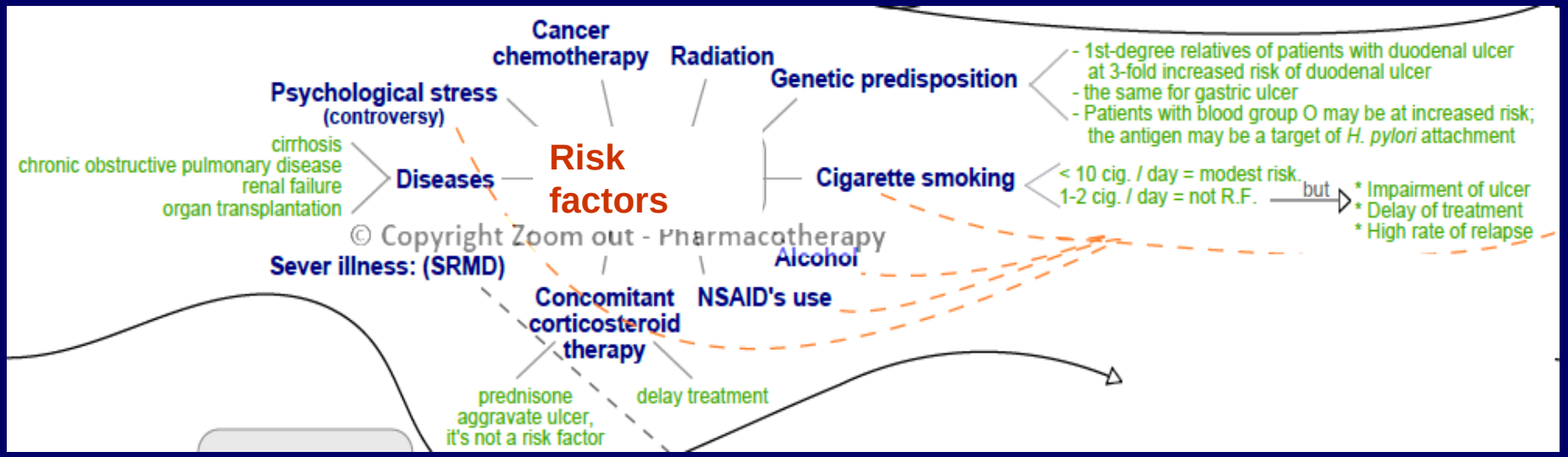
- Chronic gastritis
- Peptic ulcer disease
- Gastric carcinoma (risk 2% to 4%)
- Gastric MALT lymphoma

H pylori gastritis

- To colonize the stomach, *H. pylori* must survive the acidic pH of the lumen and use its flagella to burrow into the mucus to reach its niche
- Swims away from the acidic contents of the lumen towards the more neutral pH environment of the epithelial cell surface
- *H. pylori* produces large amounts of the enzyme urease, which breaks down urea (which is normally secreted into the stomach) to carbon dioxide and ammonia. The ammonia is converted to ammonium by accepting a proton (H+), which neutralizes gastric acid. The ammonia produced is toxic to the epithelial cells

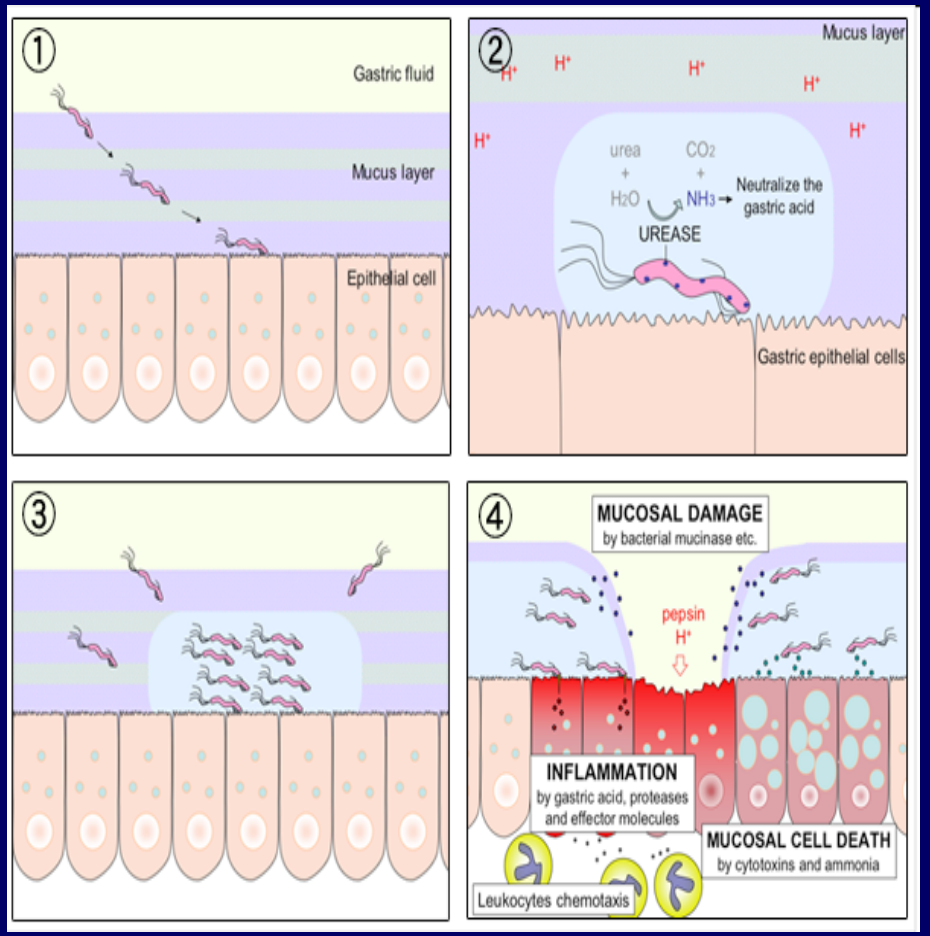
Peptic ulcer disease

- Colonization of the stomach by *H. pylori* results in chronic gastritis.
- Duodenal and stomach ulcers result when acid and pepsin in the stomach lumen overwhelm the protective mechanisms.
- The acidity within the stomach lumen affects the colonization pattern of *H. pylori*, and therefore ultimately determines whether a duodenal or gastric ulcer will form.



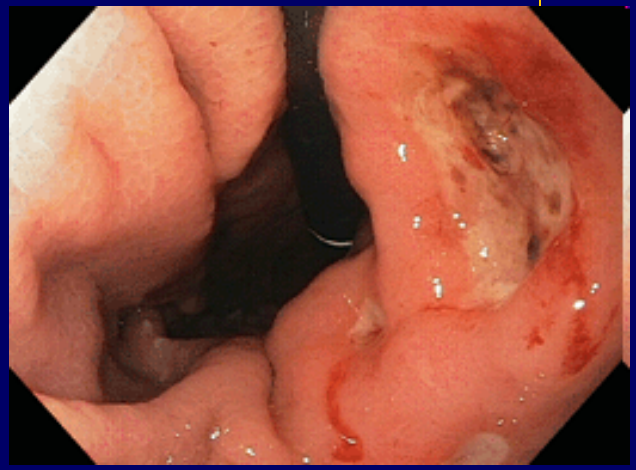
Pathophysiology

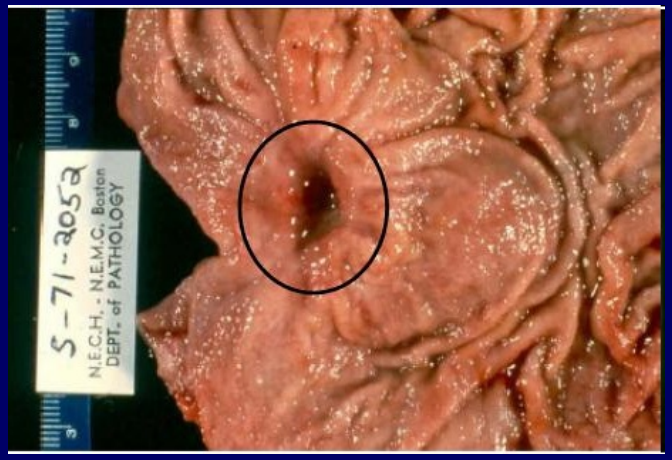
- Physiologic balance - between gastric acid secretion and gastroduodenal mucosal defense.
- Mucosal injury and peptic ulcer occur when the balance between the aggressive factors and the defensive mechanisms is disrupted.
- **Aggressive factors:** NSAIDs, *H pylori* infection, alcohol, bile salts, acid, and pepsin, can alter the mucosal defense by allowing back diffusion of hydrogen ions and subsequent epithelial cell injury.
- **The defensive mechanisms**: tight intercellular junctions, mucus, mucosal blood flow, cellular restitution, and epithelial renewal.



Peptic ulcer disease

- Epigastric pain is the most common symptom of both gastric and duodenal ulcers.
- Burning sensation and occurs after meals—classically, shortly after meals with gastric ulcer and 2-3 hours afterward with duodenal ulcer.
- Upper GI endoscopy is the preferred diagnostic test
- Endoscopy - visualize the ulcer, biopsy, to determine presence and degree of active bleeding and presence of malignancy





GASTRIC NEOPLASMS

BENIGN:

- POLYPS
  - HYPERPLASTIC
  - INFLAMMATORY
  - HAMARTOMATOUS
  - HETEROTOPIC
  - EPITHELIAL
  - NONEPITHELIAL

MALIGNANT:

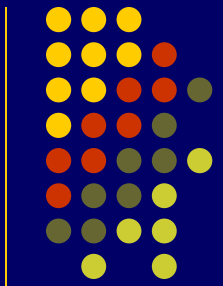
- ADENOCARCINOMA - INTESTINAL TYPE
  - DIFFUSE TYPE

- MESENCHYMAL TUMORS – GIST, leimyoma,leimoyosarcoma
- LYMPHOID TUMORS

GASTRIC CARCINOMA

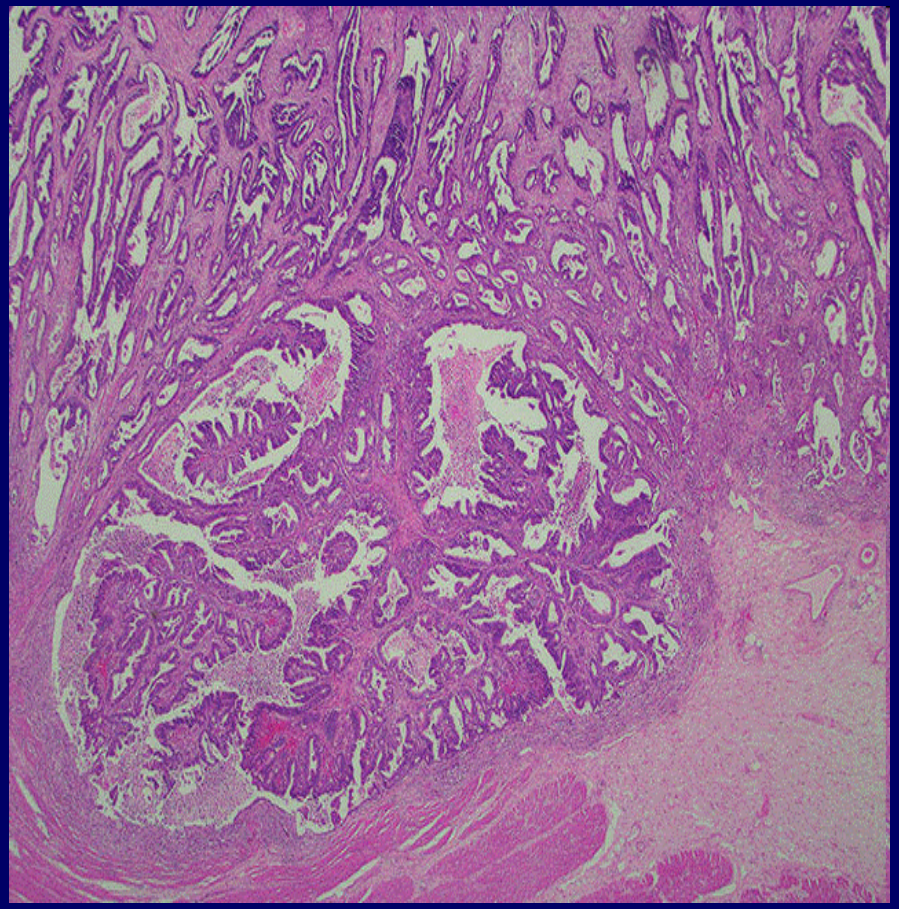
- Overall incidence declining due to lower rates of intestinal type; diffuse rates unchanged
- High incidence in Japan, Chile, Italy, China, Portugal, Russia; kills more people worldwide than lung cancer
- Japan: mass endoscopy programs led to 35% early gastric cancers vs. 10% in US
- Site: pylorus and antrum > cardia; lesser > greater curvature
- Depth of invasion most important prognostic factor

GASTRIC CARCINOMA

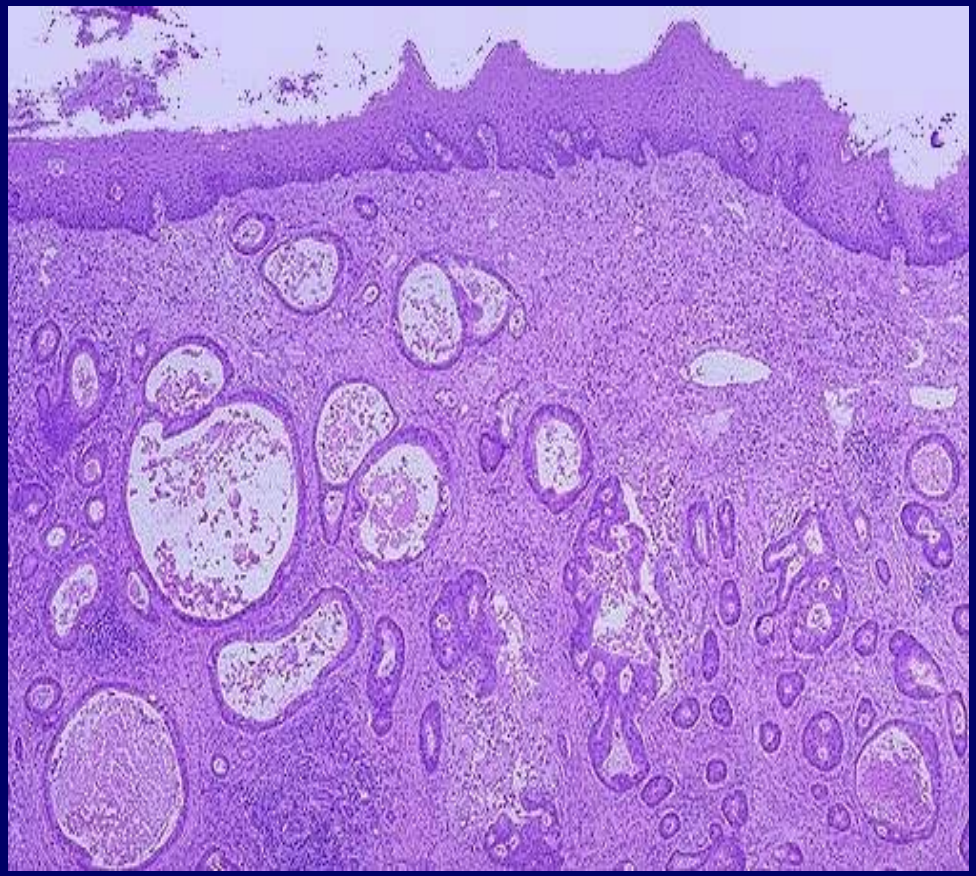


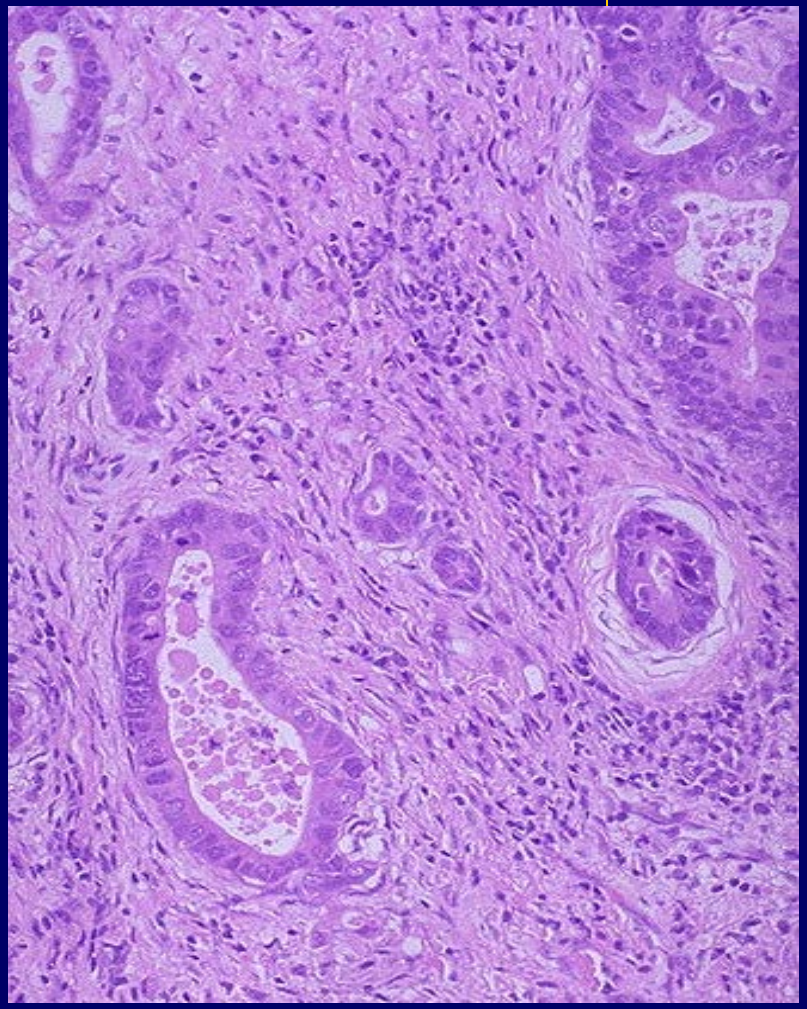
- 2/3 men; associated with lower socioeconomic groups
- 5 year survival - 20% or less; 95% for surgically treated early gastric carcinoma
- Usually asymptomatic until late; weight loss, abdominal pain, nausea, vomiting, altered bowel habits
- Two types: intestinal type and diffuse type (signet ring carcinoma)

1. GASTRIC ADENOCARCINOMA - INTESTINAL TYPE

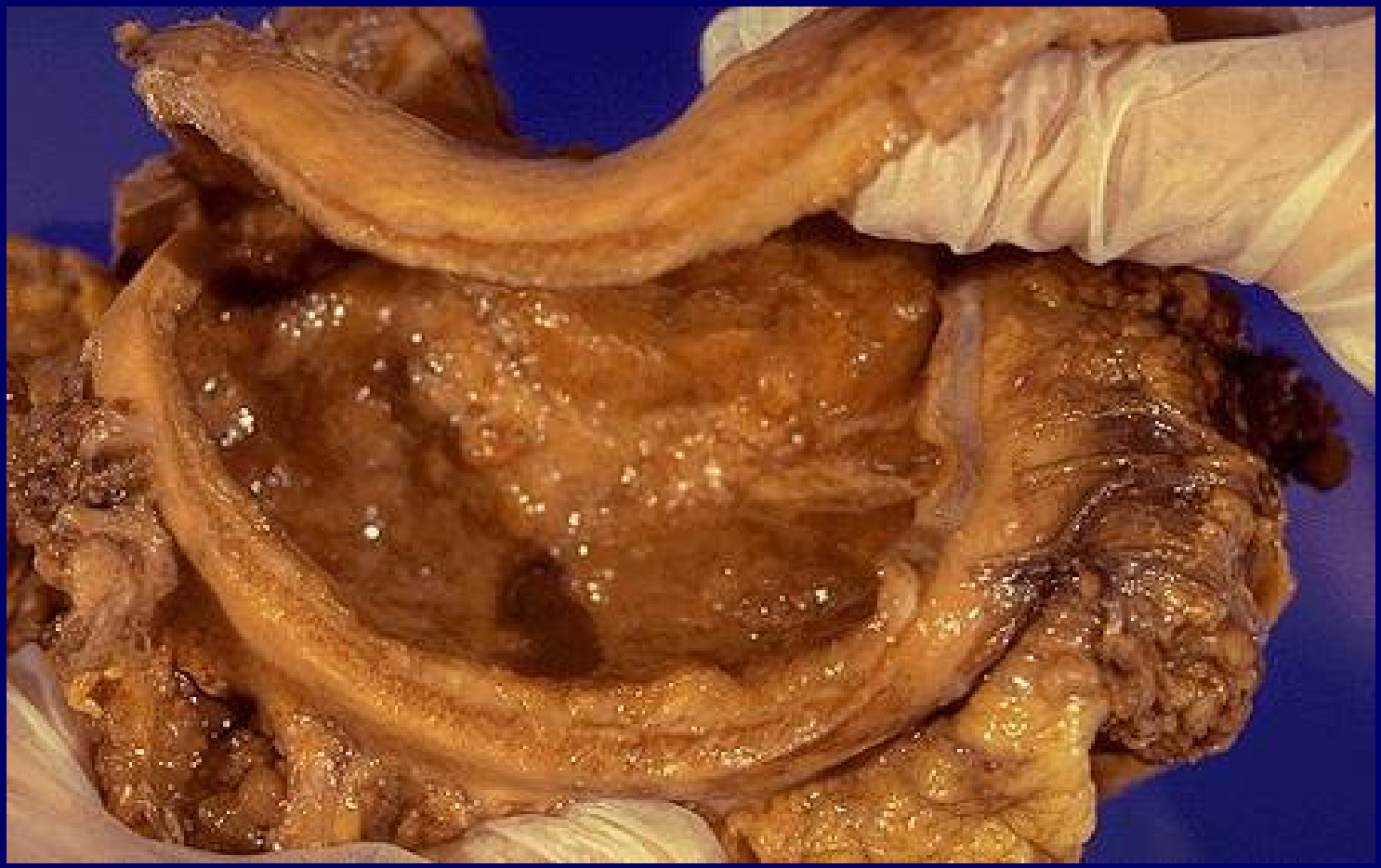


GASTRIC ADENOCARCINOMA
- INTESTINAL TYPE -

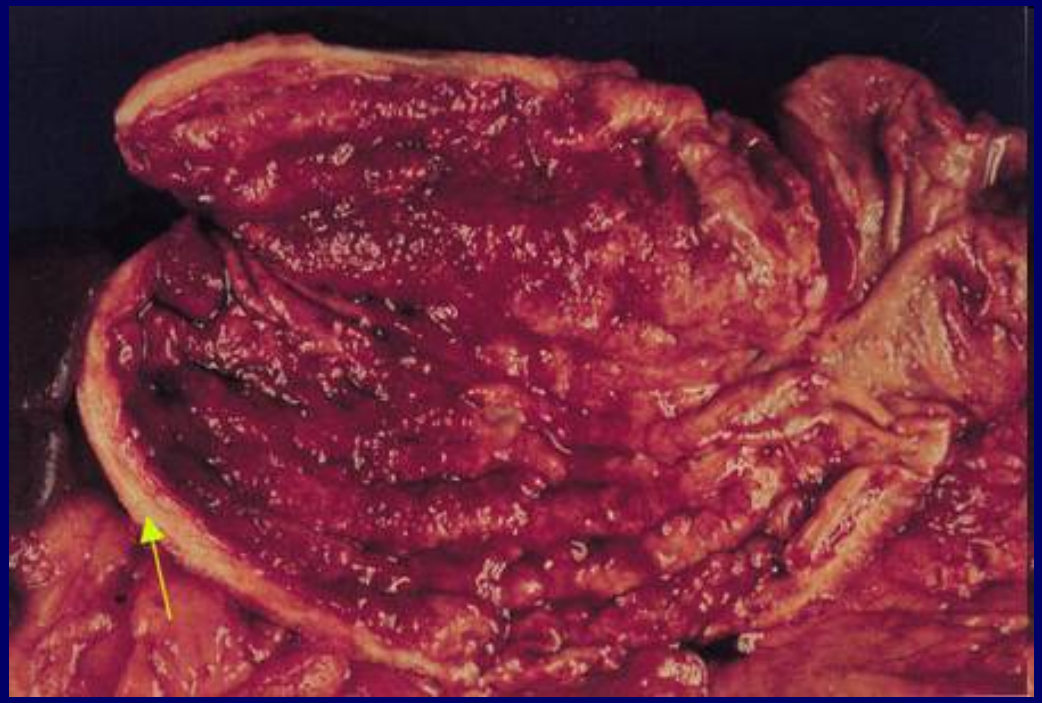


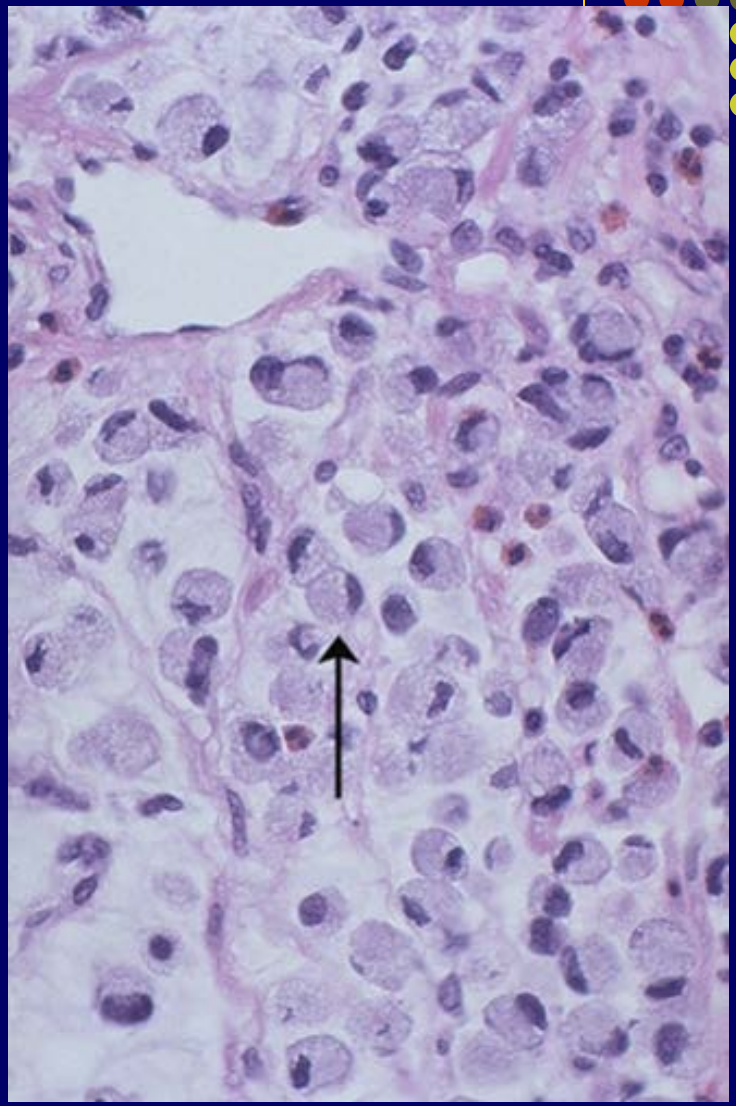


2. GASTRIC CARCINOMA - DIFFUSE TYPE (LINITIS PLASTICA, SIGNET RING CELL CARCINOMA)



GASTRIC CARCINOMA
- DIFFUSE TYPE -

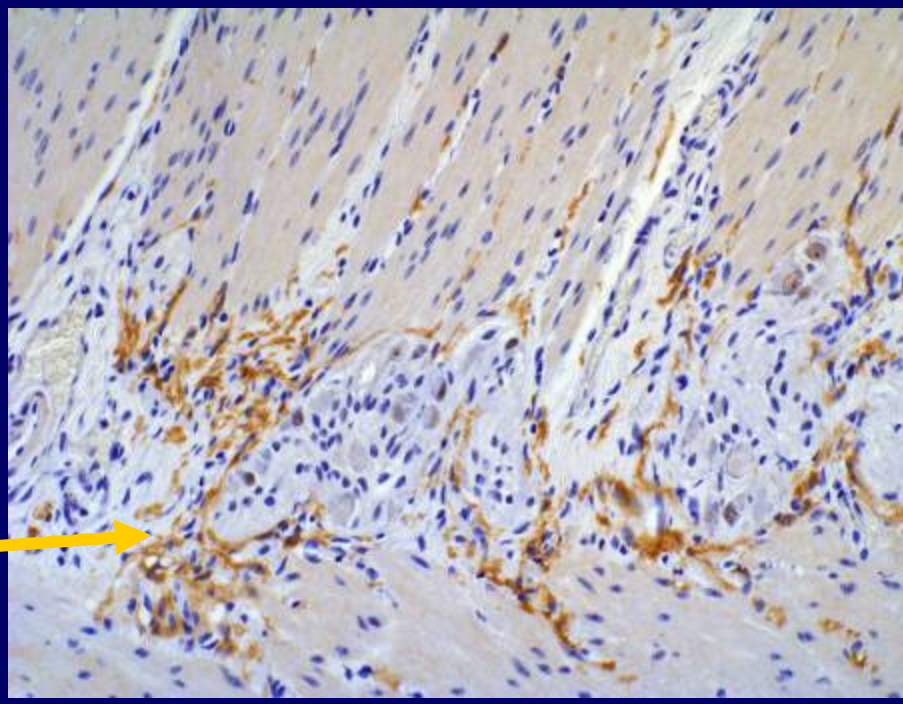




Mesenchymal Tumors

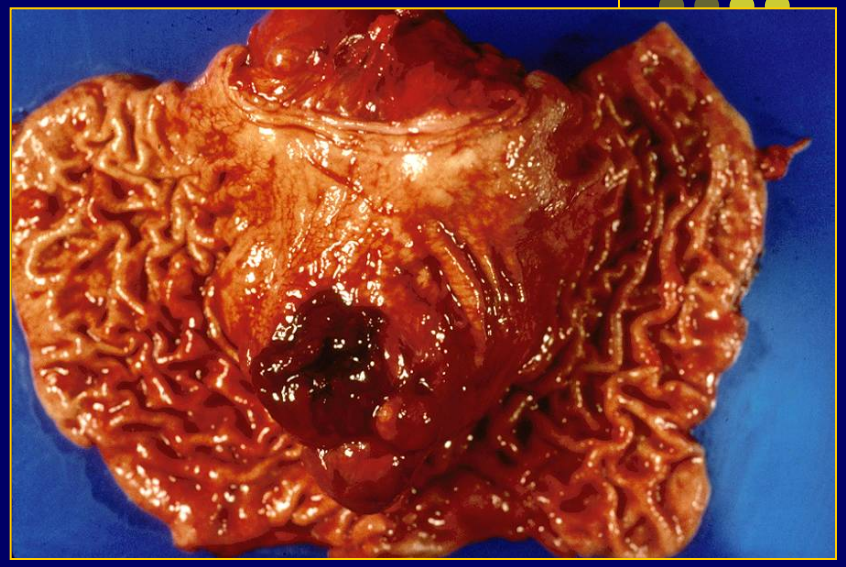
- Mesenchymal tumors
  - Originate from smooth muscle cells, nerves, vessels, fibroblasts and interstitial cells of Cajal (ICC)

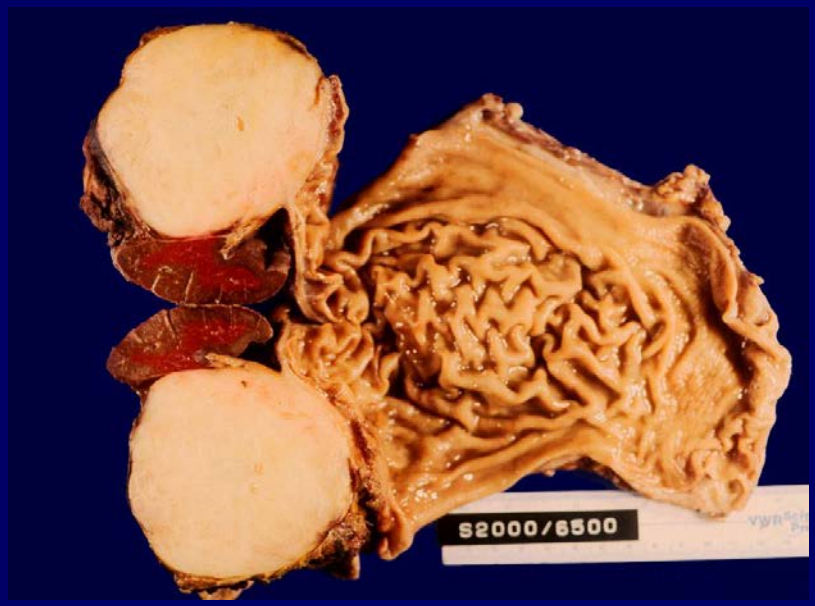
- Smooth muscle origin: leiomyoma (benign) or leiomyosarcoma (malignant)
- GIST arise from ICC

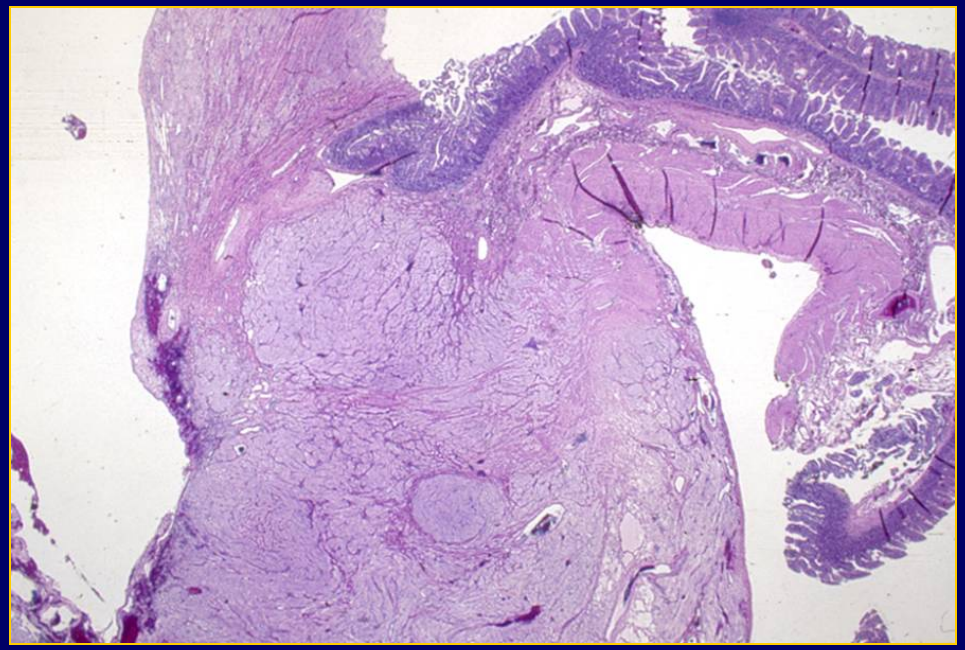


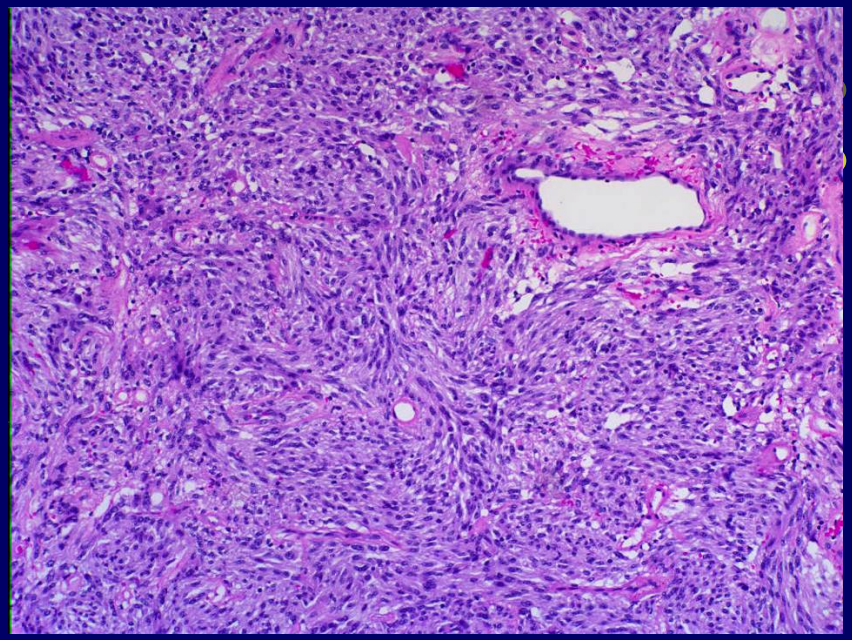
GIST (gastrointestinal stromal tumor)

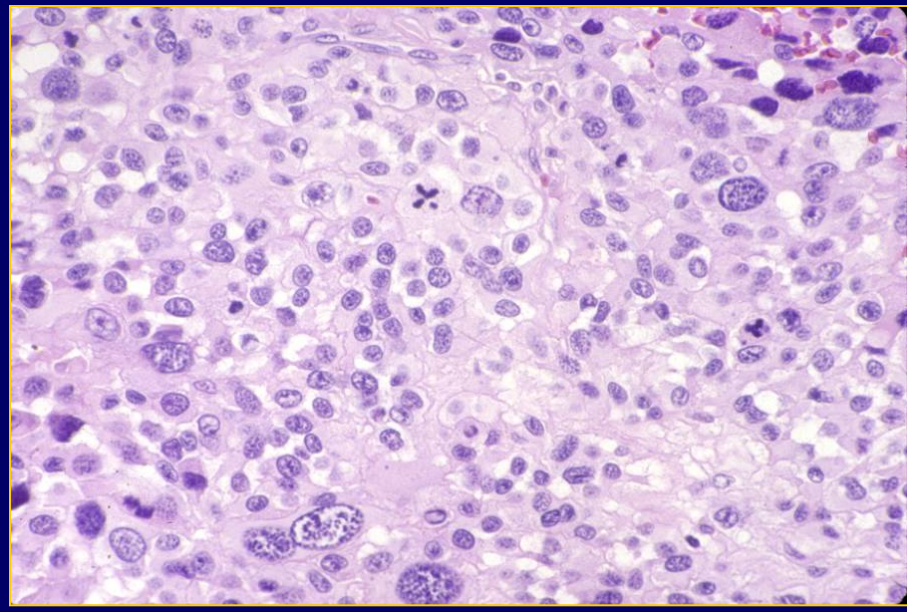
- Rare tumor
- Stomach - most common site
- Can be small, with a benign behavior
- Can be large, with necrosis and marked cytologic atypia, with malignant behavior



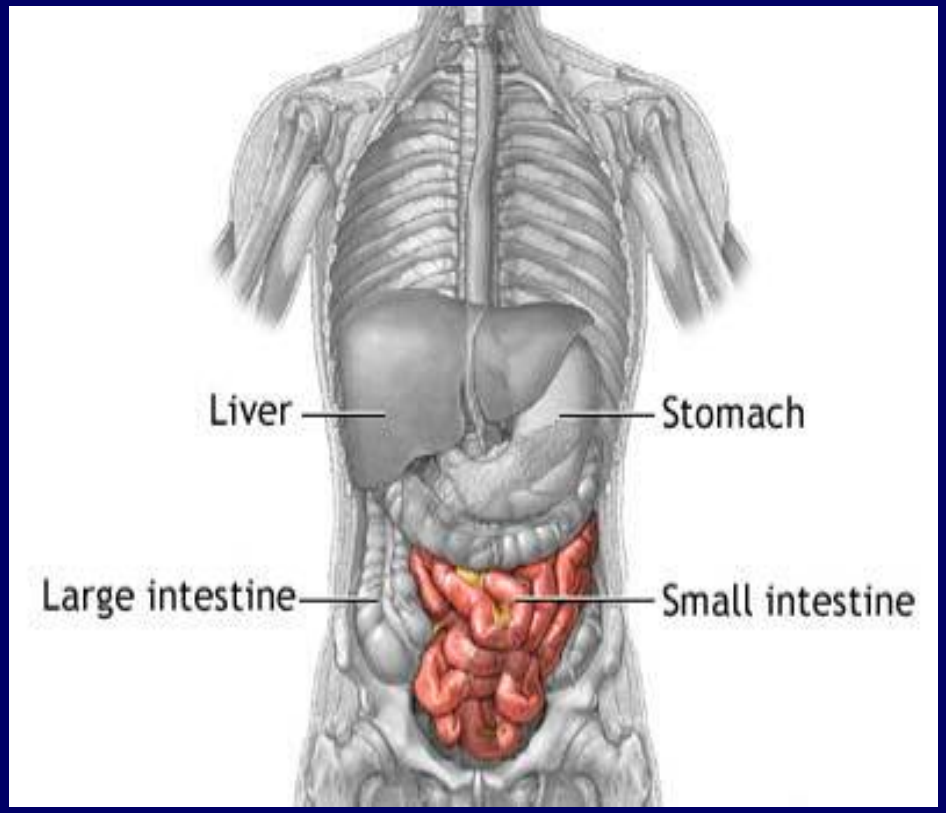








SMALL INTESTINE



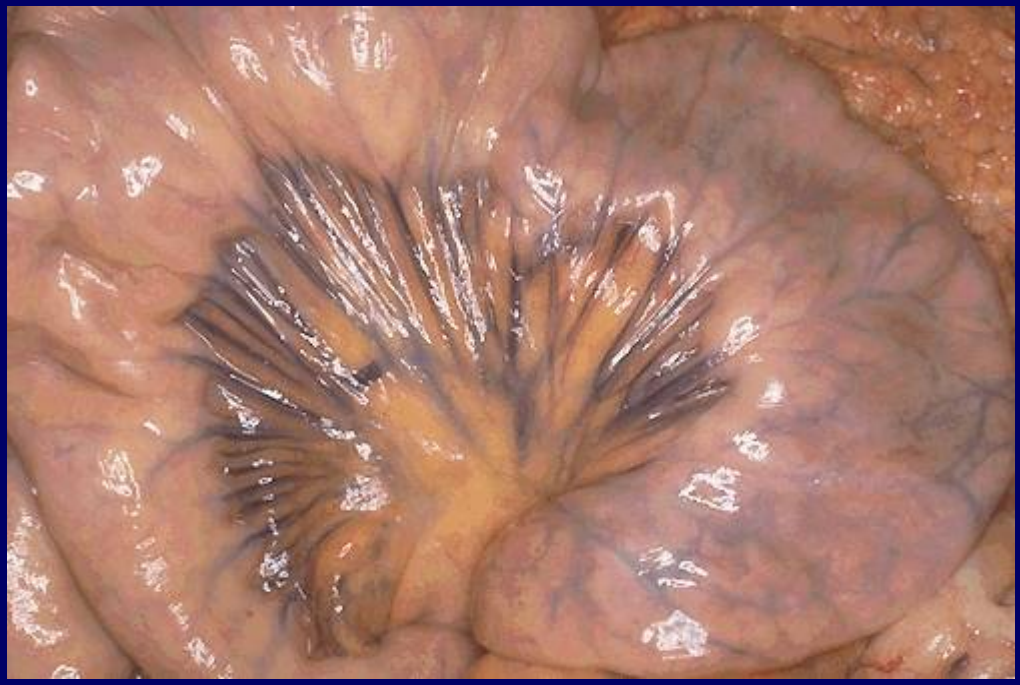
SMALL INTESTINE

- the major site of digestion and absorption
- 6 meters long, divided into:

1. Duodenum: 25 cm

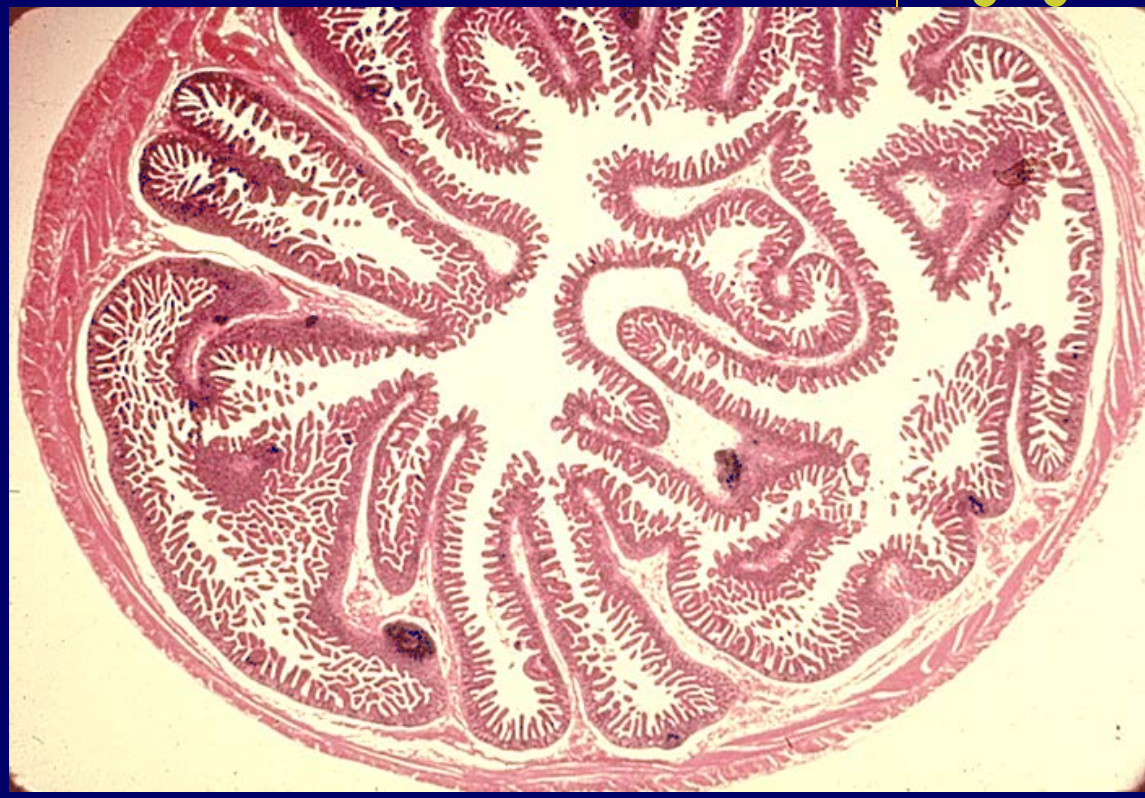
2. Jejunum: 240 cm long

3. Ileum: 360 cm long



SMALL INTESTINE

- Mucosa has transverse folds, prominent in proximal ileum, flat/absent at terminal ileum



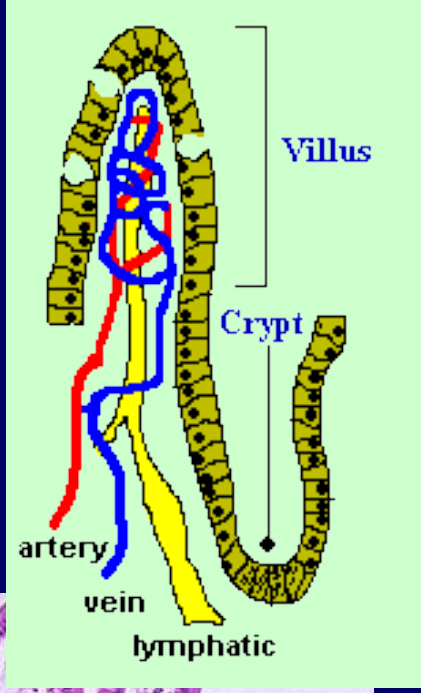
Small intestine

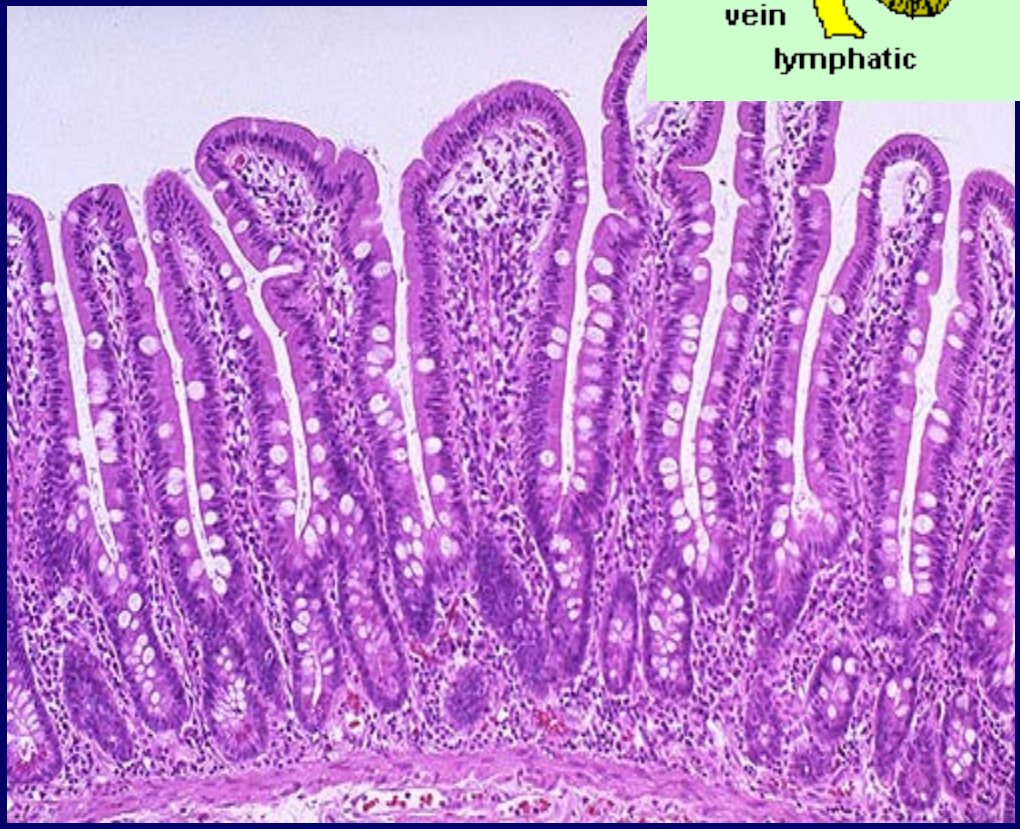
- Chemical digestion (carbohydrates, proteins, lipids, vitamins)
- Mechanical digestion and propulsion
- Major absorption

SMALL INTESTINAL MUCOSA

- Histology -

- Mucosa throughout entire small intestine is highly modified
- contains villi with central blood vessels, lymphatics, covered by simple columnar epithelium





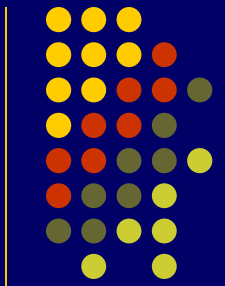
SMALL INTESTINE

- INFLAMMATORY DISORDERS
- INFECTIONS –GIARDIA
- POLYPS AND POLYPOSIS SYNDROMES
- NEOPLASMS: - EPITHELIAL
  - MESENCHYMAL
  - LYMPHOID
  - METASTASES

`

CELIAC DISEASE

(nontropical sprue, gluten-sensitive enteropathy)



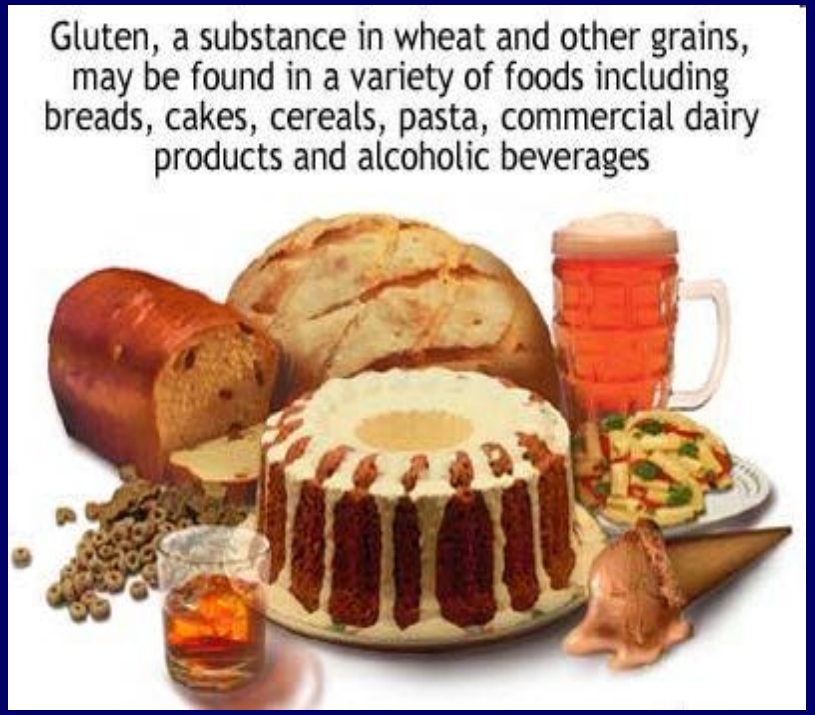
- Celiac disease is a condition that damages the lining of the small intestine and prevents it from absorbing parts of food that are important for staying healthy. The damage is due to a reaction to eating gluten, which is found in wheat, barley, rye, and possibly oats.

- T-cell mediated chronic inflammatory reaction with an autoimmune component, which most likely develops as a consequence of a loss of tolerance to gluten
- Major cause of malabsorption (*defective absorption of fats, fat-soluble and other vitamins, proteins, carbohydrates, electrolytes and minerals, and water)*

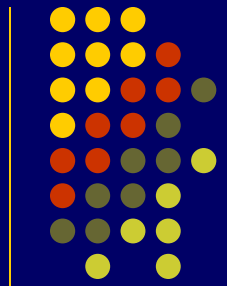
- Improves clinically and microscopically after withdrawal of wheat gliadins and related grain proteins from diet

CELIAC DISEASE

- Celiac disease cannot be cured.
- Symptoms will go away and the villi in the lining of the intestines will heal with lifelong gluten-free diet



CELIAC DISEASE



- Symptoms: diarrhea and failure to thrive in newborns; or symptoms of diarrhea/steatorrhea, flatulence, weight loss, fatigue beginning as late as age 40, dermatitis herpetiformis, neurologic disorders (tingling in hands and feet), unexplained iron deficiency anemia

- Late onset: 40’s and 50’s; symptoms of short stature, infertility, peripheral neuropathy, iron or folate deficiency, osteoporosis, indigestion, dental enamel defects

- long-term risk of malignancy: non-Hodgkin lymphoma (moderate risk), small intestinal adenocarcinoma, and esophageal squamous cell carcinoma (50- to 100-fold higher risk than the general population).

CELIAC DISEASE -diagnosis

1.Clinical presentation

2.Serological: antitransglutaminase (TTG) or antigliadin or antiendomysial antibodies

3.Biopsy of duodenum –gold standard

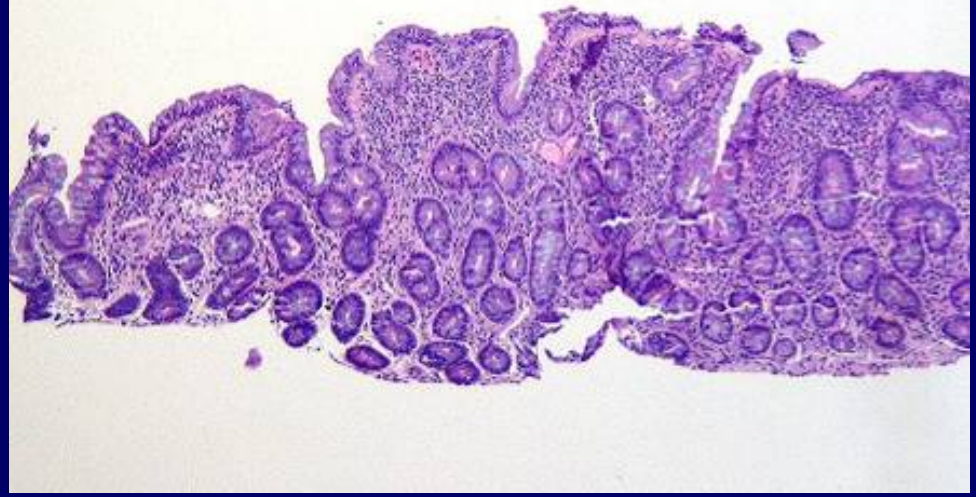
4.Improvement in symptoms and histology after gluten withdrawal

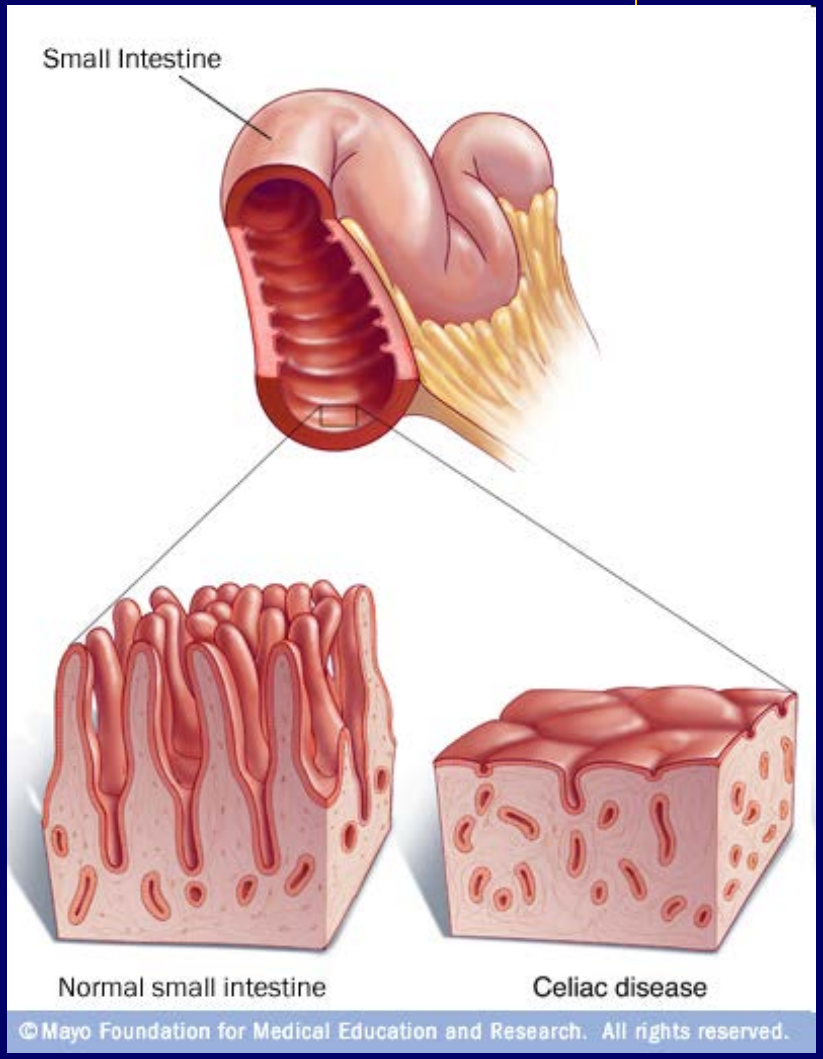
<u>Findings on small bowel biopsy:</u>

- Blunted villi lined by damaged surface epithelium
- Increased intraepithelial lymphocytes
- Hyperplastic crypts
- The lamina propria is expanded by a chronic mucosal inflammatory infiltrate

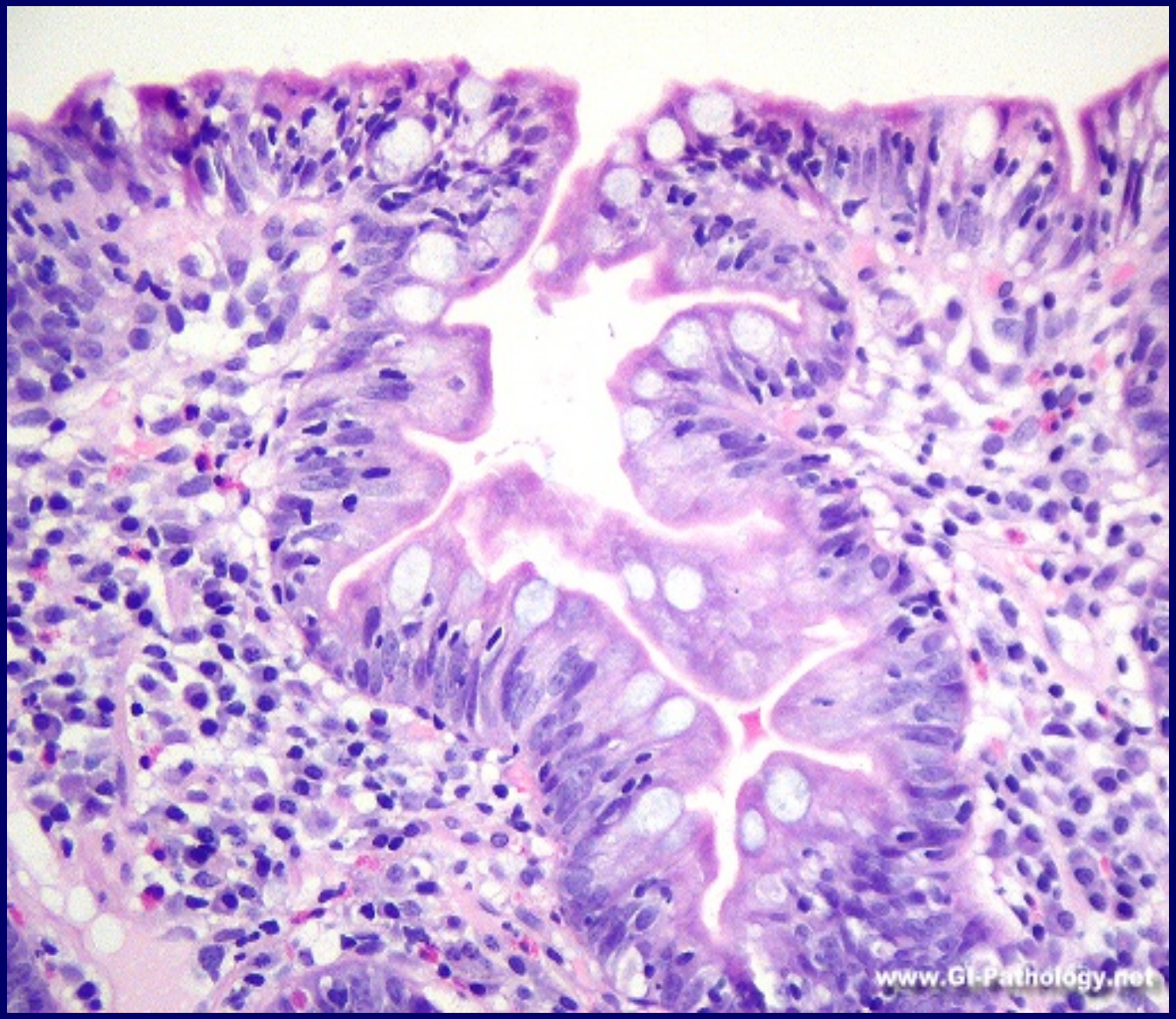
Normal villi

Blunted villi





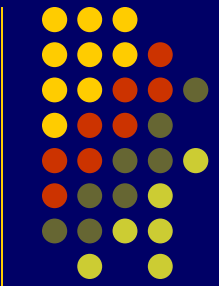
CELIAC DISEASE



Consequences of malabsorption

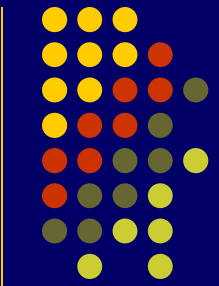
- *Alimentary tract:* diarrhea, flatus, abdominal pain, weight loss, and mucositis resulting from vitamin deficiencies
- *Hematopoietic system:* anemia from iron, pyridoxine, folate, and/or vitamin B12 deficiency and bleeding from vitamin K deficiency
- *Musculoskeletal system:* osteopenia and tetany from calcium, magnesium, and vitamin D deficiency
- *Endocrine system:* amenorrhea, impotence, and infertility from generalized malnutrition; hyperparathyroidism from protracted calcium and vitamin D deficiency
- *Epidermis:* purpura and petechiae from vitamin K deficiency, edema from protein deficiency, dermatitis and hyperkeratosis from deficiencies of vitamin A , zinc, essential fatty acids and niacin
- *Nervous system:* peripheral neuropathy from vitamin A and B12 deficiencies.

Giardiasis- Traveler's diarrhea



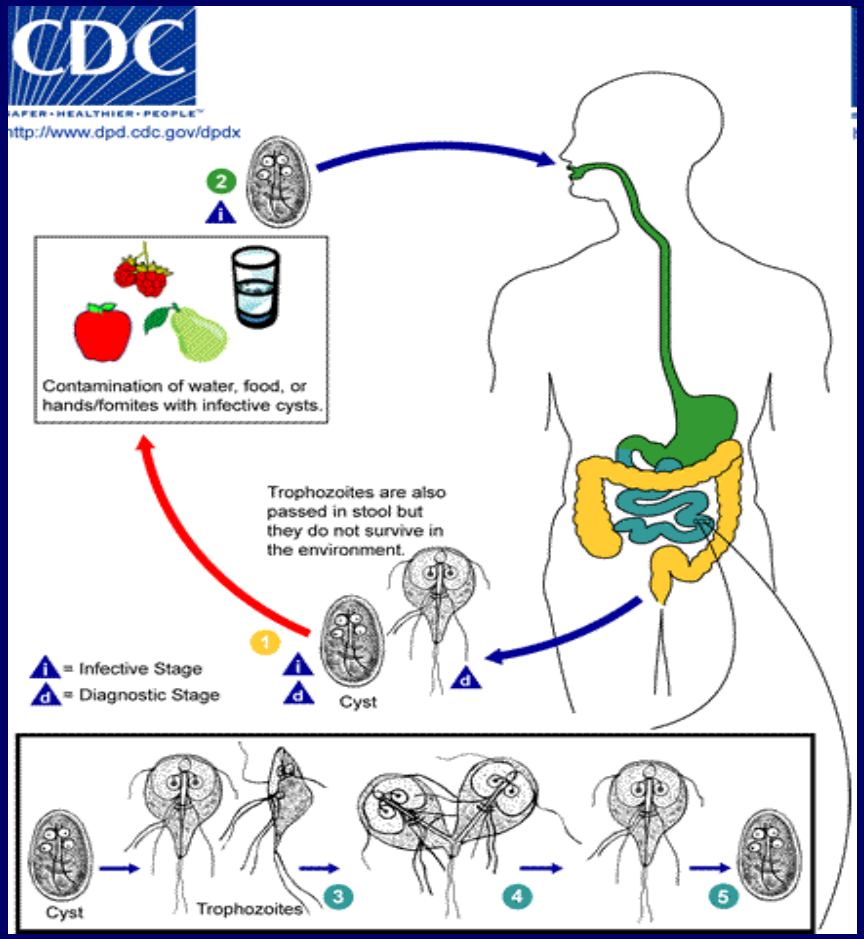
- Giardiasis is an infection of the small intestine caused by a microscopic organism (protozoa), *Giardia lamblia*.
- water supplies become contaminated with raw sewage.
- It can be contracted by drinking water from lakes or streams where beavers and muskrats, or domestic (sheep), have caused contamination.
- It is also spread by direct person-to-person contact, which has caused outbreaks in institutions such as day care centers.

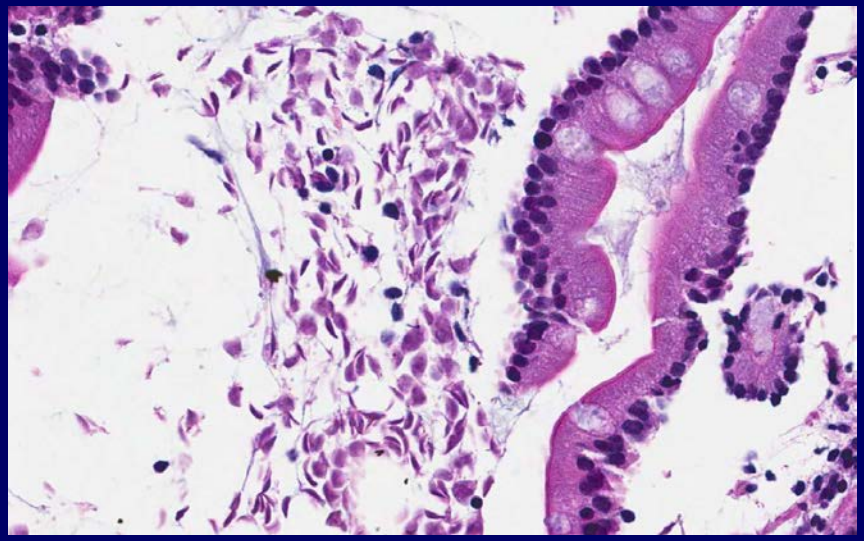
Giardiasis- Traveler's diarrhea



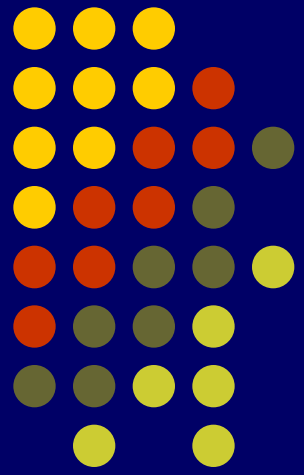
- **Symptoms**
- Abdominal pain
- Diarrhea
- Gas or bloating
- Headache
- Loss of appetite
- Low-grade fever
- Nausea
- Swollen or distended abdomen
- Vomiting

Giardia lamblia

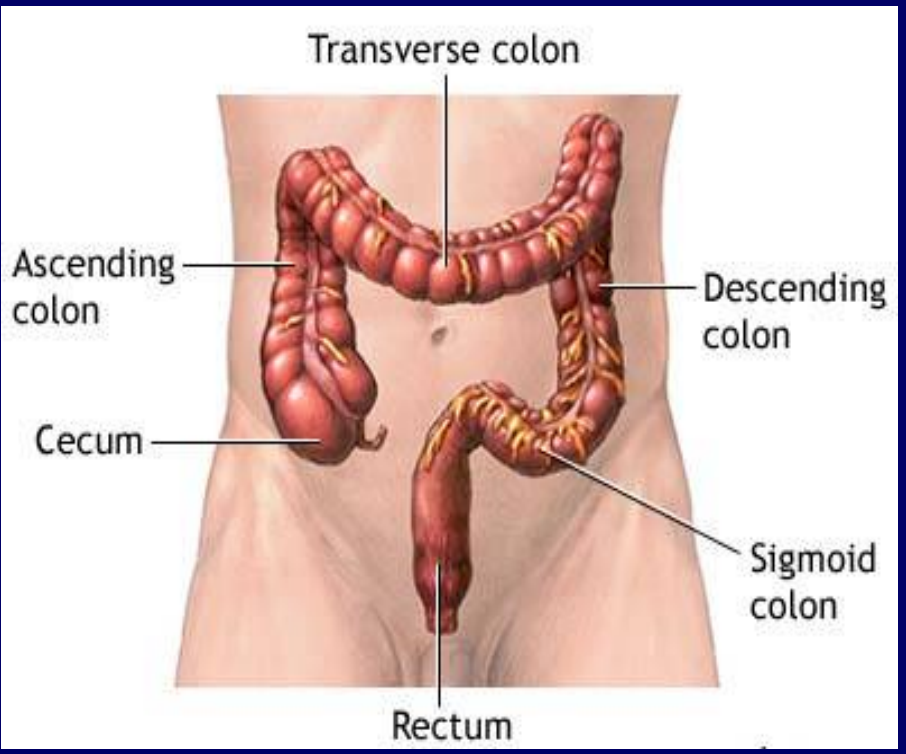


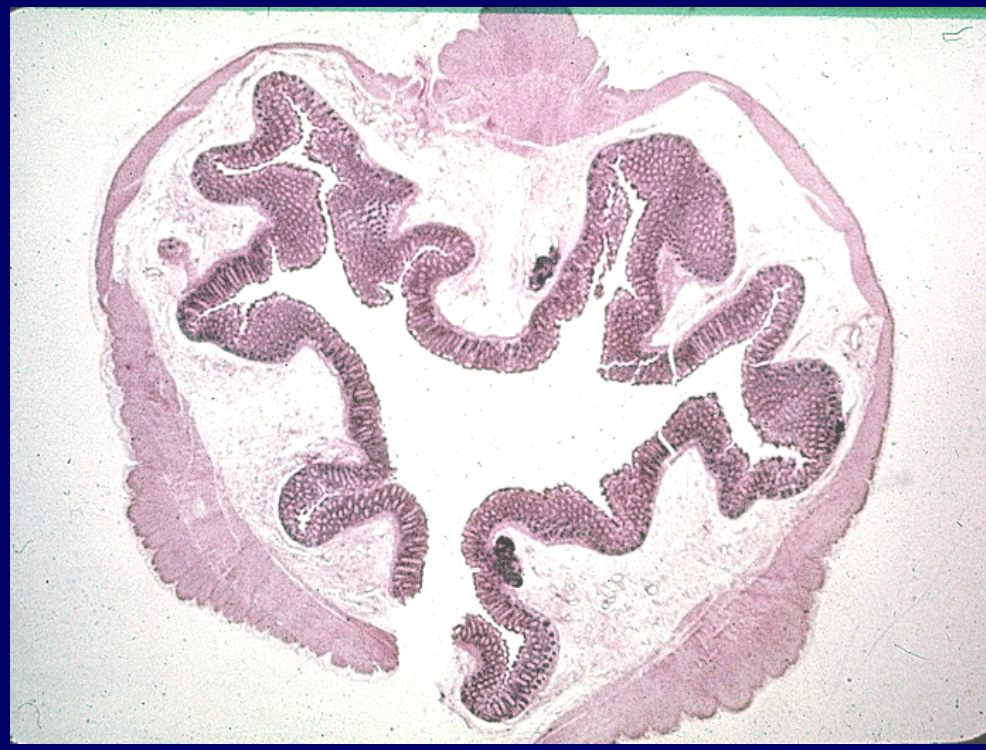


LARGE INTESTINE (COLON)



THE LARGE INTESTINE (COLON)

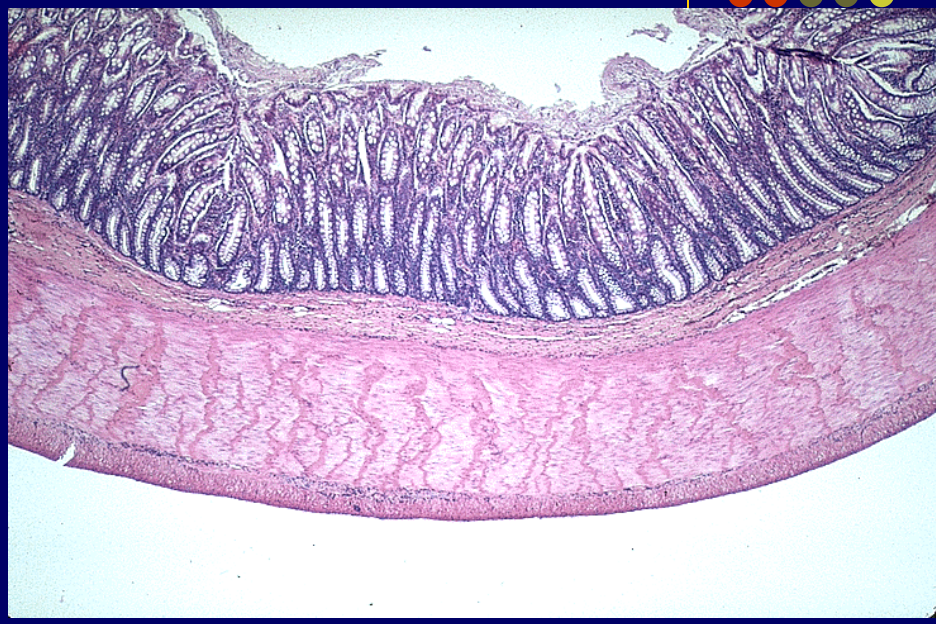




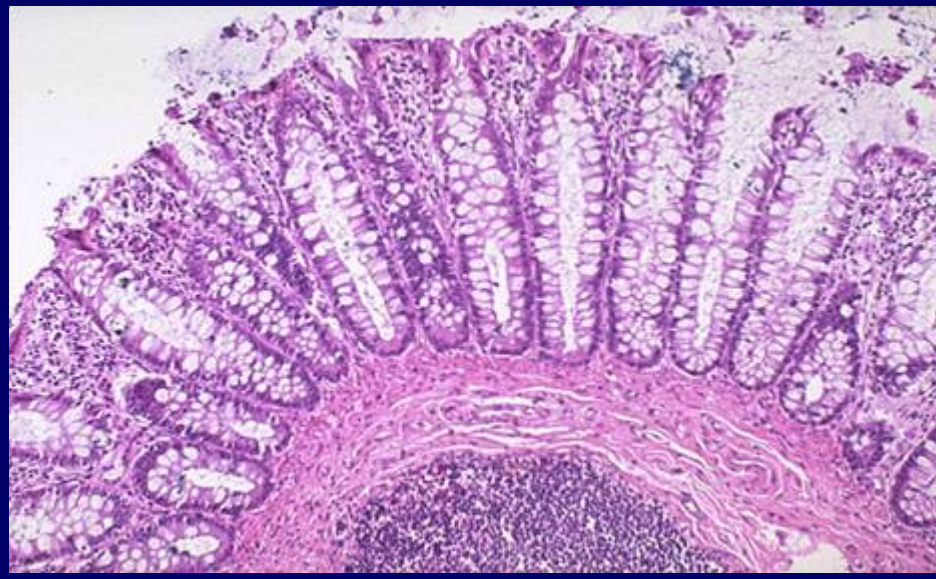
COLON
HISTOLOGY

Colonic wall four layers:

1. Mucosa
2. Submucosa
3. Muscularis propria
4. Serosa



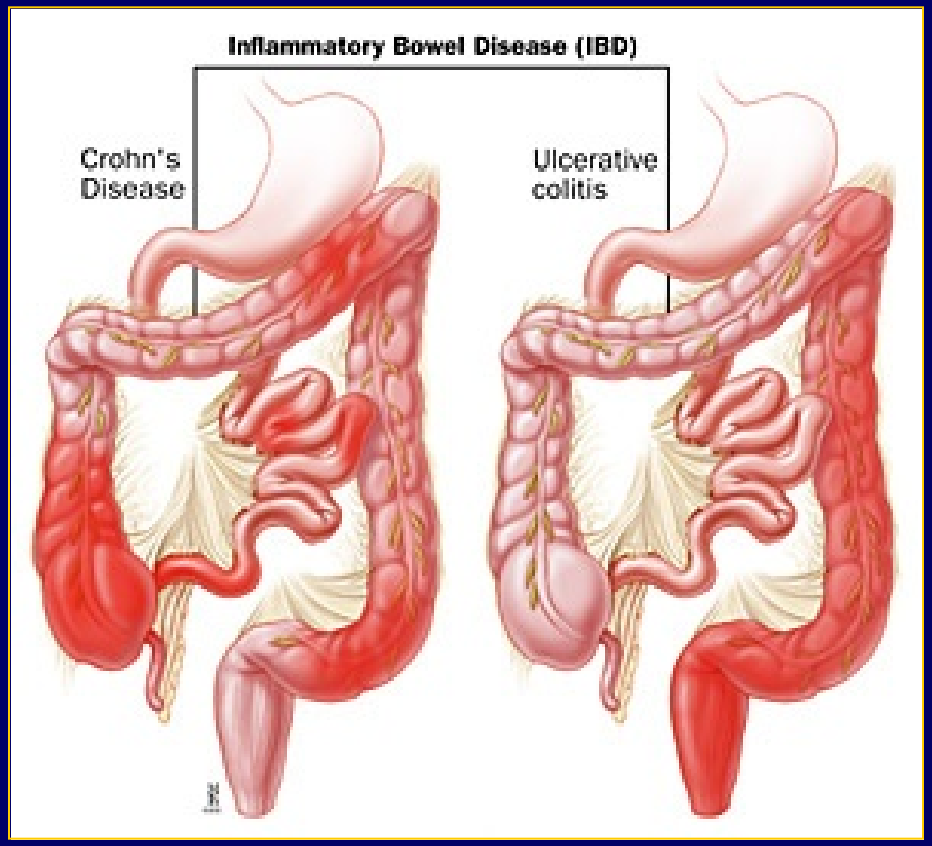
The **mucosa** of the appendix, colon, and rectum has a simple columnar epithelium shaped into straight tubular crypts. There are no villi.



COLON
- PATHOLOGY -

- Inflammatory bowel disease (IBD)
- Enterocolitis – infectious, AIDS, malabsorption, deranged motility
- Congenital anomalies (duplication, malrotation)
- Vascular disorders
- Diverticular disease
- Intestinal obstruction
- Tumors – benign and malignant

Inflammatory bowel disease



- Chronic,relapsing inflammatory conditions resulting from inappropriate and persistent activation of the mucosal immune system
- No known cause (idiopathic)

- Two diseases:
  - **Crohn's disease**
  - **Ulcerative colitis**

Inflammatory bowel disease

Normally, mucosal immune system is unresponsive to normal intestinal microflora

Two key pathogenic abnormalities:

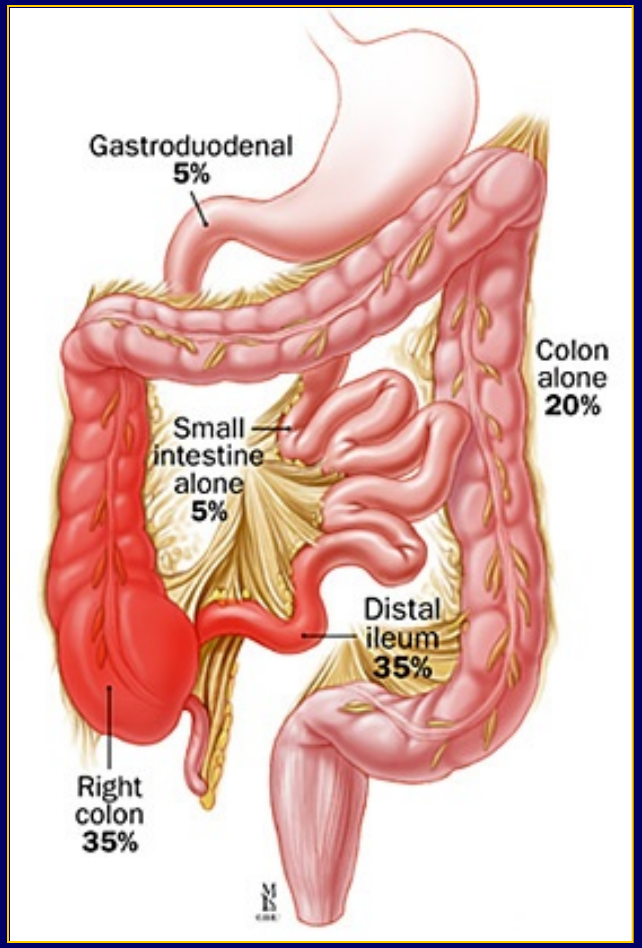
- strong immune responses against normal flora
- defects in epithelial barrier function

- DX: clinical history, endoscopic examination, laboratory findings, and pathology

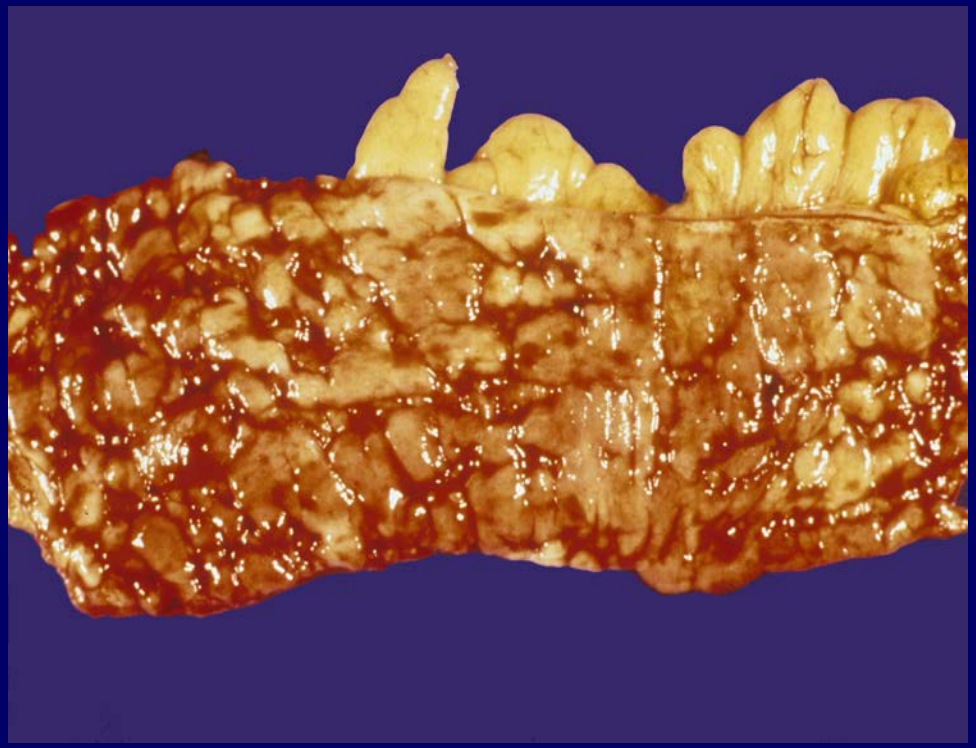
CROHN'S DISEASE

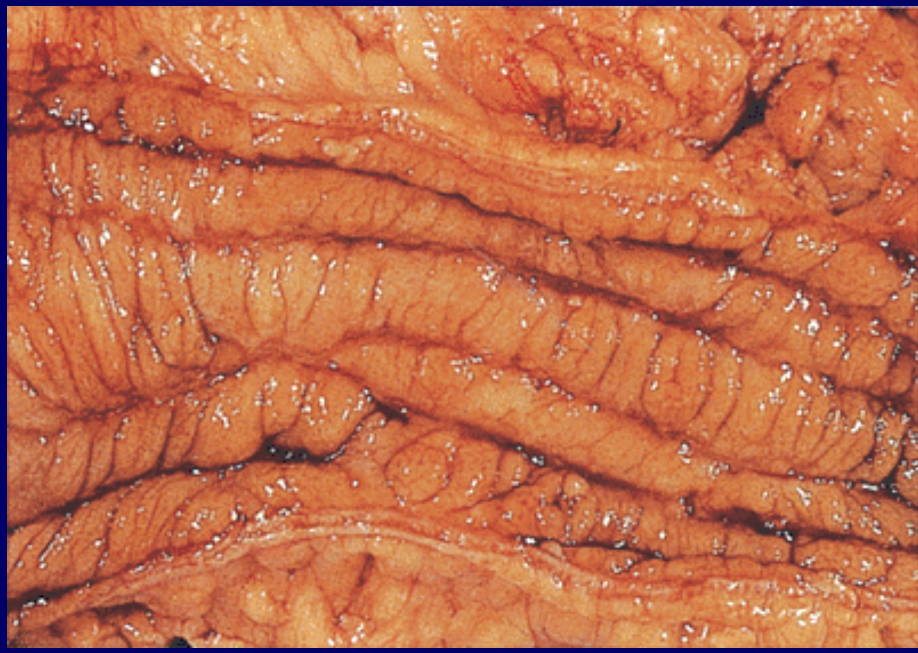
- Can involve any/all digestive organ from mouth to anus
- Most commonly involves terminal ileum and colon, discontinuously (skip areas)
- Clinical features:

- Diarrhea
- Abdominal pain
- Rectal bleeding (40%)
- Mass lesion (RLQ)
- Perianal Lesions
  - ñ anal fistulae
  - ñ anal stricture
  - ñ perianal abcess
- Intestinal obstruction
- Fistulae between bowel loops



CD

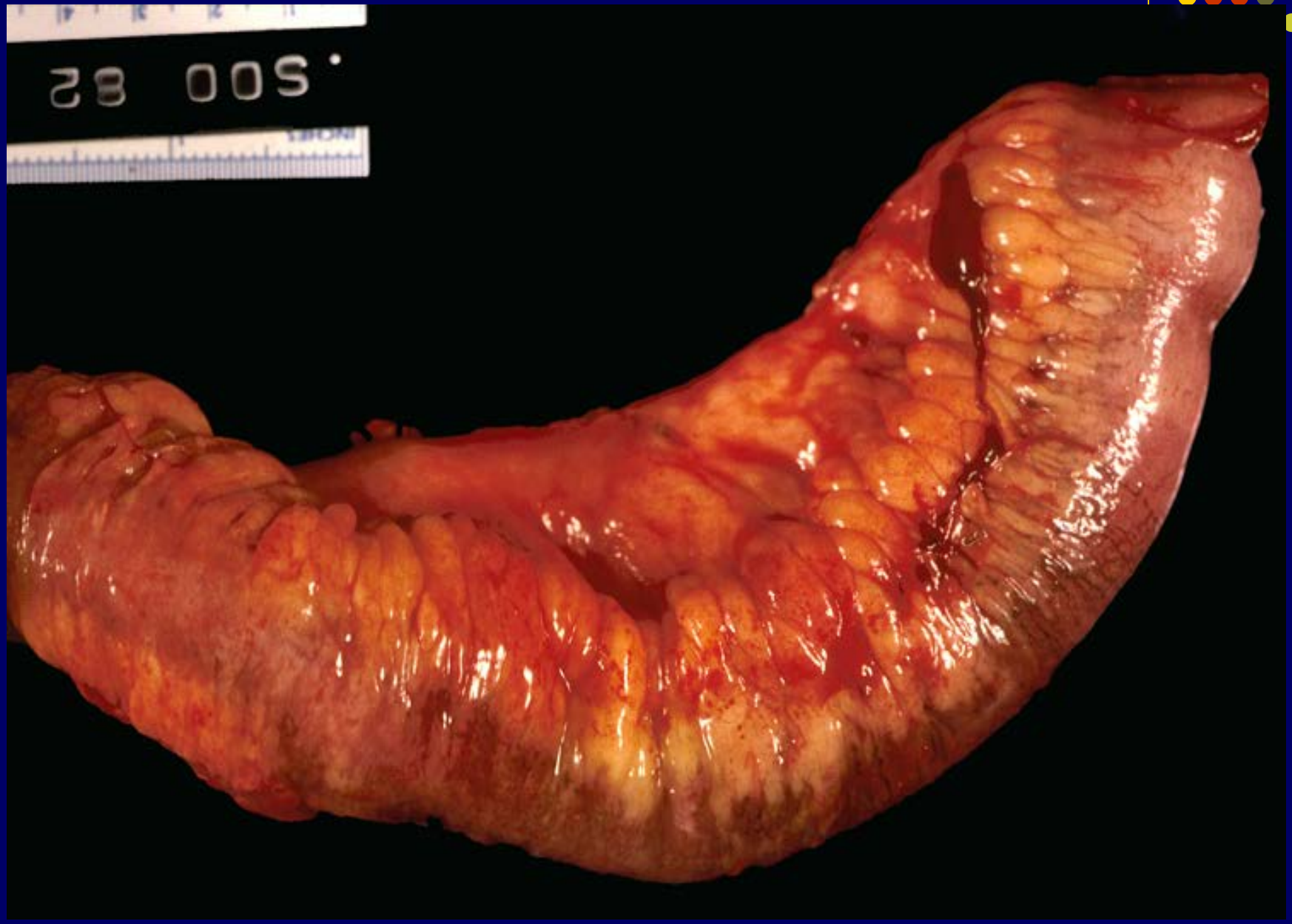




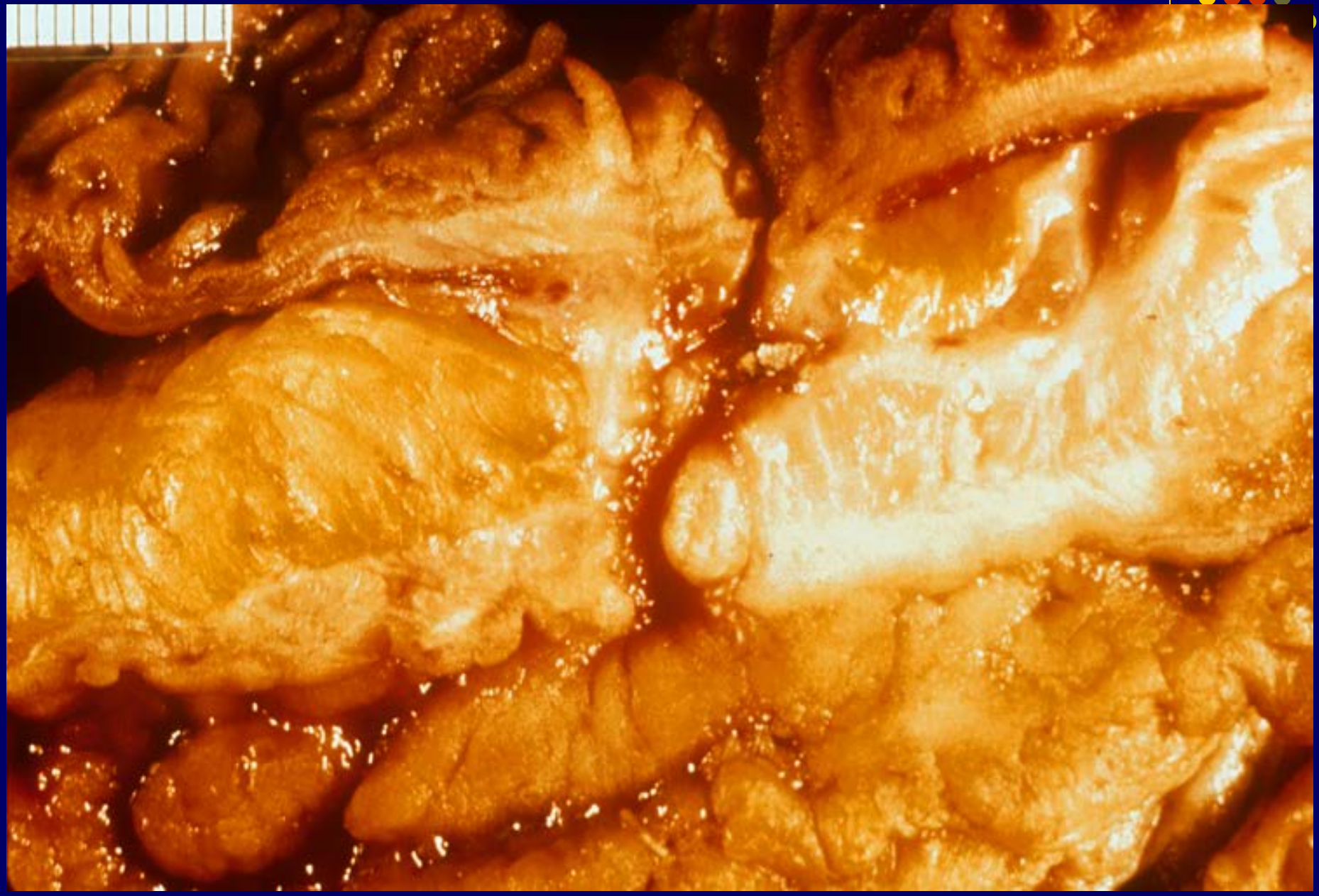
Since both linear and transverse ulcers are present, the mucosa has a cobblestone appearance.

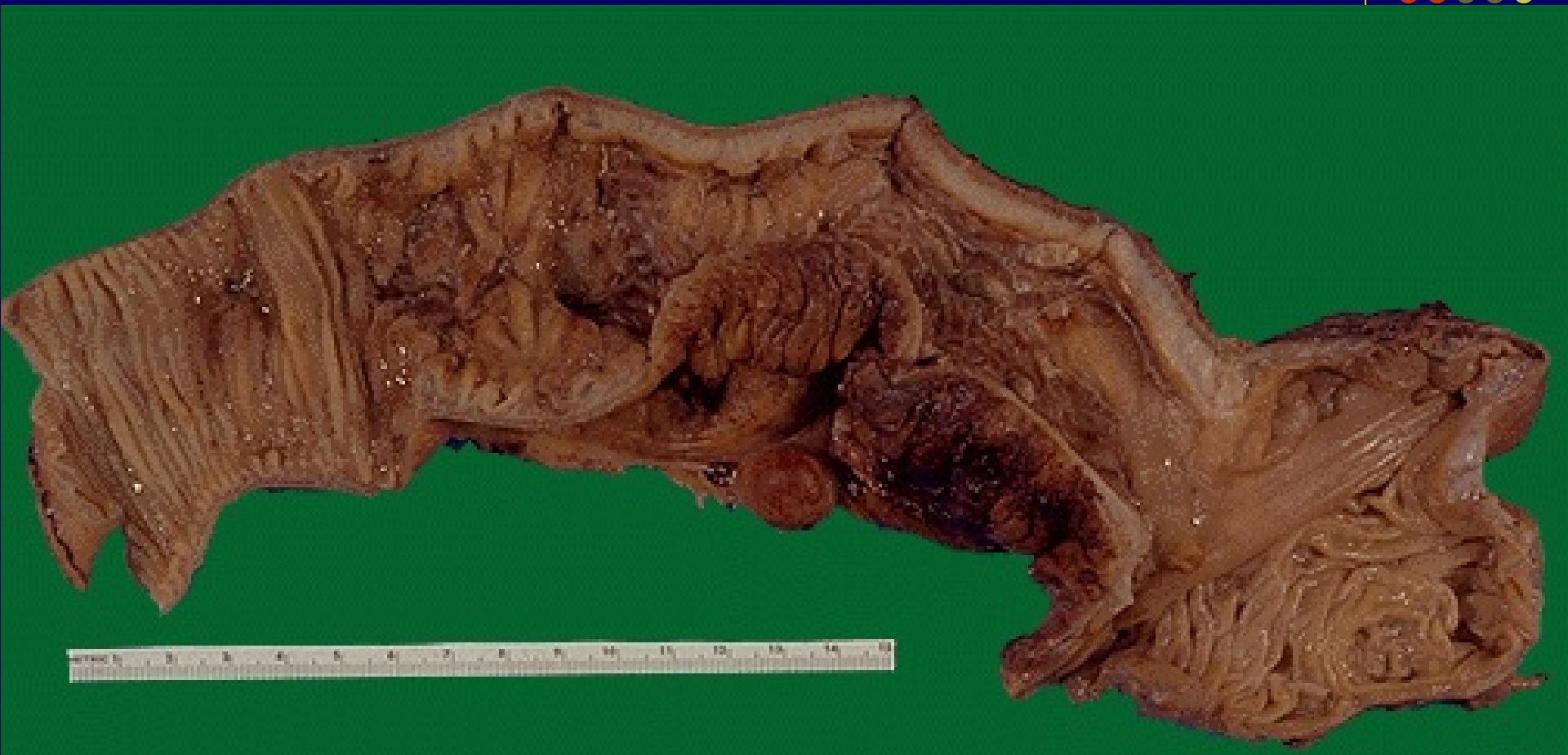
Prominent linear ulcers are present. The combination of ulceration and edema produces long linear ulcers, which produce “railroad tracks” when they heal.

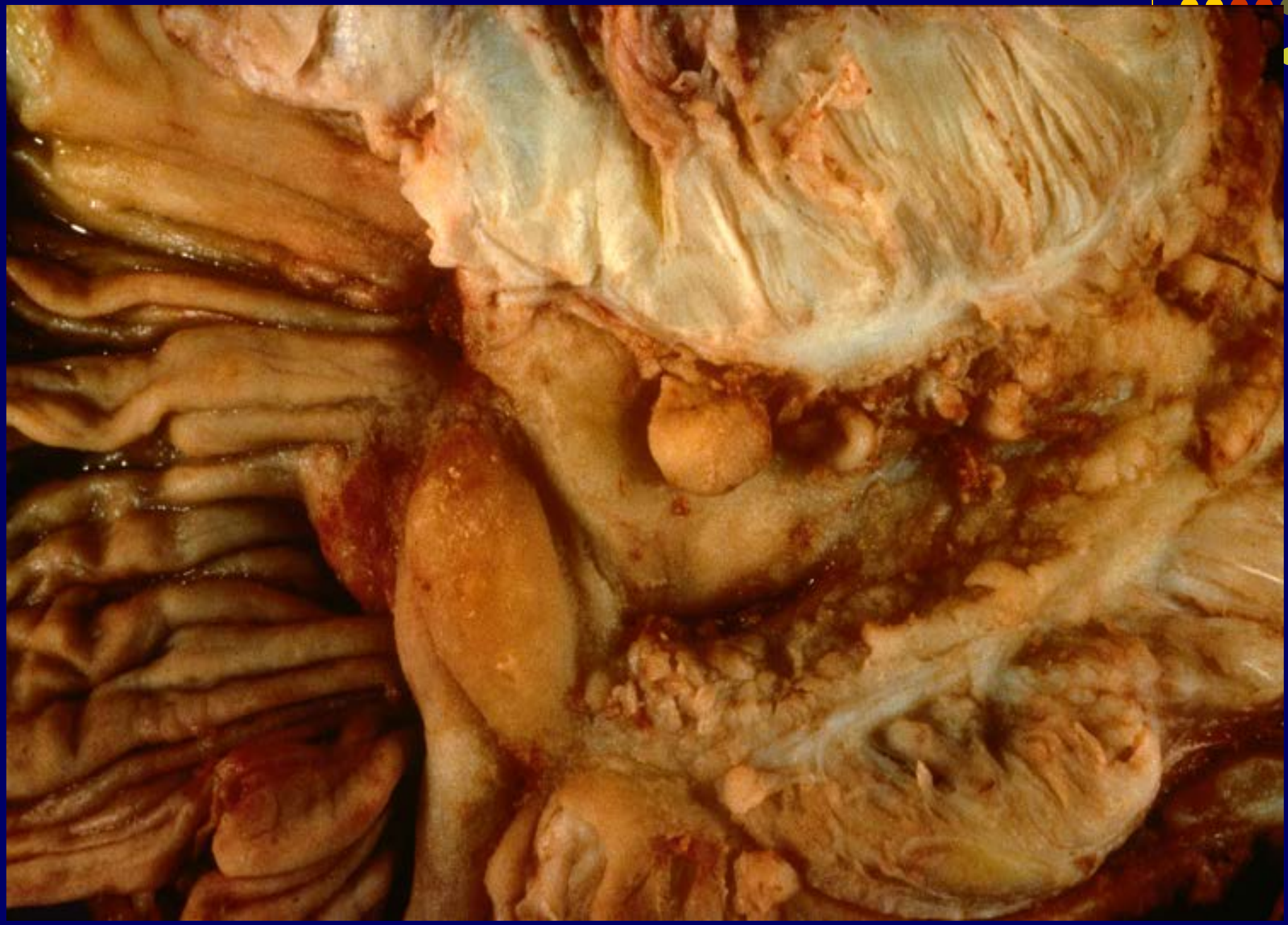
Fat wrapping



Long fissure

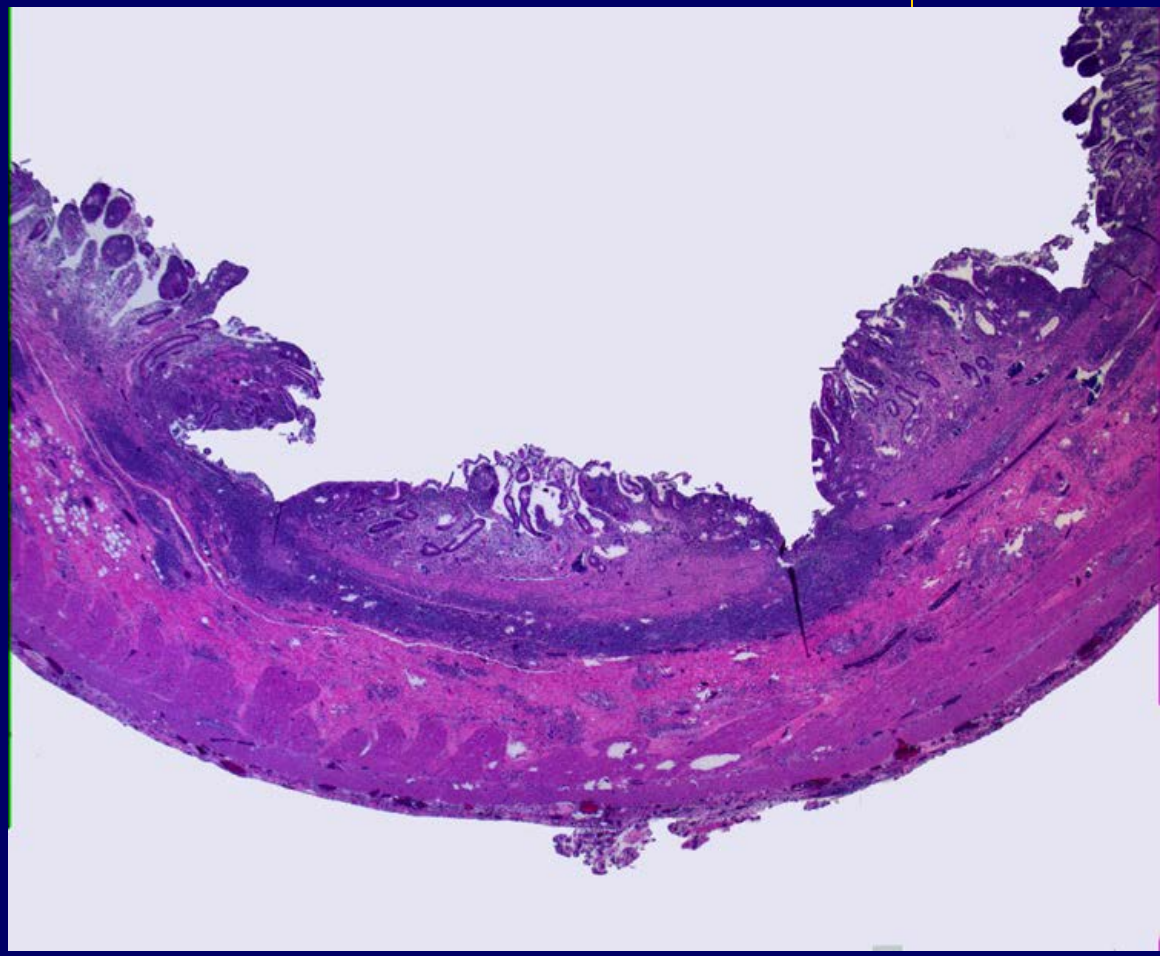


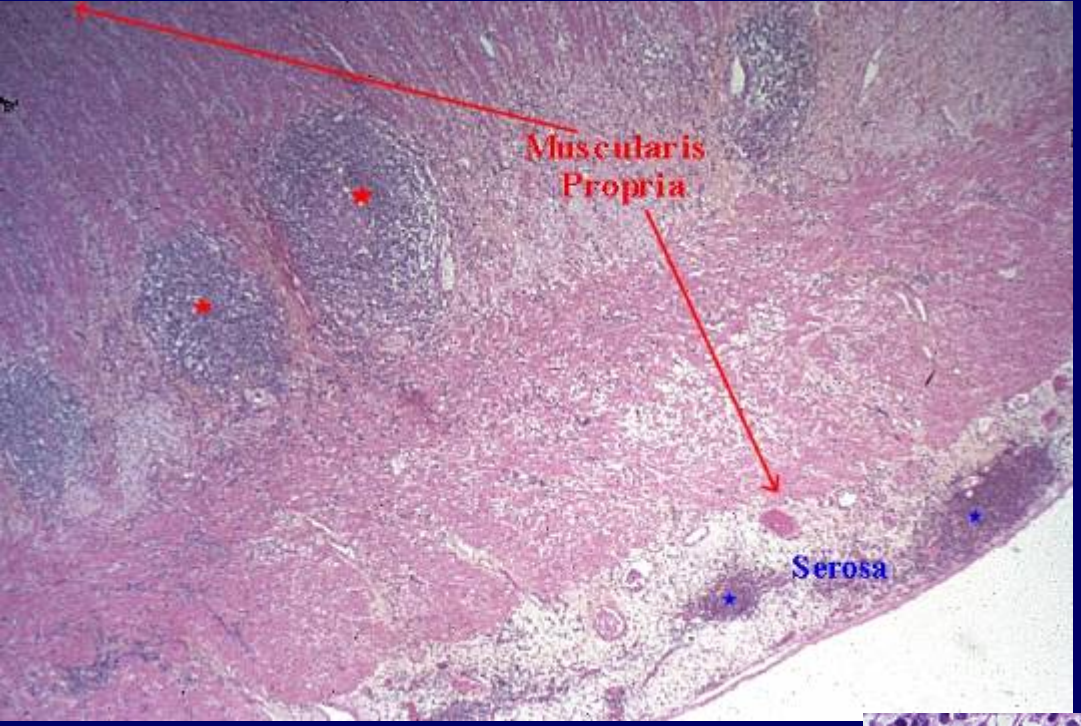


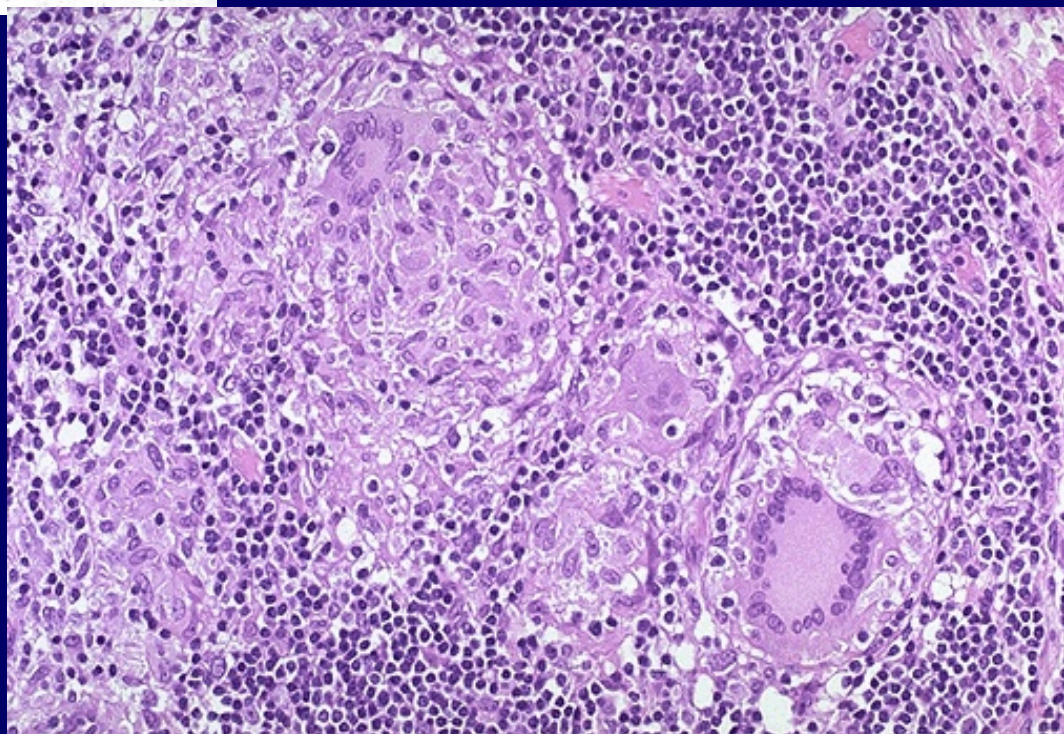


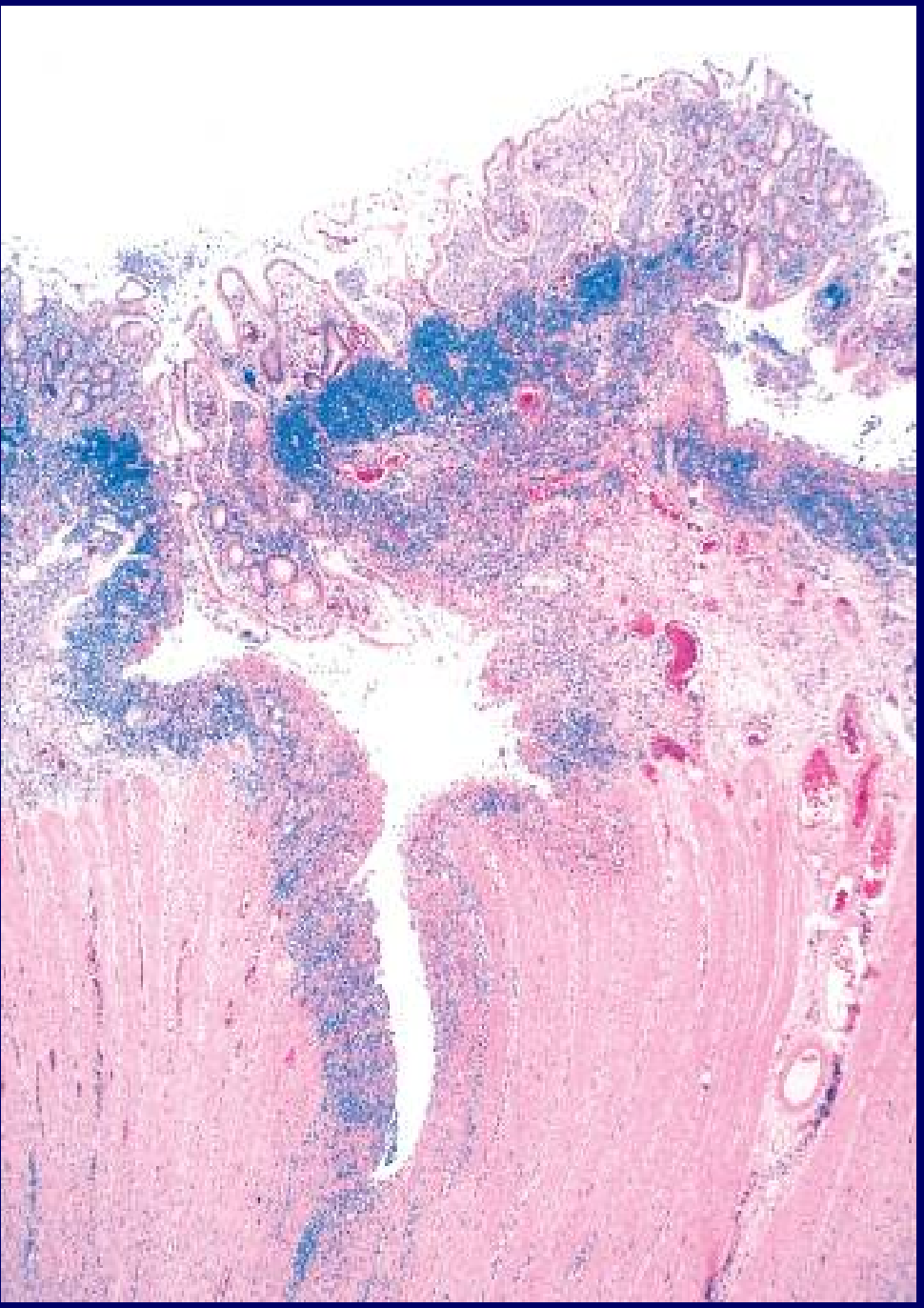
PATHOLOGY IN CD

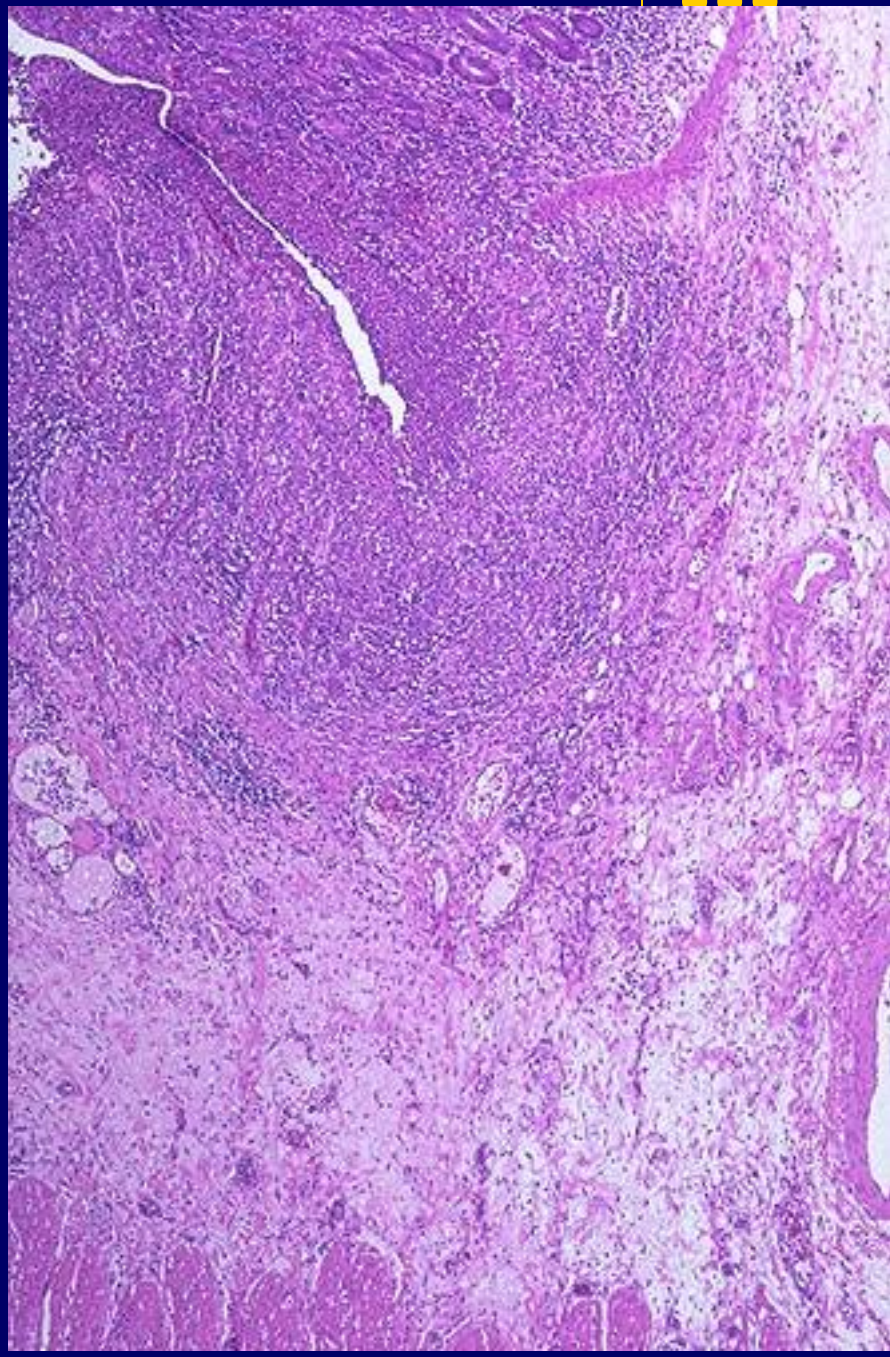
- Transmural inflammation
- Chronic mucosal damage - architectural distortion
- Granulomas
- Lymphoid aggregates
- Fissures, ulcerations
- Intervening normal mucosa (“Skip areas”)

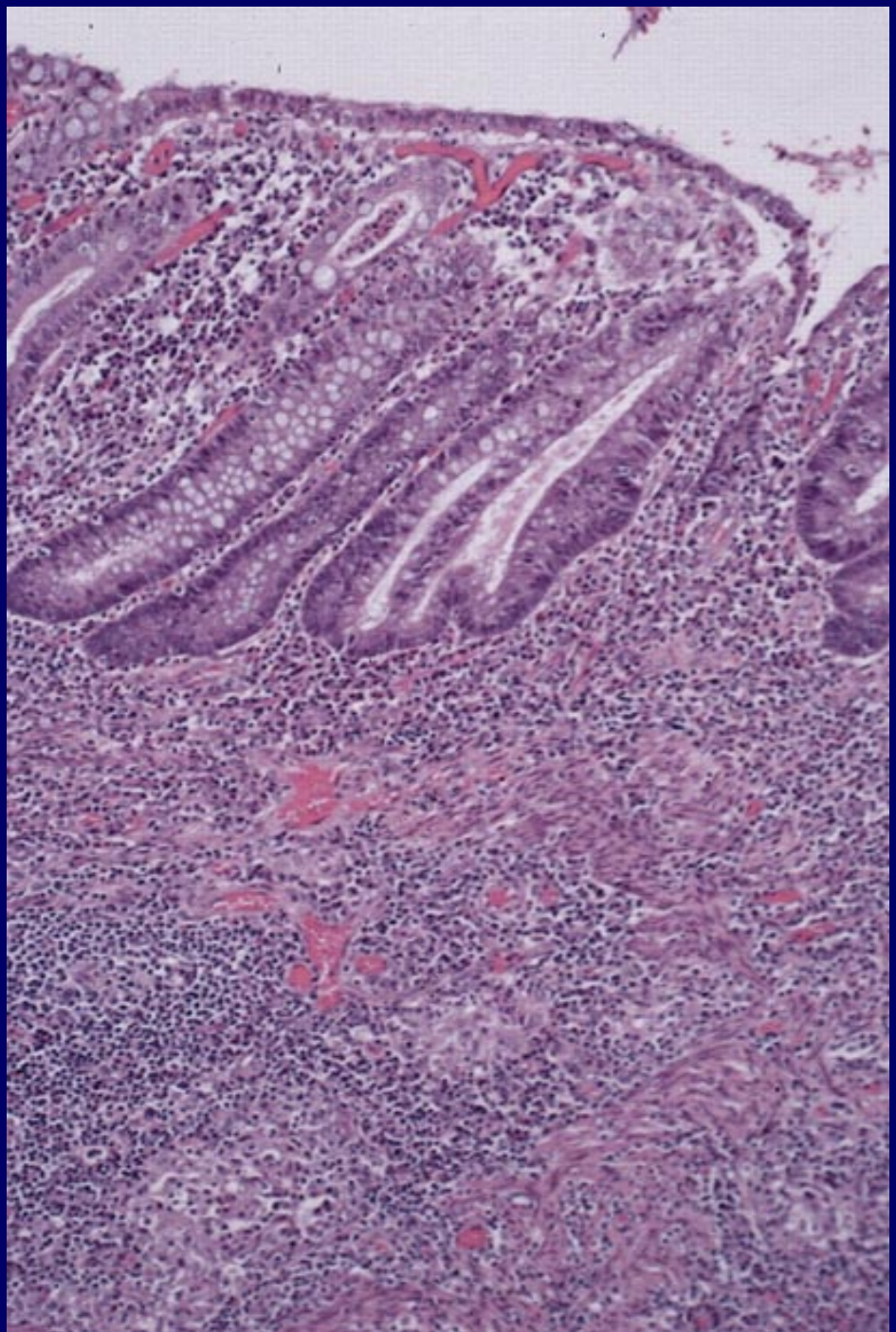



Muscularis
Propria
Serosa









COMPLICATIONS (CD)

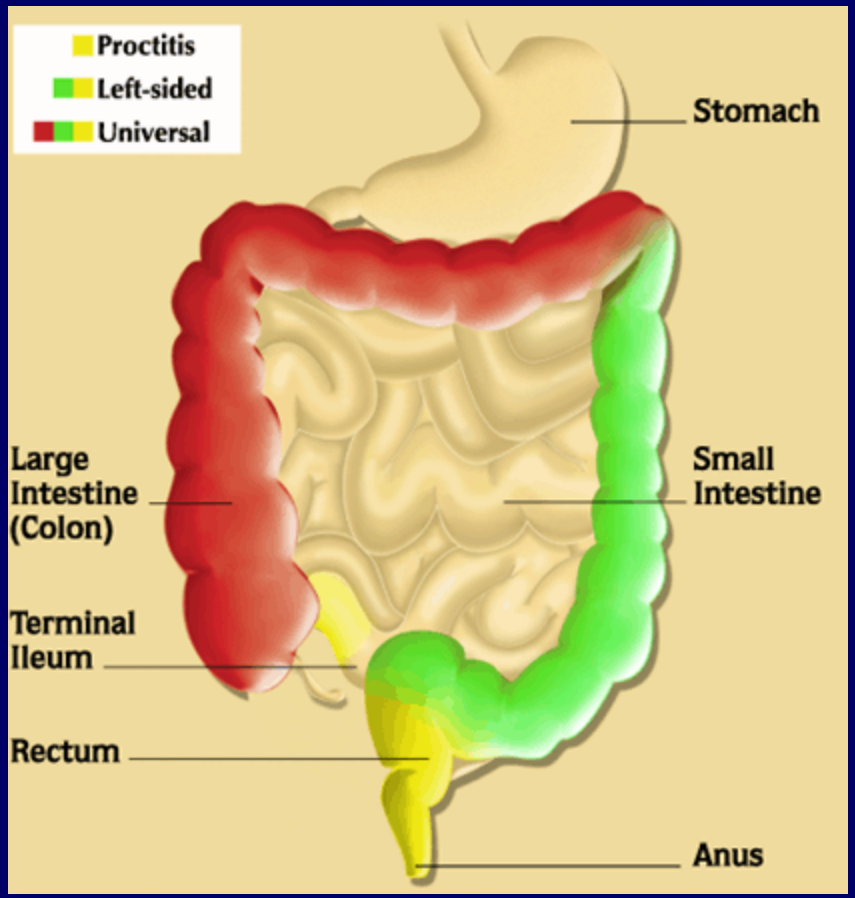
- Intestinal complications: *fibrosing strictures, fistulas* to other loops of bowel, the urinary bladder, vagina, or perianal skin, or into a peritoneal abscess, *marked loss of albumin (protein-losing enteropathy), generalized malabsorption, specific malabsorption of vitamin B12*
- Extra-Intestinal complications: migratory polyarthritis, sacroiliitis, ankylosing spondylitis, erythema nodosum, and clubbing
- Dysplasia and carcinoma

ULCERATIVE COLITIS

- Ulcerative proctitis (rectum only)
- Left-sided UC(rectum + left colon)
- Pancolitis

- Clinical features:

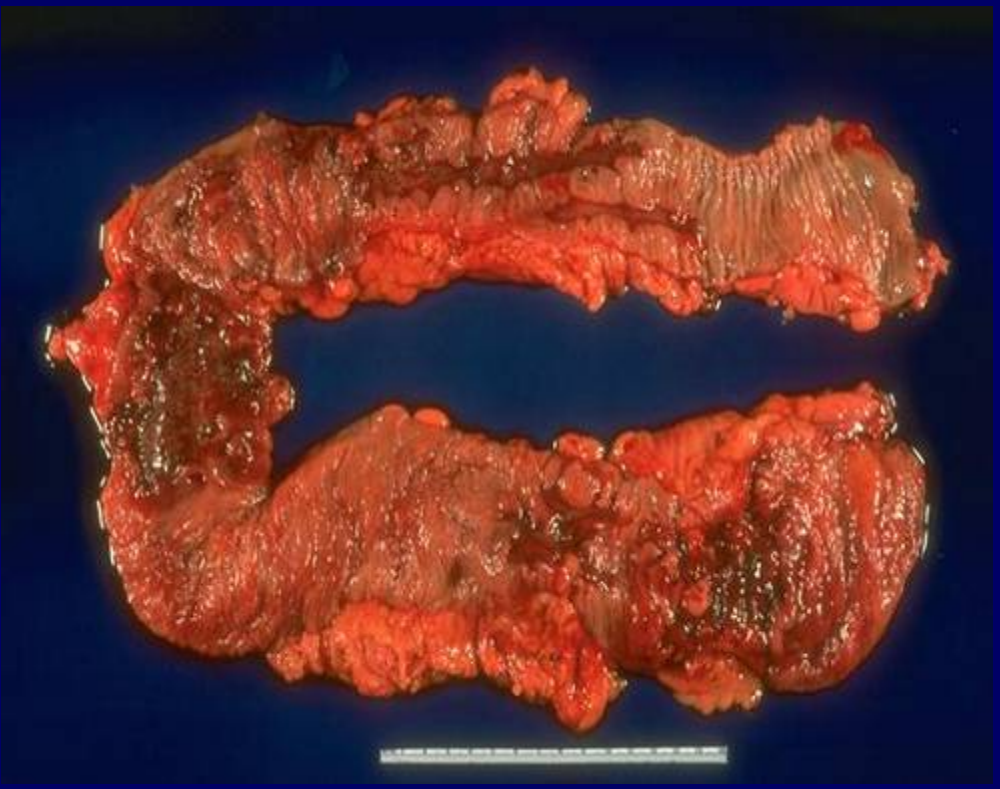
- Rectal bleeding
- Abdominal pain
- Diarrhea, episodic, severe
- Fulminant disease

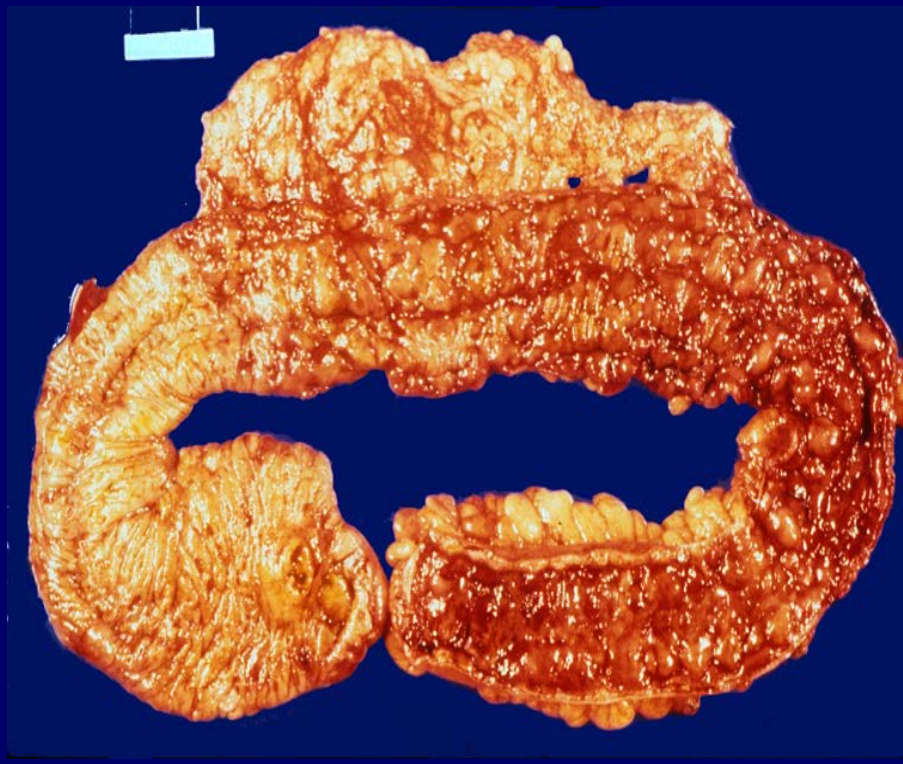


- Pancolitis with ulceration and numerous pseudopolyps throughout the entire length of the specimen

CD

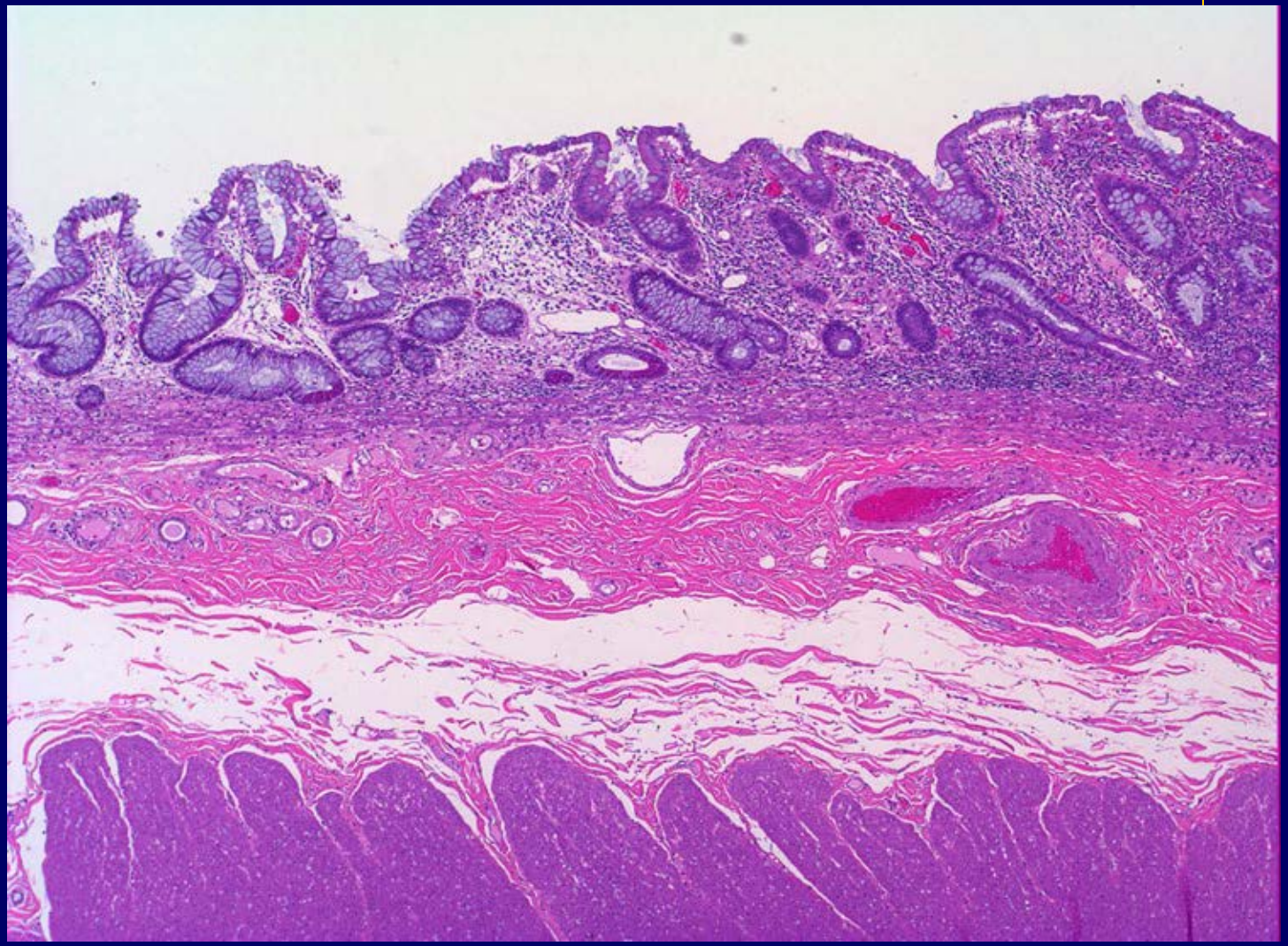
UC





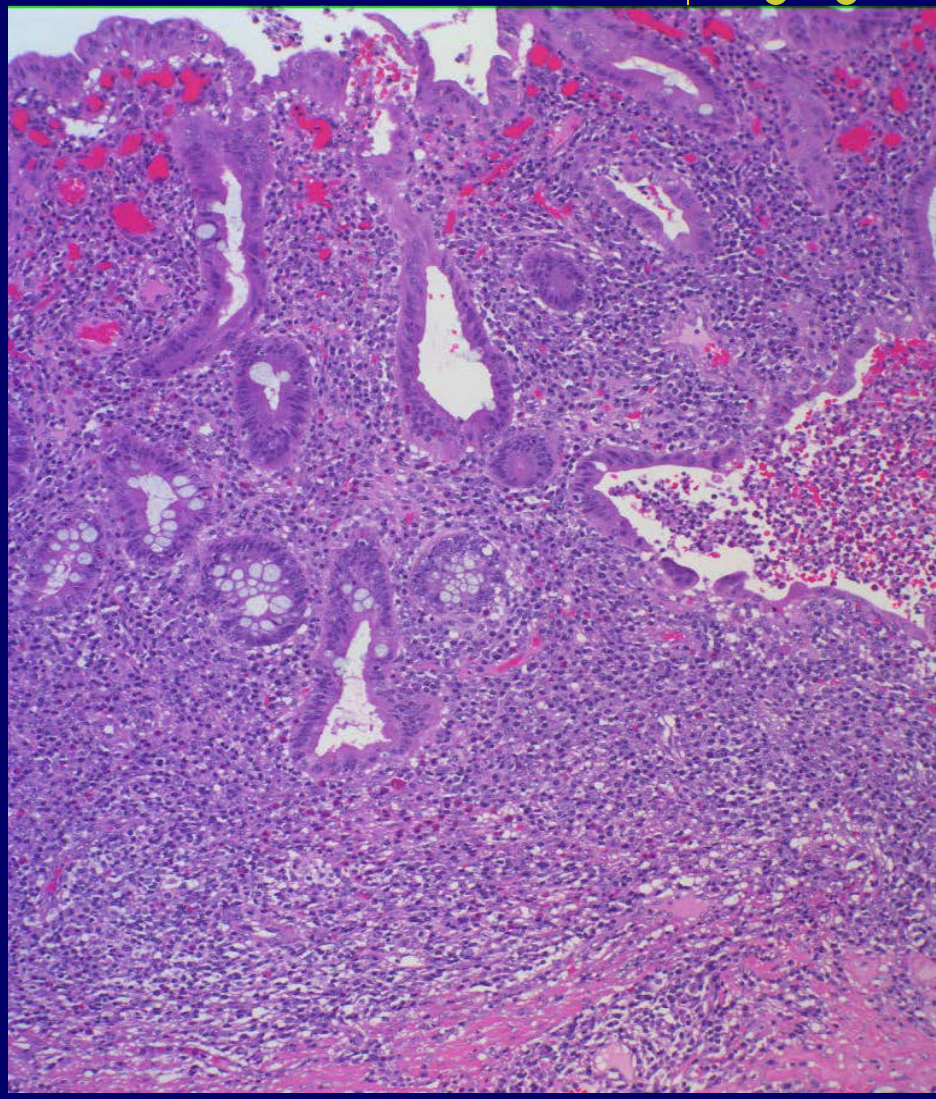
PATHOLOGY in UC

- Chronic inflammation restricted to mucosa

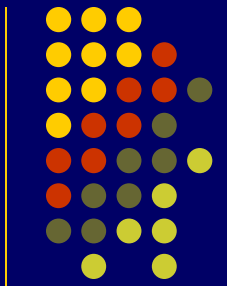


PATHOLOGY in UC

- Acute Inflammation – acute cryptitis, crypt abscesses
- Crypt destruction/distortion
- Basal cell plasmacytosis
- No granulomas, no skip areas
- Cellular change in the crypt
  - Mucin depletion
  - Paneth cell metaplasia
  - increased neuro endocrine cells



COMPLICATIONS



- Intestinal : fulminant UC, toxic megacolon, secondary infection, strictures
- Extra-intestinal complications: migratory polyarthritis, sacroiliitis, ankylosing spondylitis, uveitis, pericholangitis and primary sclerosing cholangitis, skin lesions
- Dysplasia / Carcinoma - risk is highest in patients with pancolitis of 10 or more years' duration, in whom it is 20- to 30-fold higher

COLONIC TUMORS

BENIGN:

- POLYPS

MALIGNANT:

- ADENOCARCINOMA
- NEUROENDOCRINE TUMORS
- GASTROINTESTINAL STROMAL TUMOR (GIST)
- LYMPHOMA

COLONIC POLYPS

- **Non-neoplastic (benign):**

- Hyperplastic -90%
- Hamartomatous: Juvenile, Peutz-Jeghers
- Inflammatory
- Lymphoid

- **Neoplastic**

- Adenoma –TA, TVA, serrated, mixed polyps

ADENOMAS

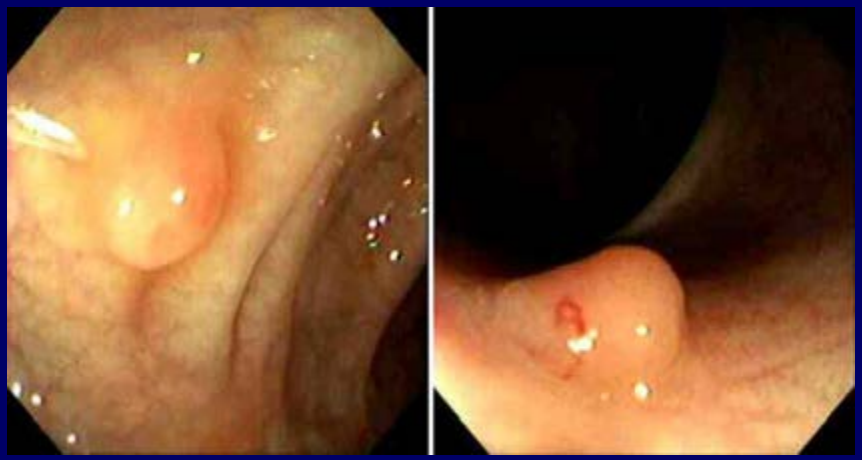
- POLYPS- Any lesion which protrudes above the level of the surrounding mucosa.
- Adenomas - intraepithelial neoplasms
- 40% to 50% after age 60
- Adenomatous polyps are segregated into three subtypes on the basis of the epithelial architecture:
- *Tubular adenomas*: tubular glands
- *Villous adenomas:* villous projections
- *Tubulovillous adenoma:* a mixture of the above

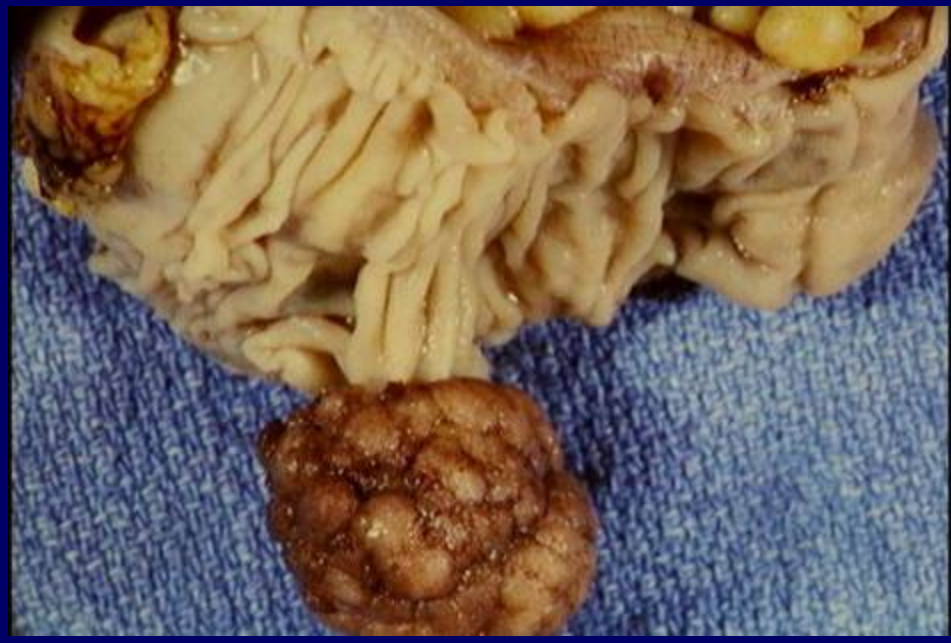
ADENOMAS

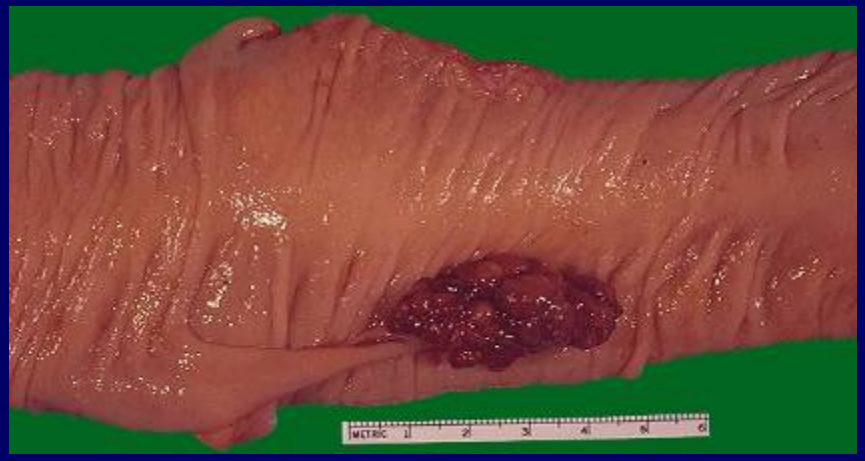
- precursor lesion for invasive colorectal adenocarcinomas
- The malignant risk with an adenomatous polyp is correlated with three interdependent features:

- polyp size >2cm
- histologic architecture VA>TVA>TA
- severity of epithelial dysplasia

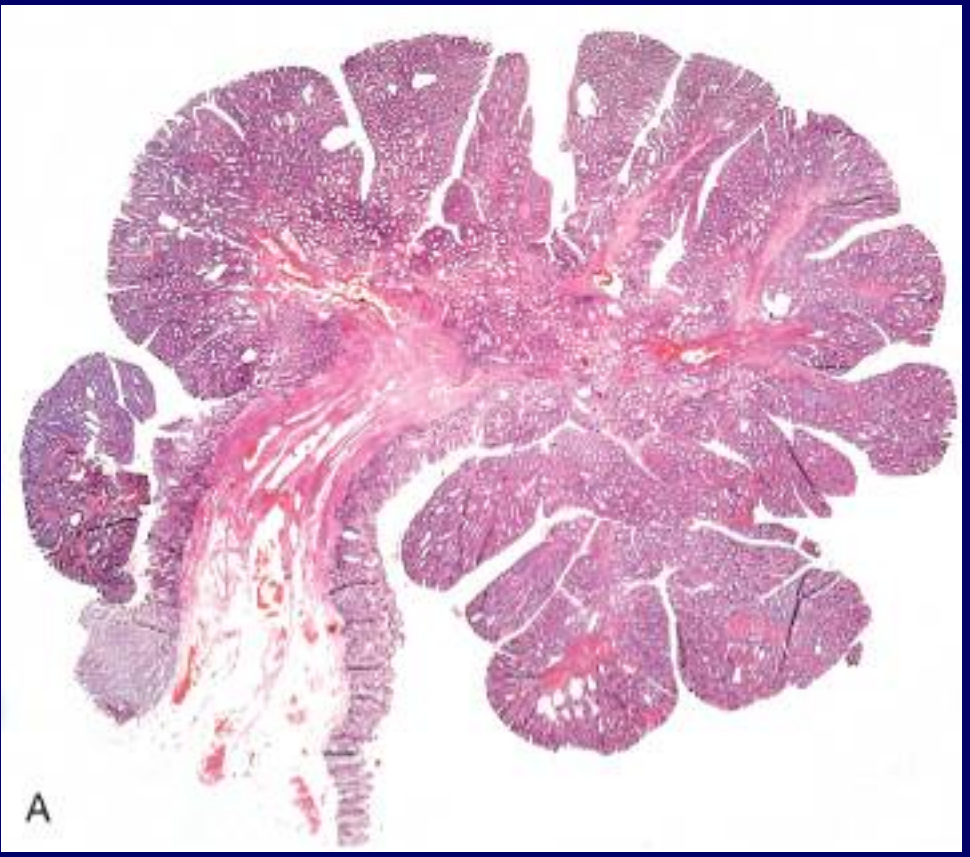
TUBULAR ADENOMA

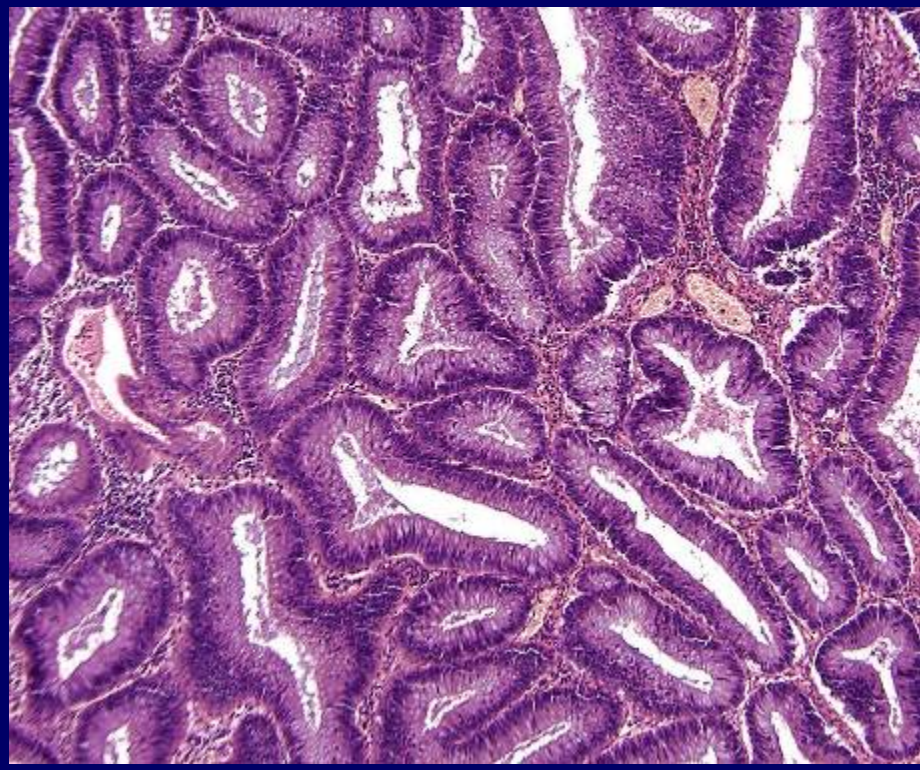




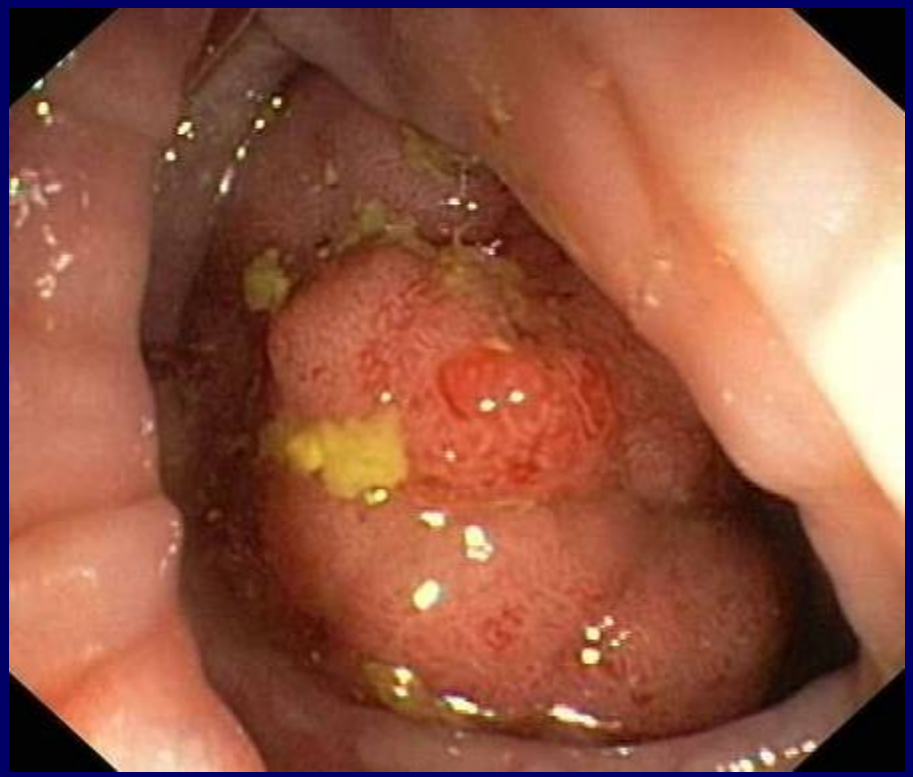


TUBULAR ADENOMA

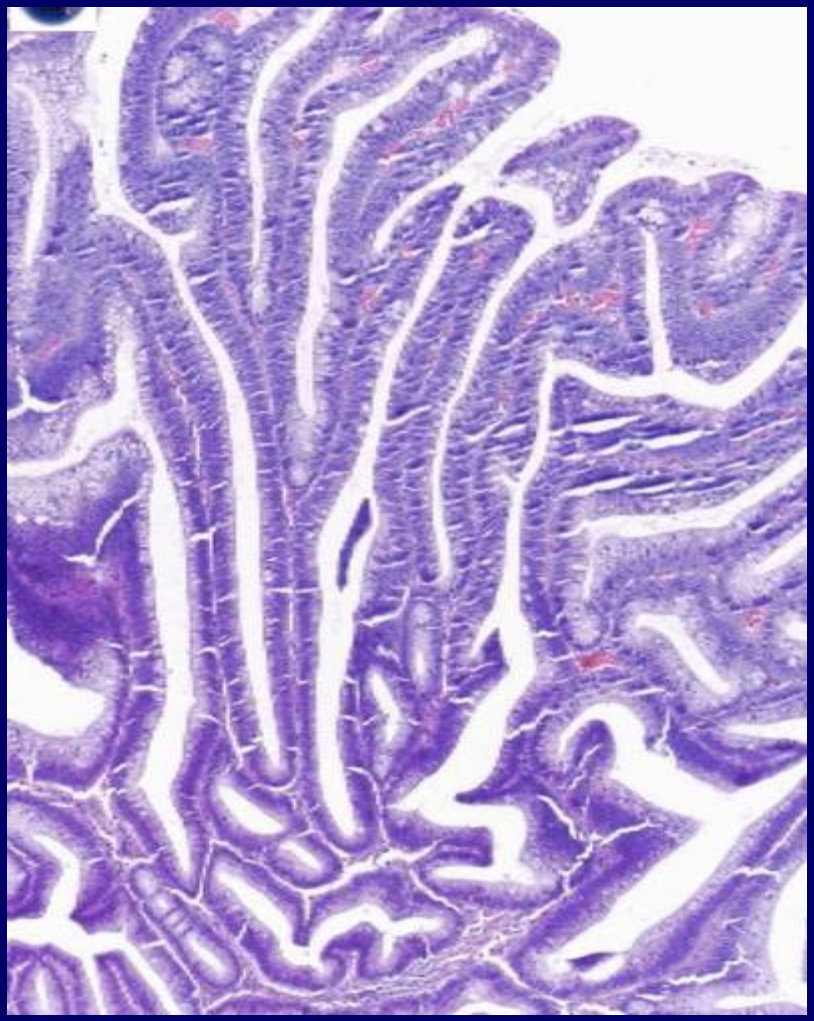


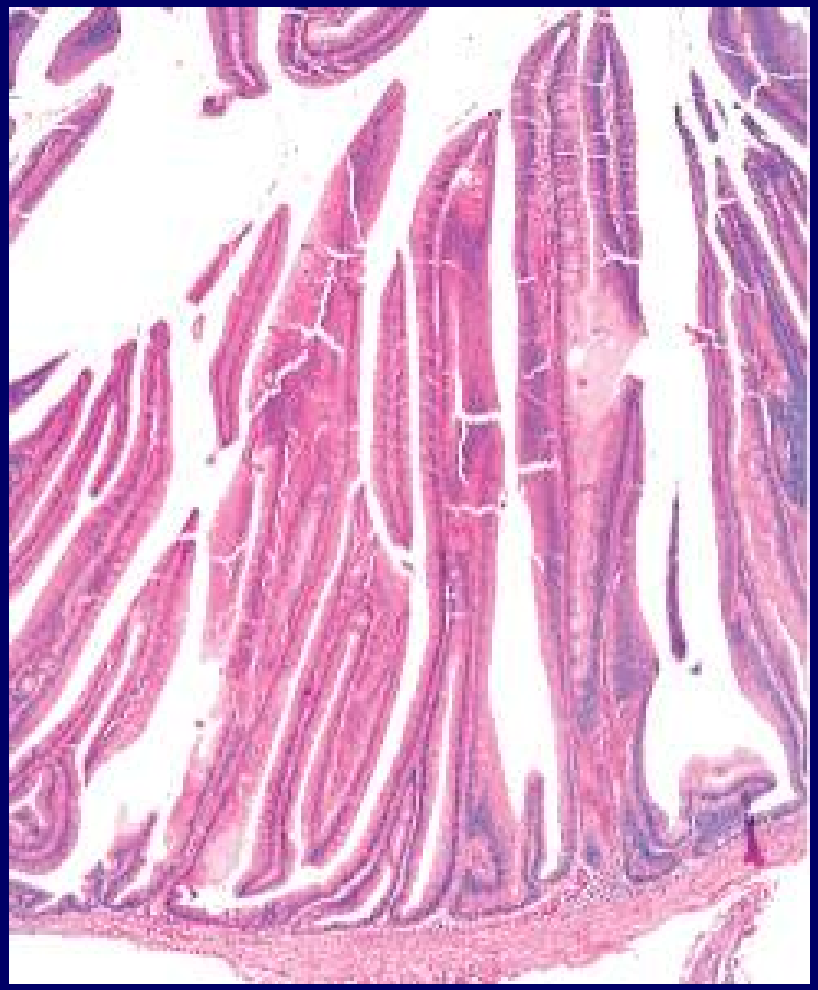


VILLOUS ADENOMA



VILLOUS ADENOMA





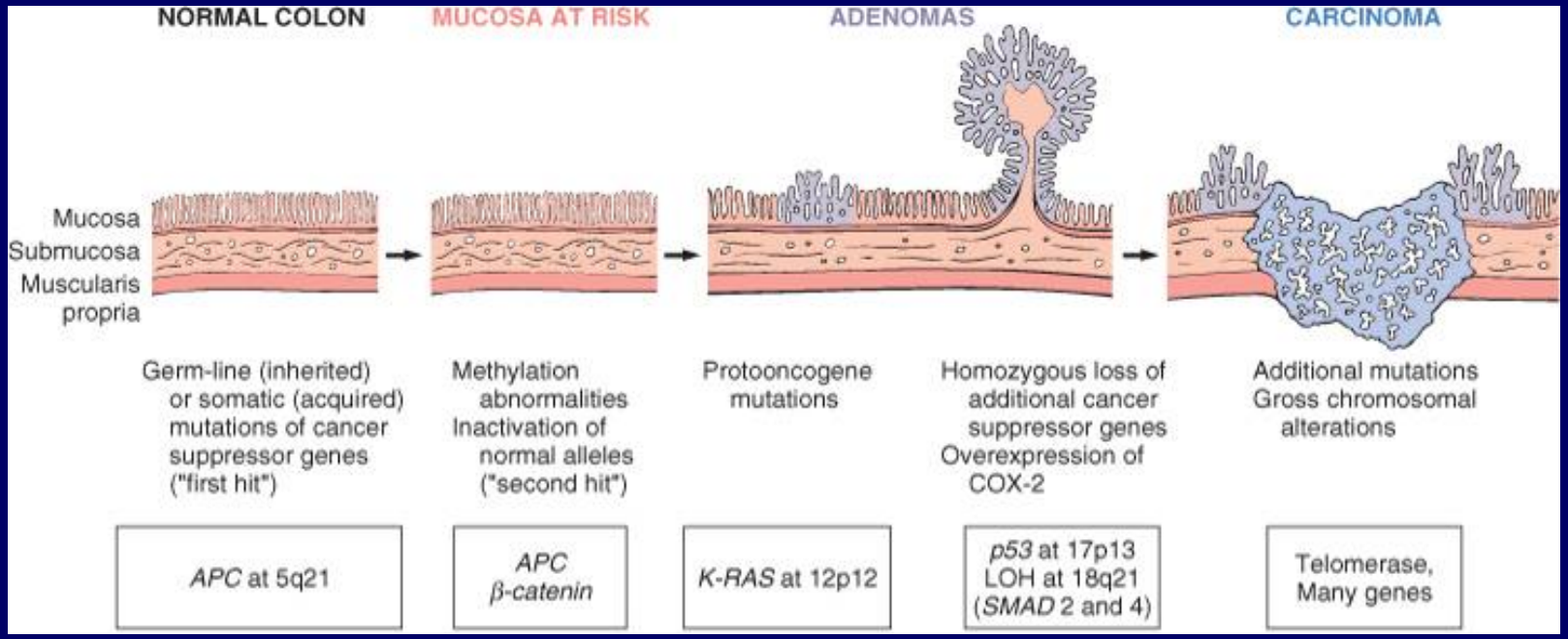
COLORECTAL CARCINOMA

- Sporadic carcinomas occur from adenomas: *adenoma-carcinoma sequence*

- characterized by chromosomal instability that results in stepwise accumulation of mutations in a series of oncogenes and tumor suppressor genes

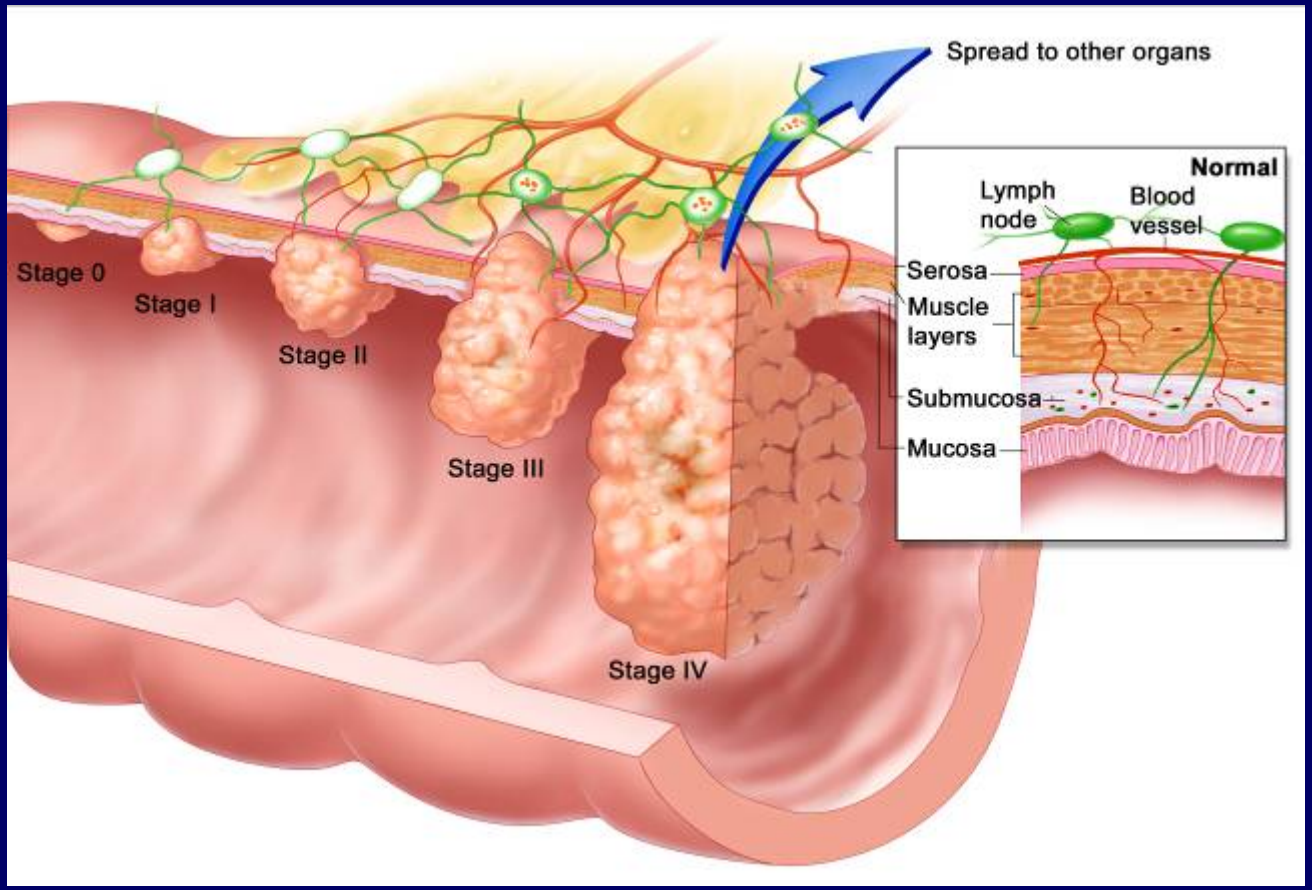
adenoma-carcinoma sequence

- the molecular evolution of colon cancer -several stages.
- initially, there is localized colon epithelial proliferation.
- followed by the formation of small adenomas that progressively enlarge, become more dysplastic, and ultimately develop into invasive cancers

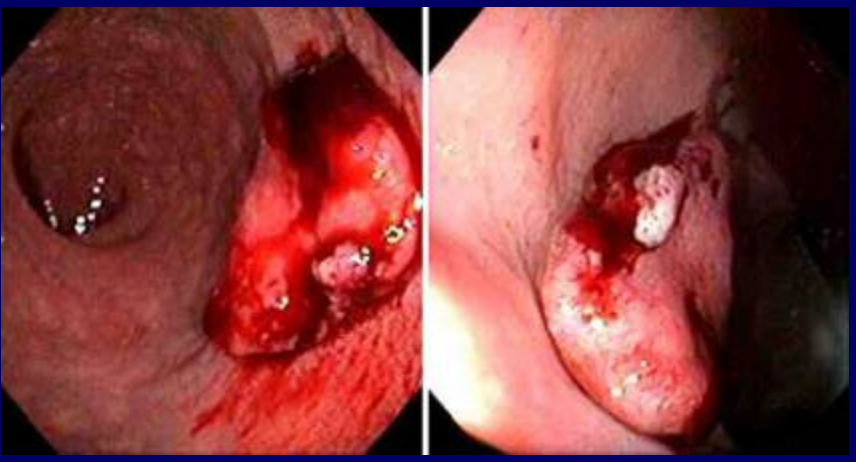


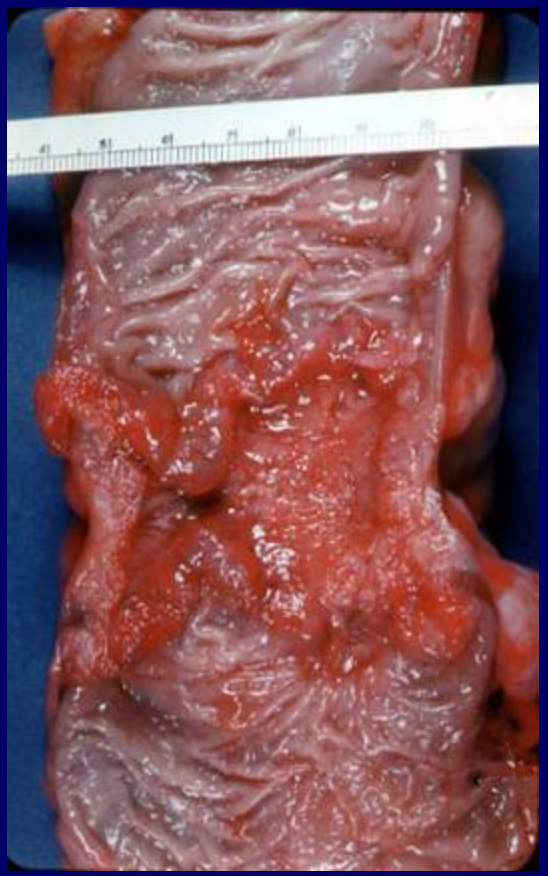
Colorectal carcinoma

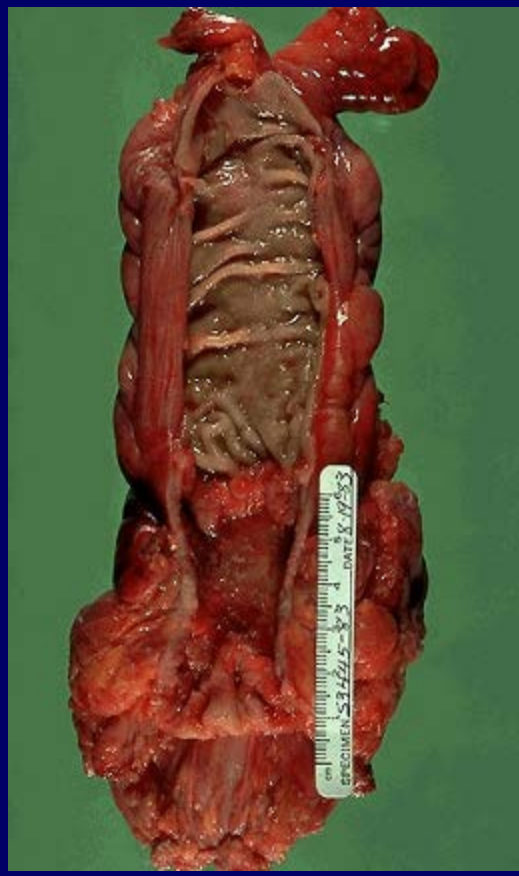
The single most important prognostic indicator : extent of the tumor at the time of diagnosis (TNM stage)



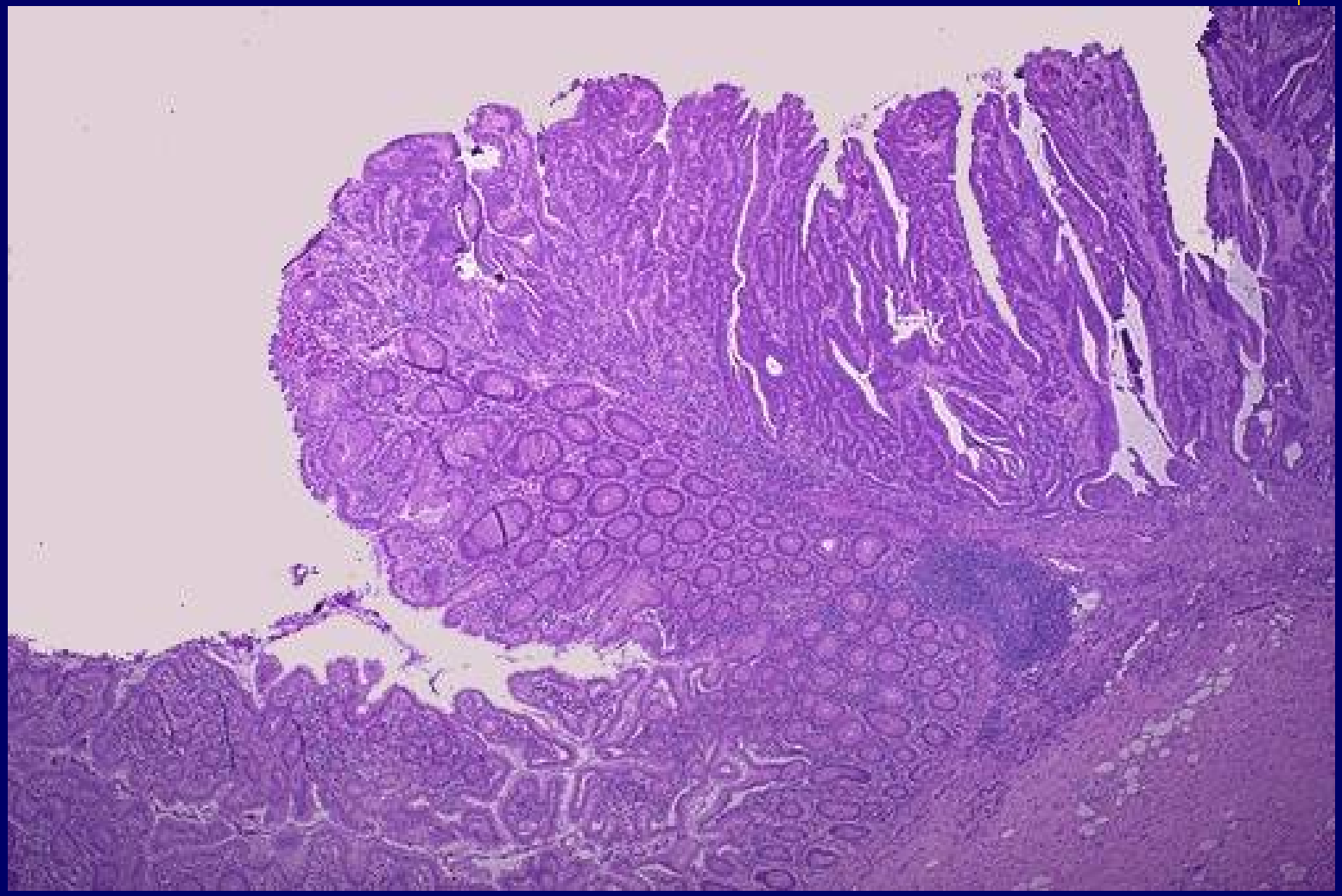
Colorectal adenocarcinoma



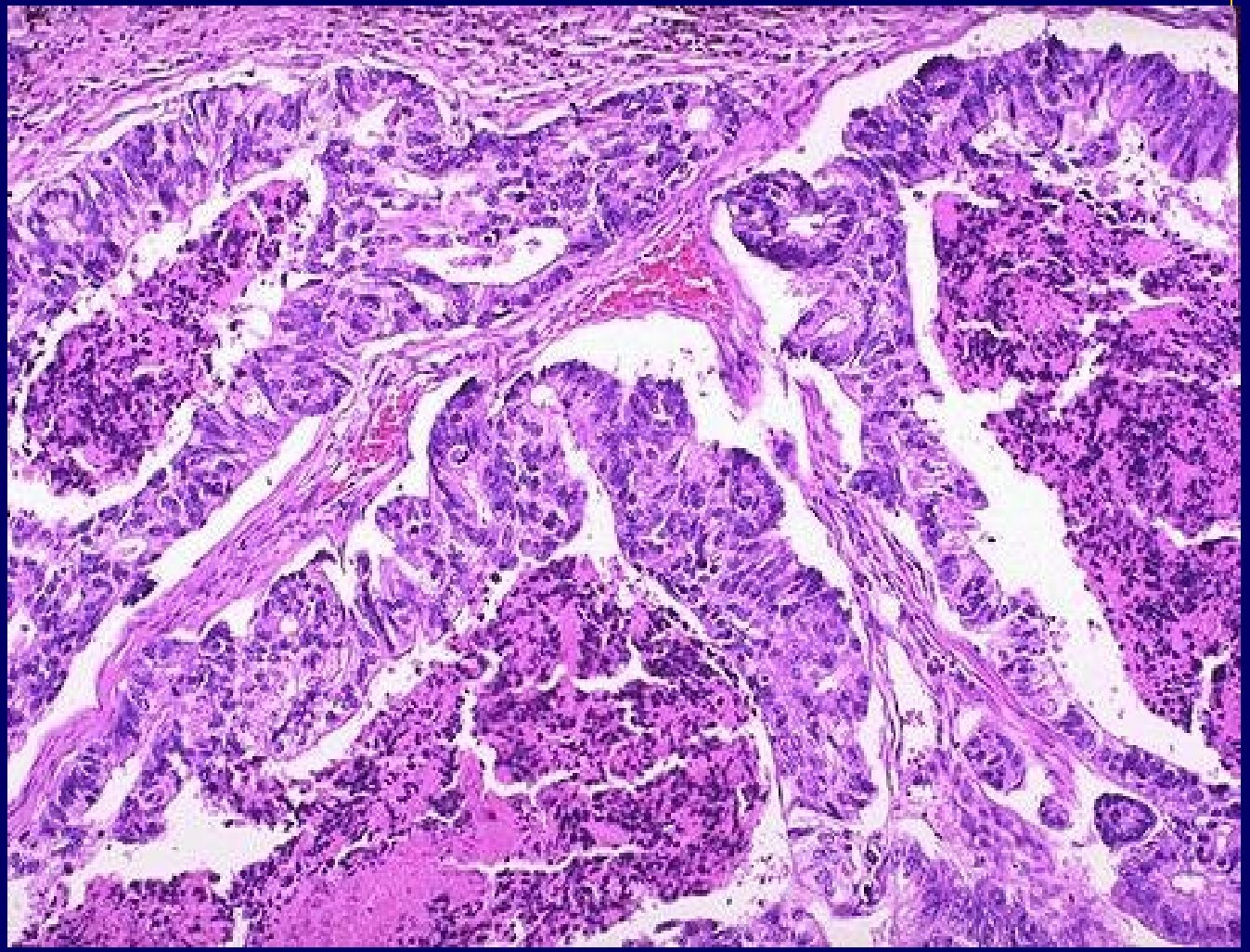




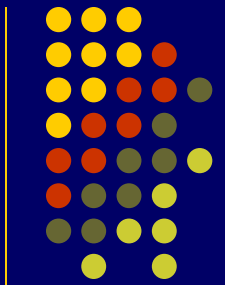
Colorectal adenocarcinoma



Colorectal adenocarcinoma



Colorectal carcinoma



- challenge is to discover these neoplasms when curative resection is possible - adenomatous polyps.
- death from colonic cancer - preventable