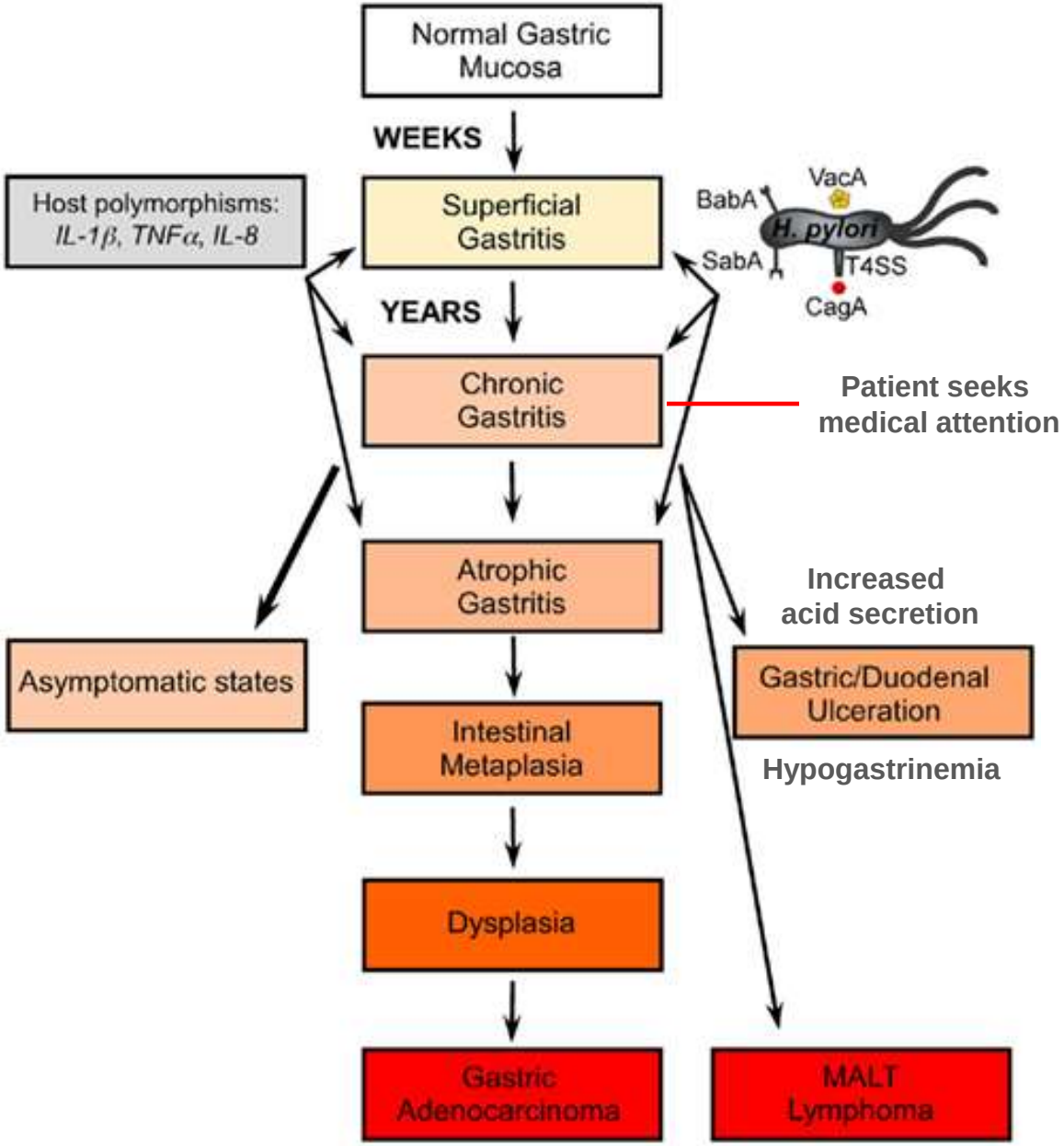
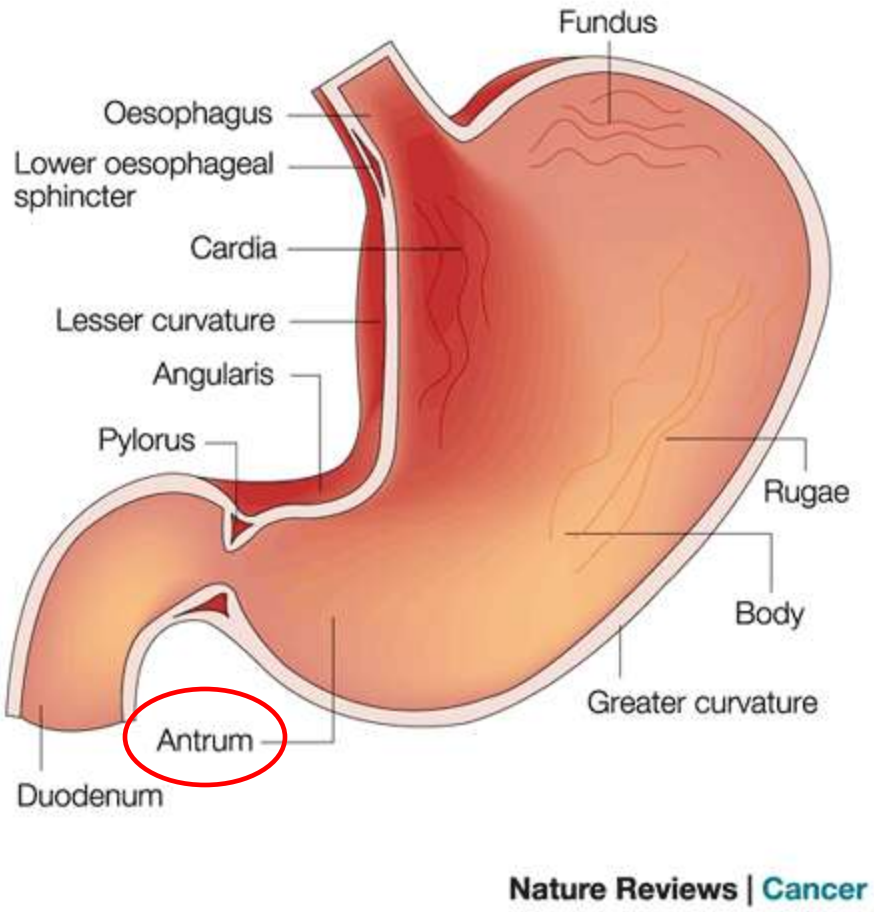


H. pylori Gastritis

Acute: insufficient symptoms to require medical attention

Associated with poor hygiene (poverty, overcrowding…etc.)

Pathogenicity:
- Flagella
- Urease (ammonia pH)
- Adhesins
- Toxins (CagA)



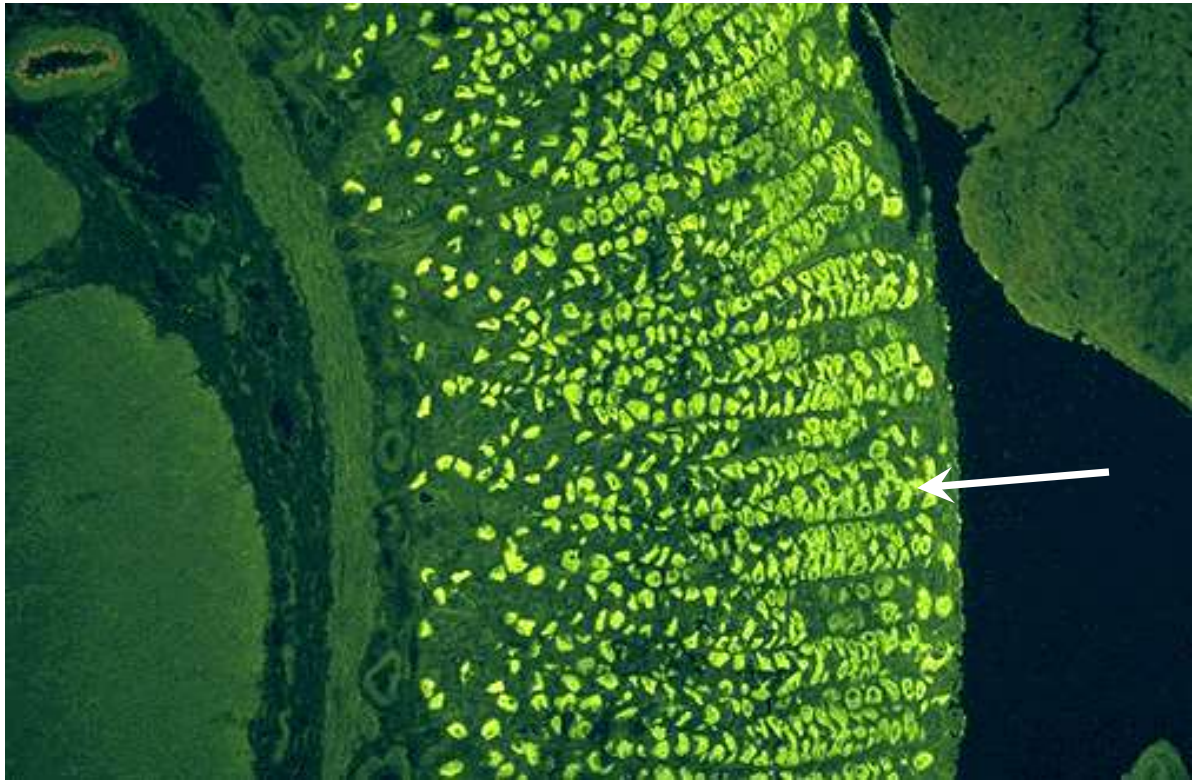
H. pylori Gastritis

Not present in acid producing mucosa of gastric body, duodenum, or areas of intestinal metaplasia

Dx:
- Biopsy antrum
- Serological (Ab)
- Fecal detection
- Urea breath test

Tx:
Antibiotics+PPI

Relapse/reinfection



Autoimmune Gastritis

Antrum spared but with G cell hyperplasia → Hypergastrinemia

Antibodies to parietal cells and intrinsic factor → Achlorhydria & pernicious anemia

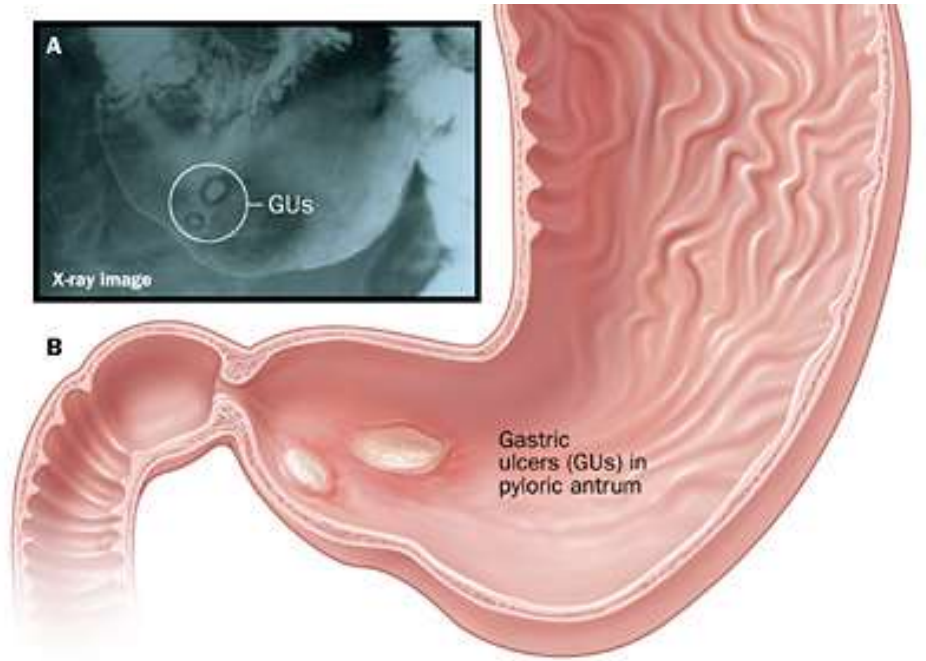
Reduced serum pepsinogen I levels (chief cell loss)

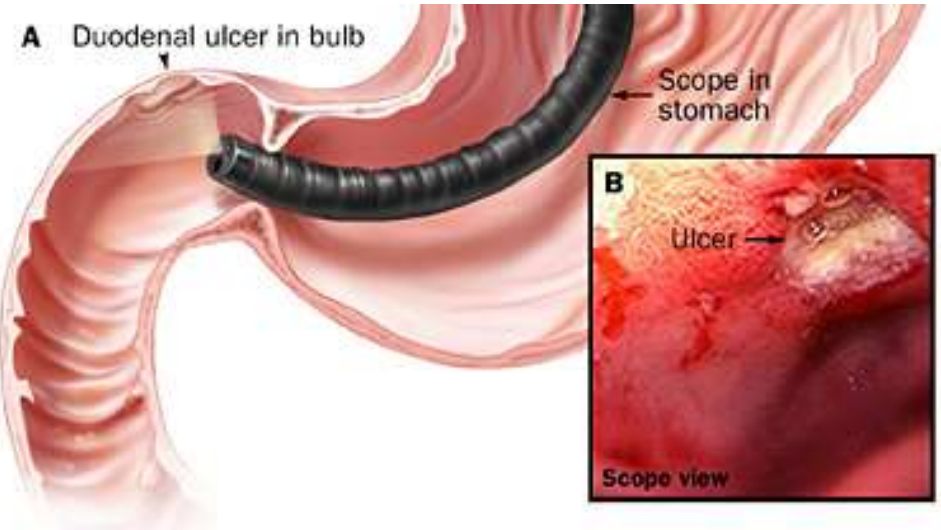
Atrophy seen as loss of rugal folds

Autoimmune vs H.pylori Gastritis

Feature	*H. pylori*–Associated	Autoimmune
Location	Antrum	Body
Inflammatory infiltrate	Neutrophils, plasma cells	Lymphocytes, macrophages
Acid production	Increased to slightly decreased	Decreased (achlorhydria*)
Gastrin	Normal to decreased	Increased (hypergastrinemia)
Other lesions	Hyperplastic/inflammatory polyps	Neuroendocrine hyperplasia (antrum)
Serology	Antibodies to *H. pylori*	Antibodies to parietal cells (H^+,K^+-ATPase, intrinsic factor)
Sequelae	Peptic ulcer, adenocarcinoma, lymphoma	Atrophy*, pernicious anemia (B_{12}-IF), adenocarcinoma, carcinoid tumor
Associations	Low socioeconomic status, poverty, residence in rural areas	Autoimmune disease; thyroiditis, diabetes mellitus, Graves disease

*diffuse damage of the oxyntic (acid-producing) mucosa within the body and fundus





more common

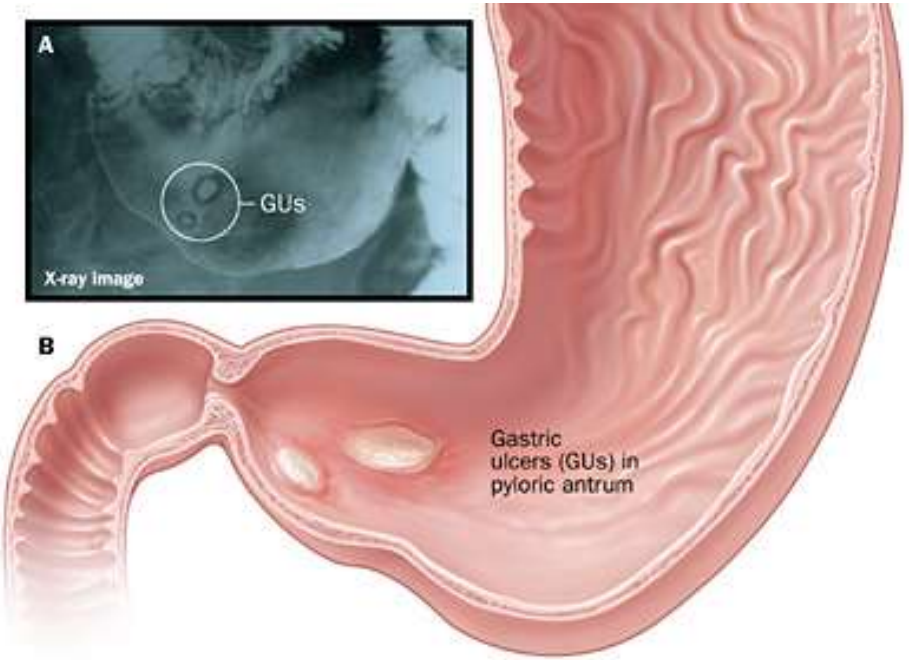
Peptic Ulcer Disease

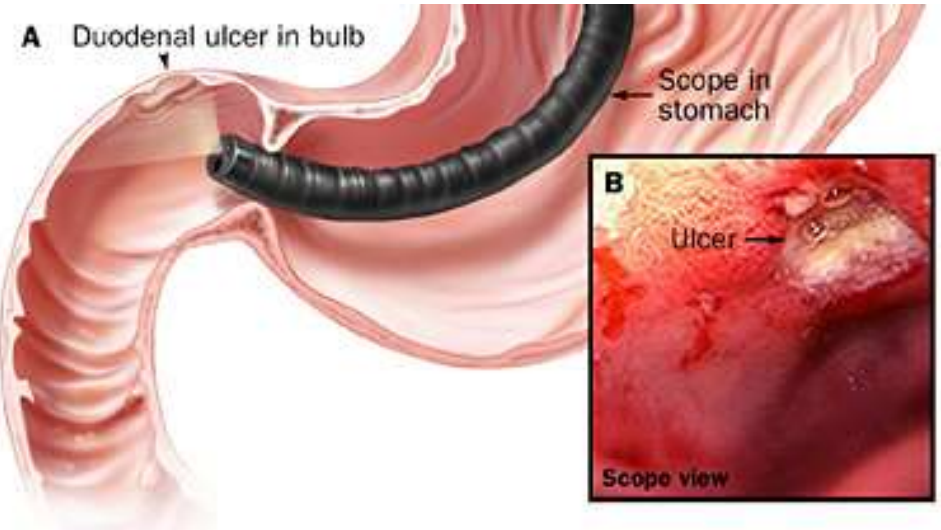
Same deficiencies in mucosal defences as chronic gastritis + hyperacidity

More common in ♂

Any part of the GIT exposed to acid, commonly in:
- Proximal duodenum
- Antrum

Remember GERD, ectopia and heteropia





more common

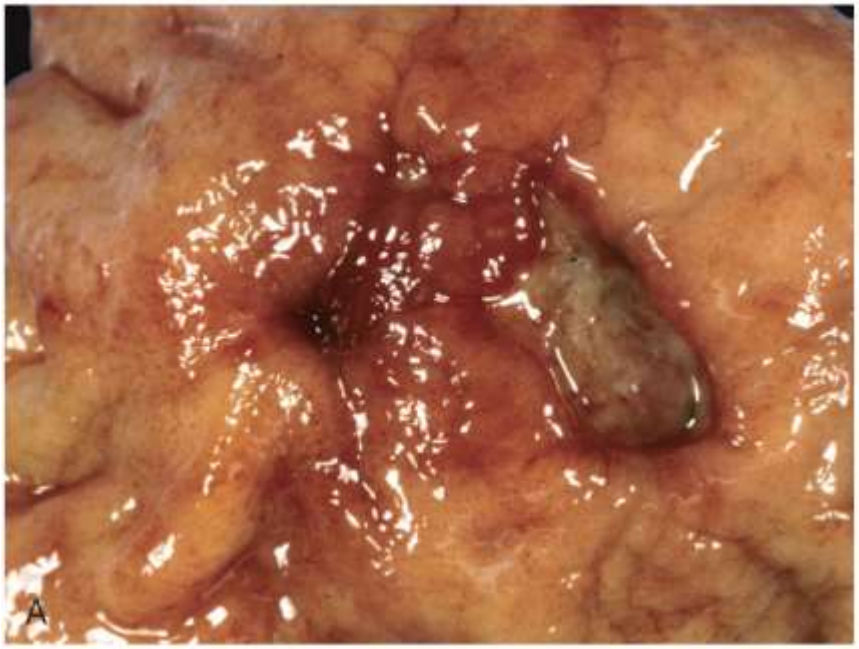
Peptic Ulcer Disease

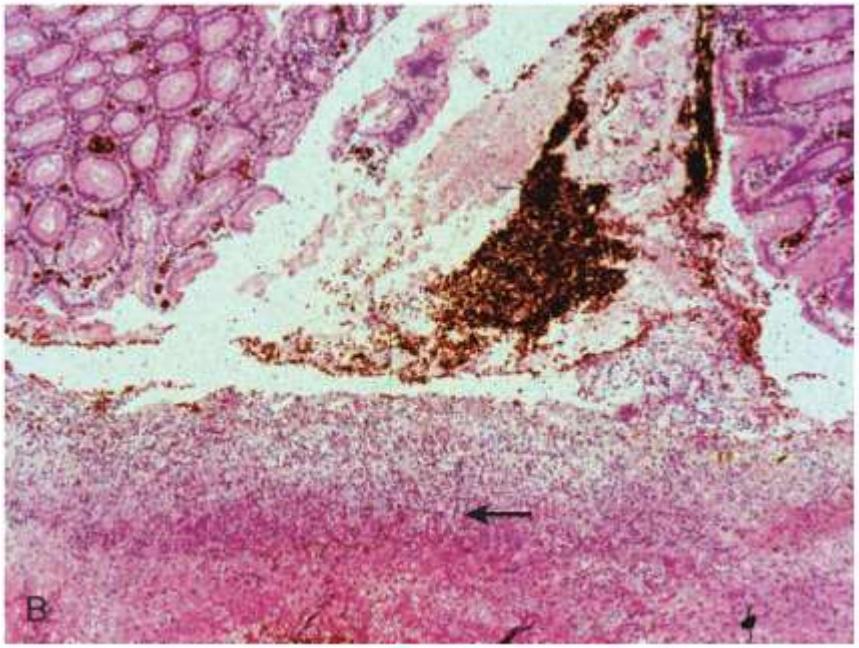
Associated with:

- H.pylori
- NSAIDs (PGs)

- Steroids/ COPD (PGs)
- Smoking (blood flow)
- Alcoholic cirrhosis
- Hyperparathyroidism
- CRF (↑Ca → ↑Gastrin)
- Psychological stress

- Zollinger-Ellison synd. (tumor/gastrin)





Peptic Ulcer Disease

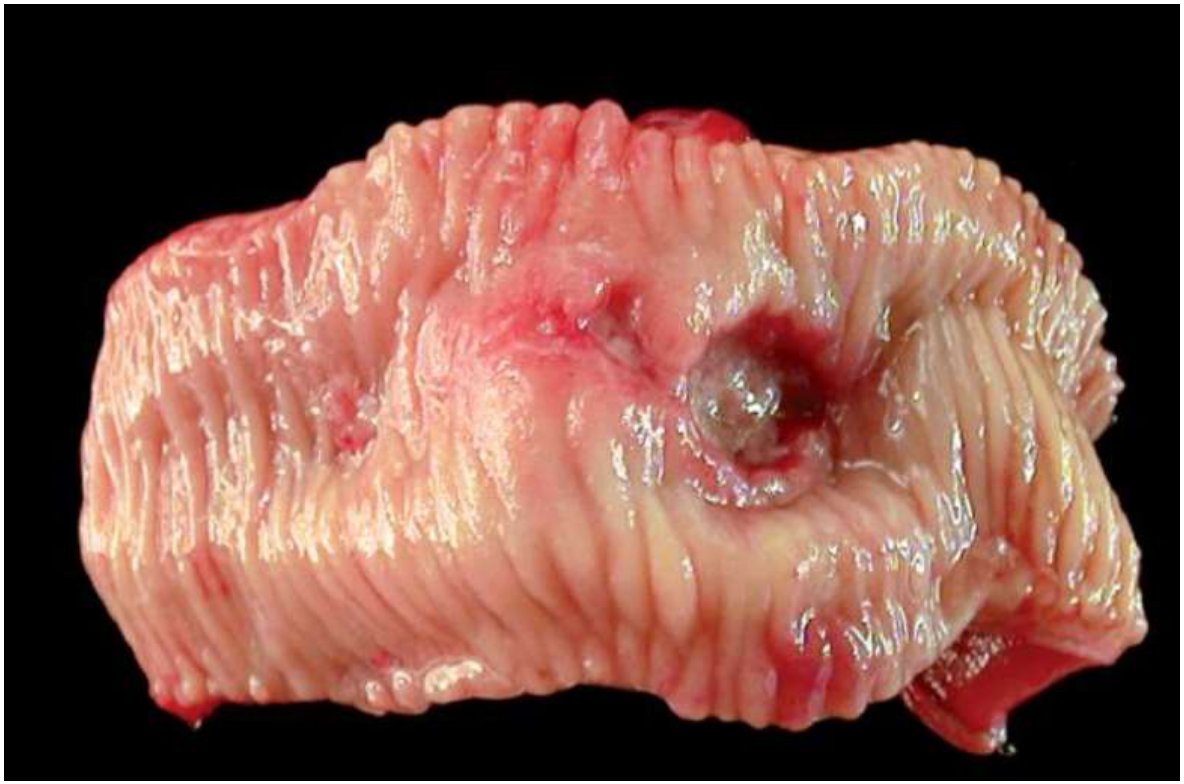
Typically solitary

Classically a round to oval sharp punched out defect

Clean base (digestion) (A)

Richly vascular granulation tissue seen on histology (B)

Complications:
- Bleeding
- Perforation
- Iron deficiency anemia



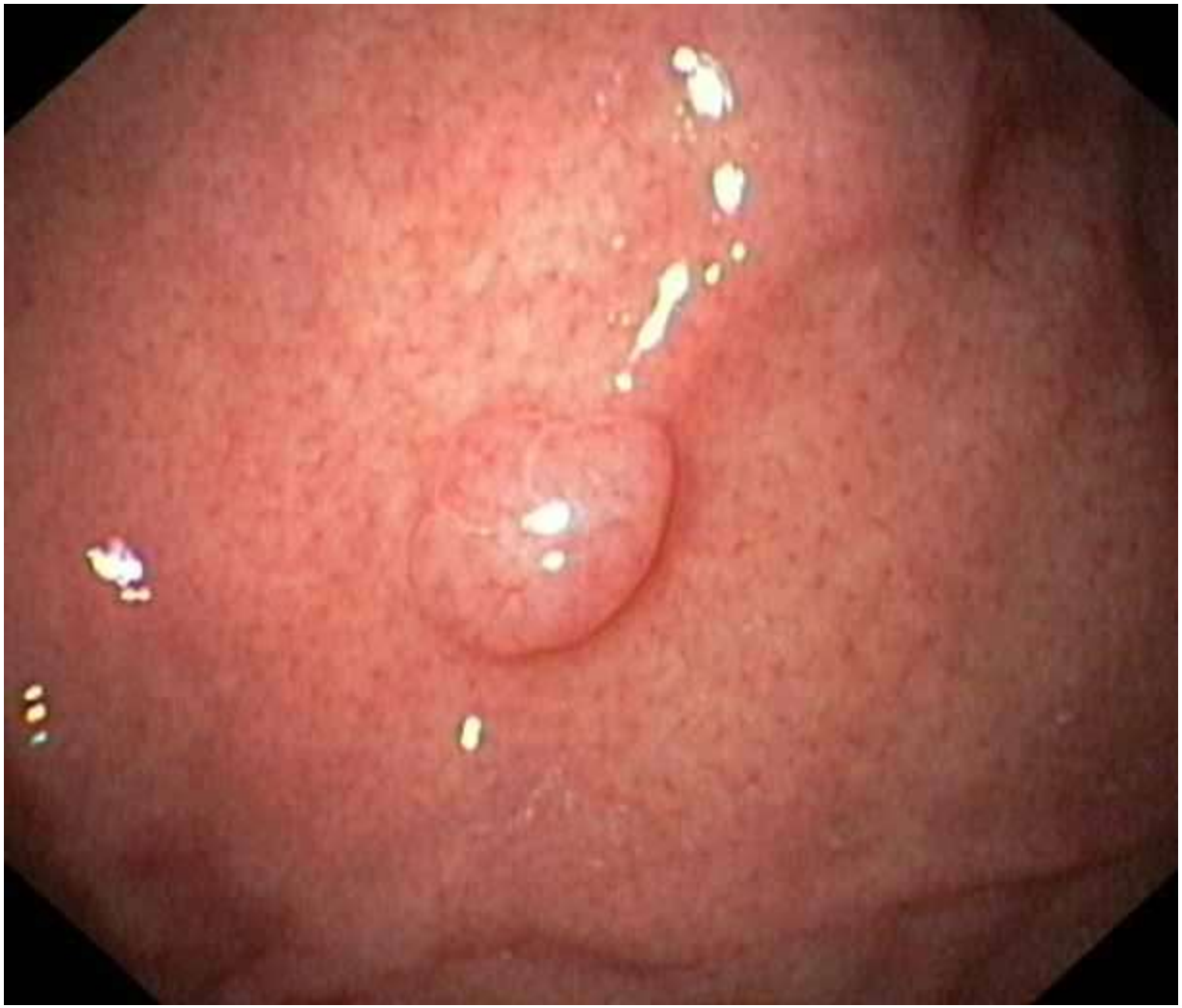
Peptic Ulcer Disease

Clinical features:
- Epigastric burning/pain
  1 to 3 hours after meals
  Worse at night
  Relieved by alkali/food
- N/V, bloating, belching
- Complications

Tx: H.Pylori eradication + PPI

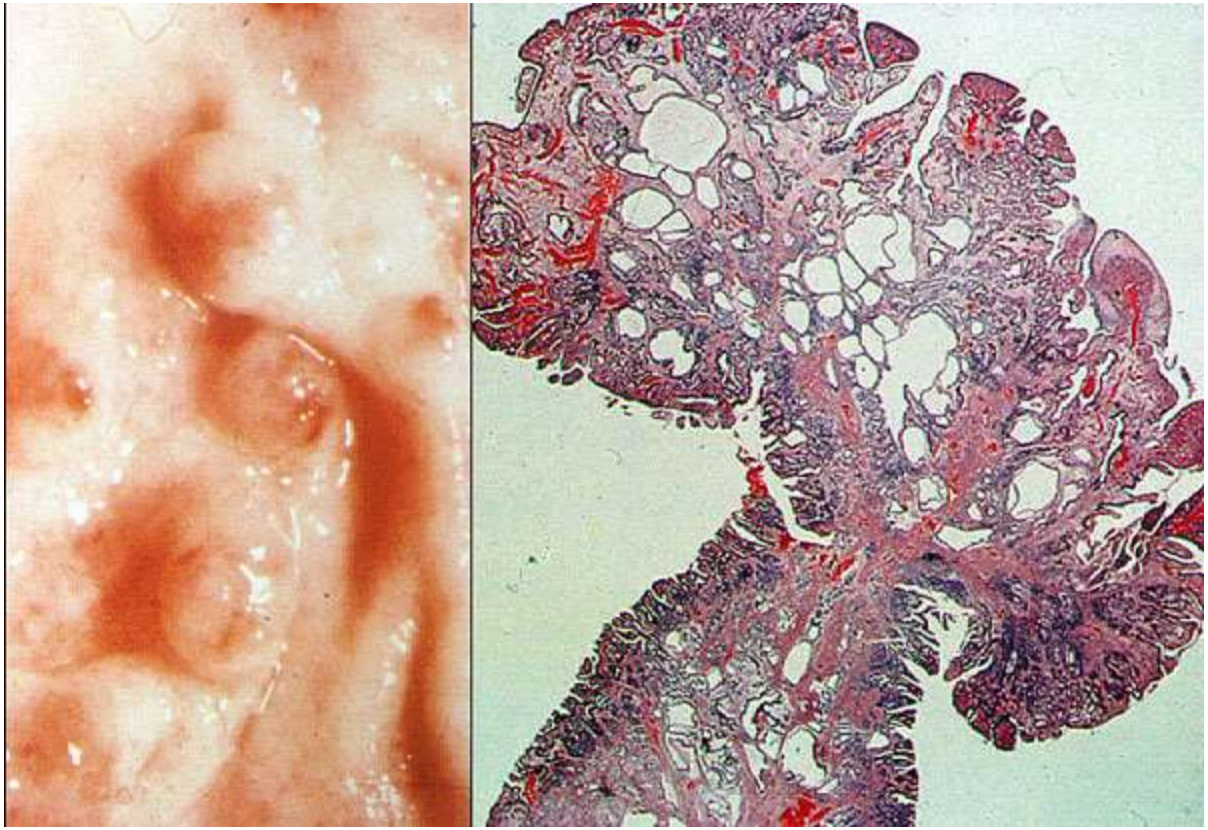
Bleeding/perforation can occur requiring surgery

PUD morbidity>mortality



Gastric Polyps

- Hyperplasia
- Inflammation
- Ectopia
- Neoplasia



irregular, cystically dilated, and elongated foveolar glands

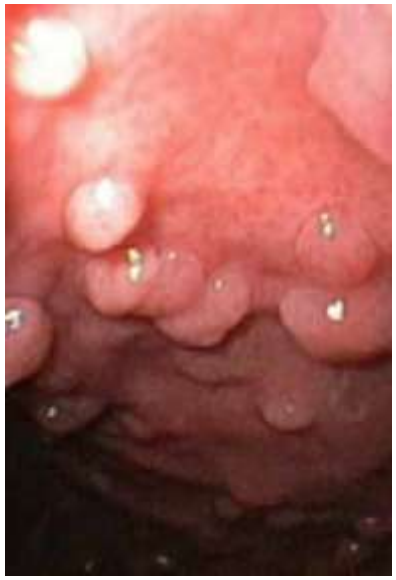
Gastric Polyps

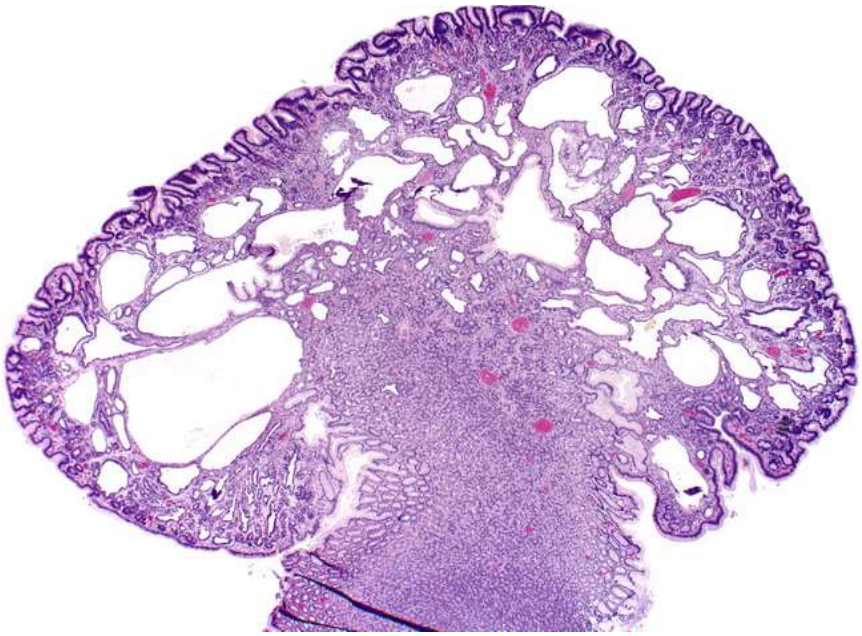
Inflammatory & Hyperplastic Polyps

- Older age, 50-60yrs
- Background of chronic gastritis
- Typically multiple
- Ovoid
- Typically <1cm
- Smooth surface

Dysplasia correlates with size (>1.5cm)

Gastric Polyps



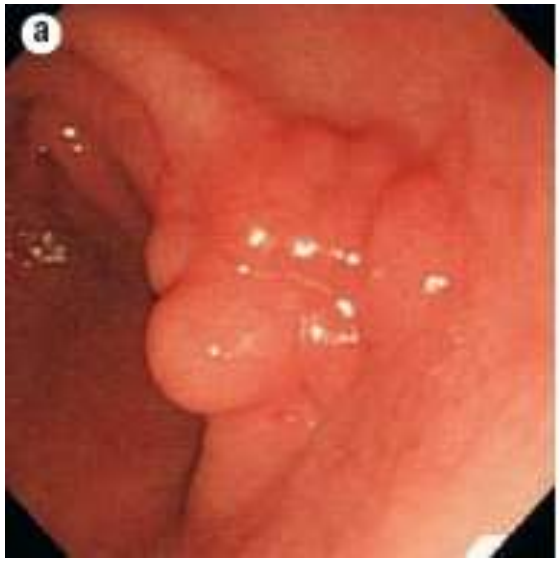


Cystically dilated, irregular glands lined by flattened parietal and chief cells

Fundic Gland Polyps

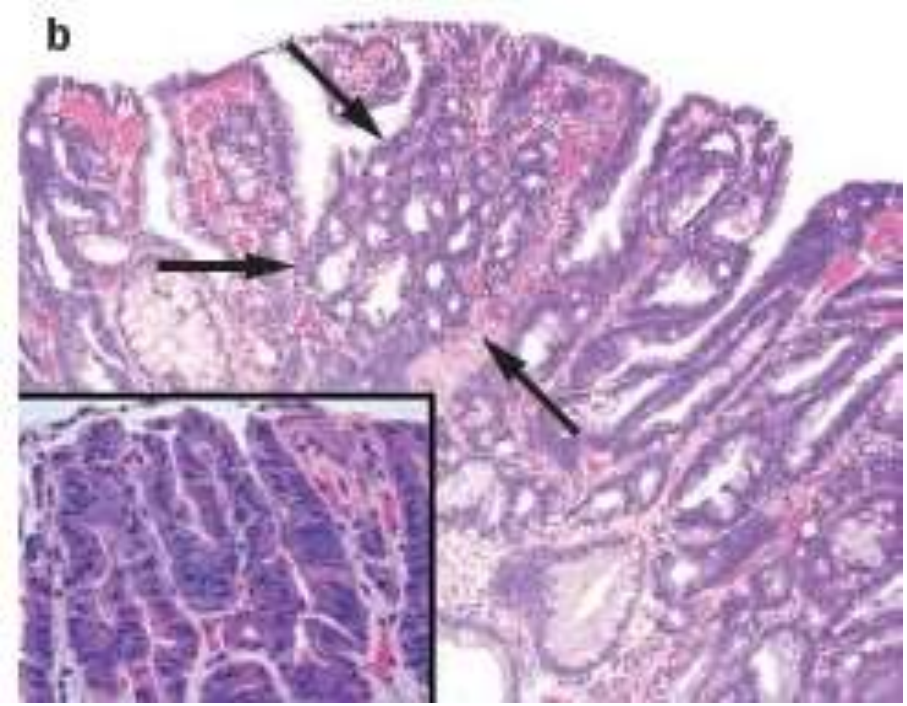
- Sporadic or with FAP
- No neoplastic potential
- Increased incidence with PPI use
- Multiple
- Well-circumscribed
- Body/Fundus

Asymptomatic or N/V, epigastric pain



Intestinal-type columnar epithelium, crowded, pseudostratification

High grade characterized by cribriform structure (arrows)

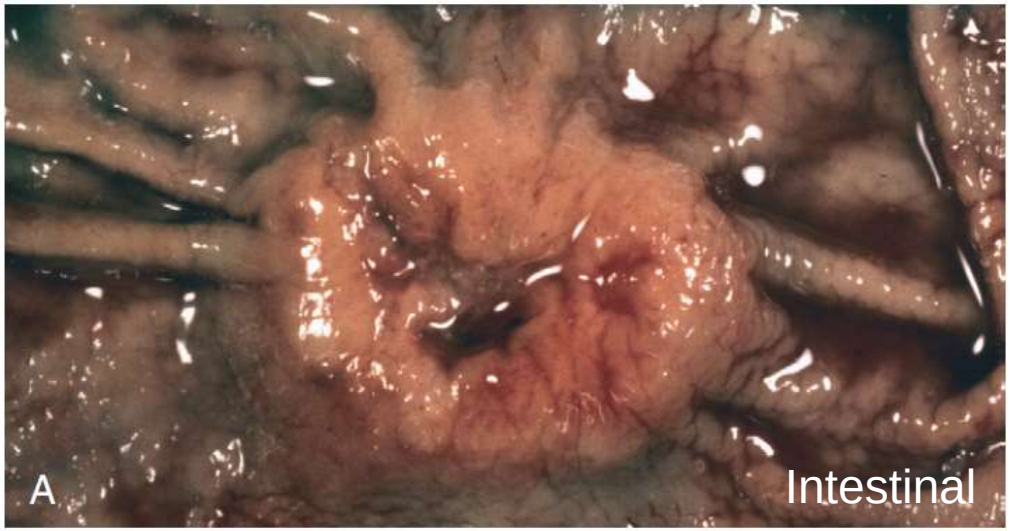


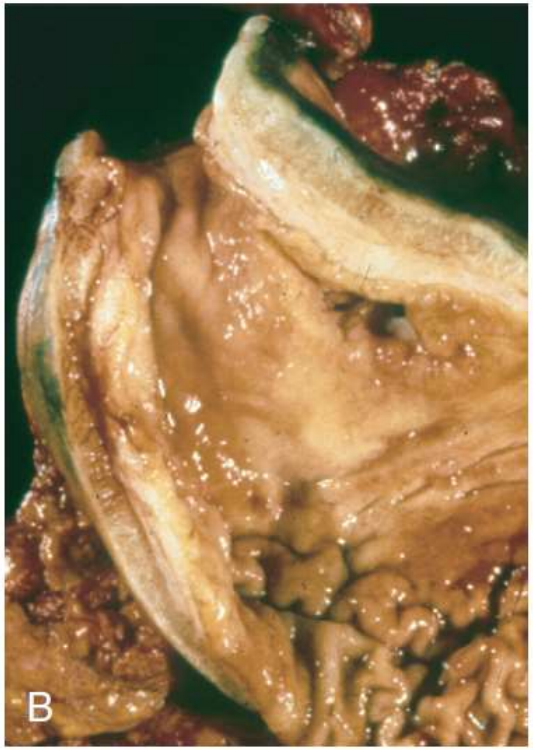
Gastric Polyps

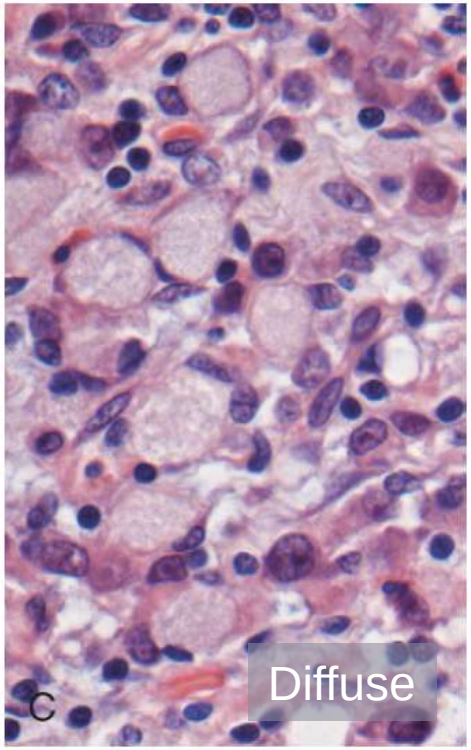
Gastric Adenoma

- Increased incidence with age, 50-60yrs
- Background of chronic gastritis + atrophy + intestinal metaplasia
- Commonly in Antrum

Adenocarcinoma risk correlates with size (>2cm)







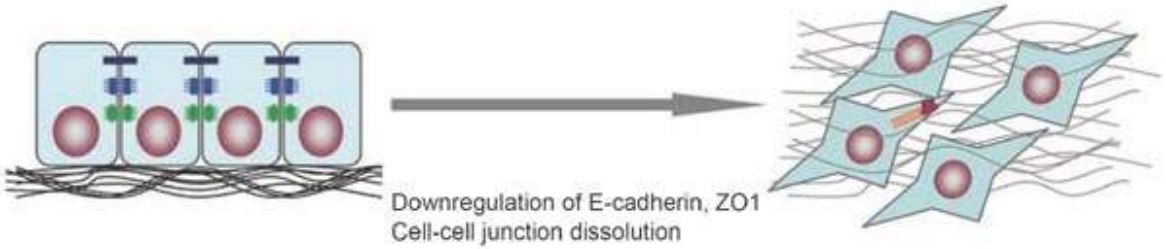
Gastric Adenocarcinoma

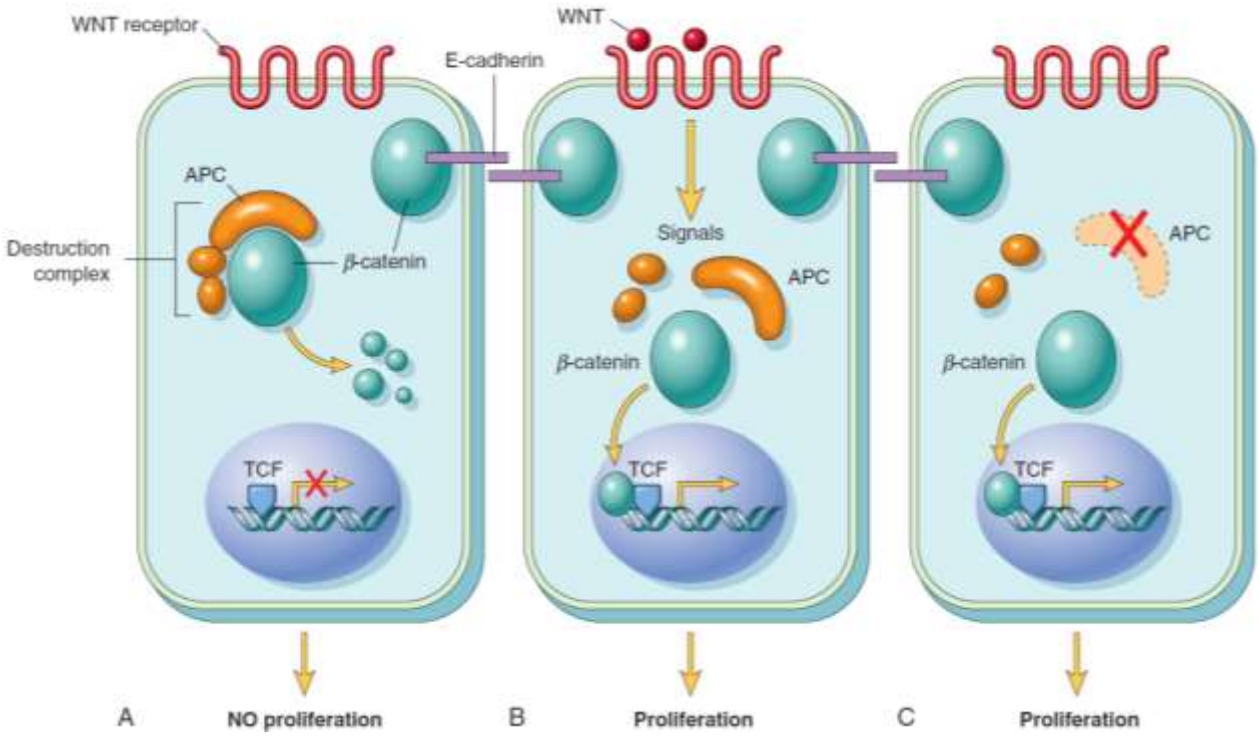
The most common malignancy of the stomach

Non specific early stage symptoms, similar to chronic gastritis

Low incidence regions → late presentation:

- weight loss
- anorexia
- altered bowel habits
- anemia
- hemorrhage





Gastric Adenocarcinoma

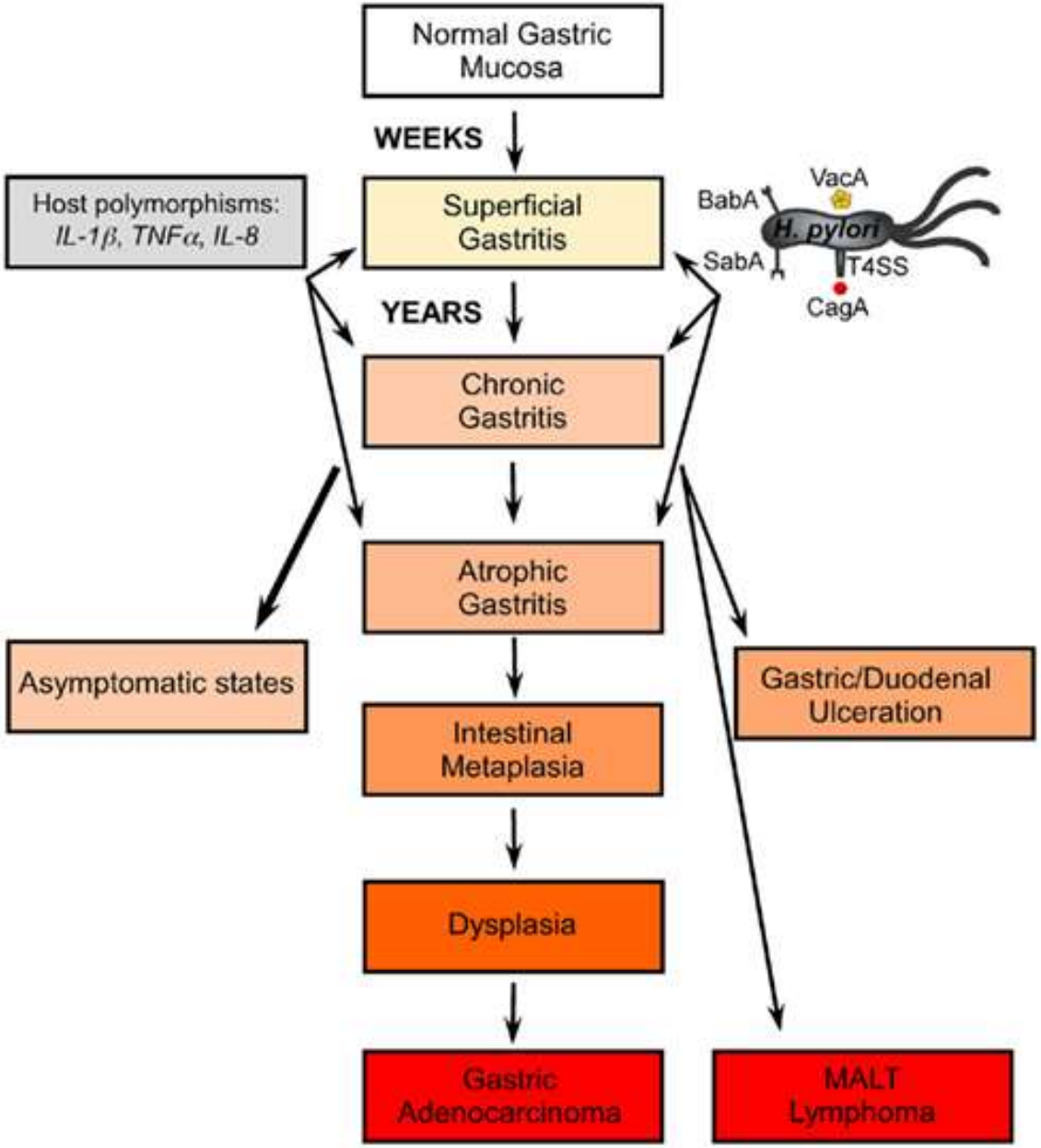
Pathogenesis

CDH1 (E-Cadherin) mutation/methylation in diffuse-type

Germline APC mutations (FAP) patients have increased risk of intestinal-type

Sporadic intestinal-type:

- β-catenin mutations
- Microsatellite instability
- Hypermethylation (*TGFβR, BAX, IGFRII, p16/INK4a*)



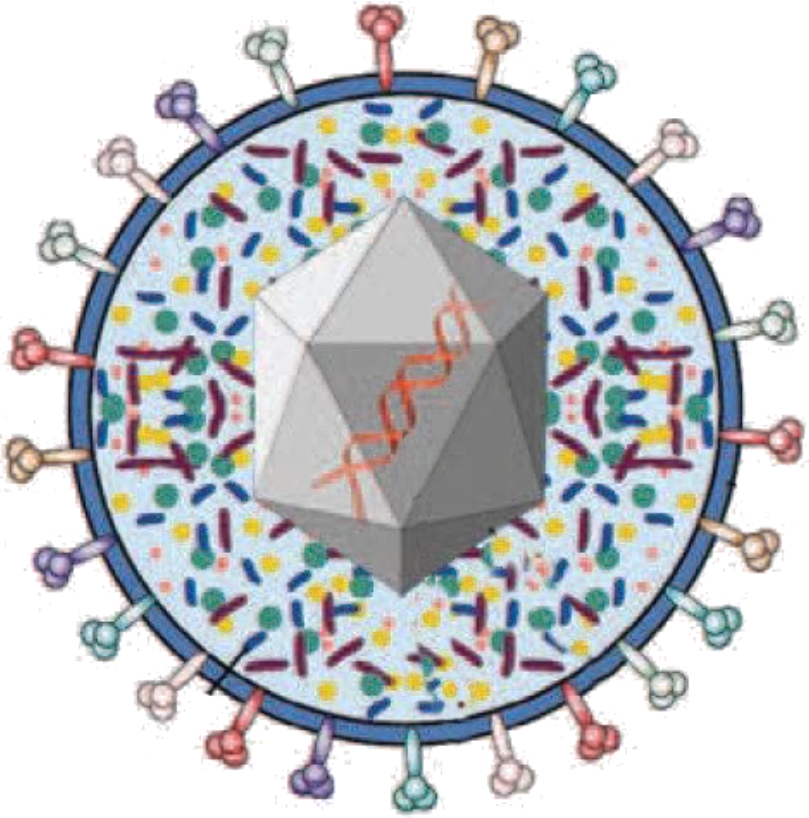
Gastric Adenocarcinoma

Pathogenesis

H. pylori

Increased production of proinflammatory proteins (host polymorphisms increasing them further)

Increased risk of chronic gastritis associated intestinal-type gastric cancer



Gastric Adenocarcinoma

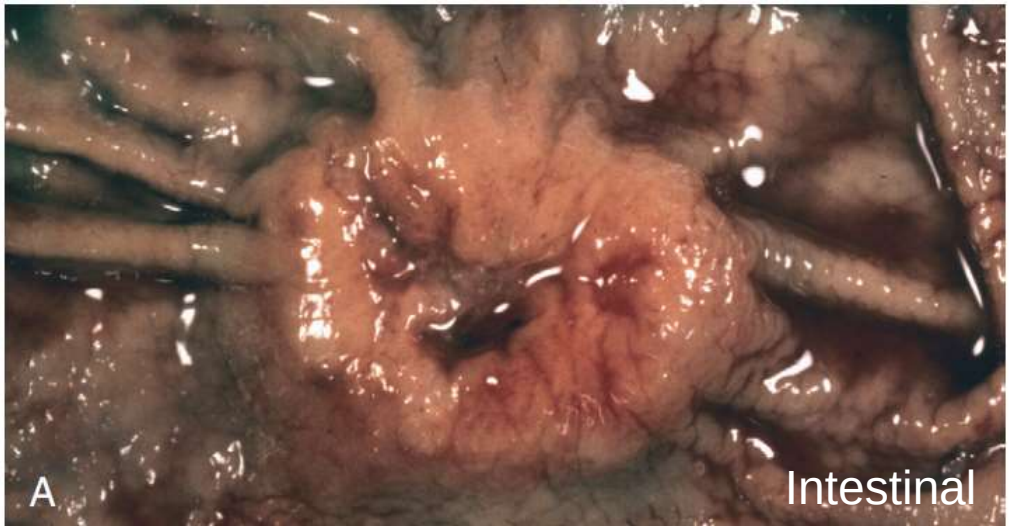
Pathogenesis

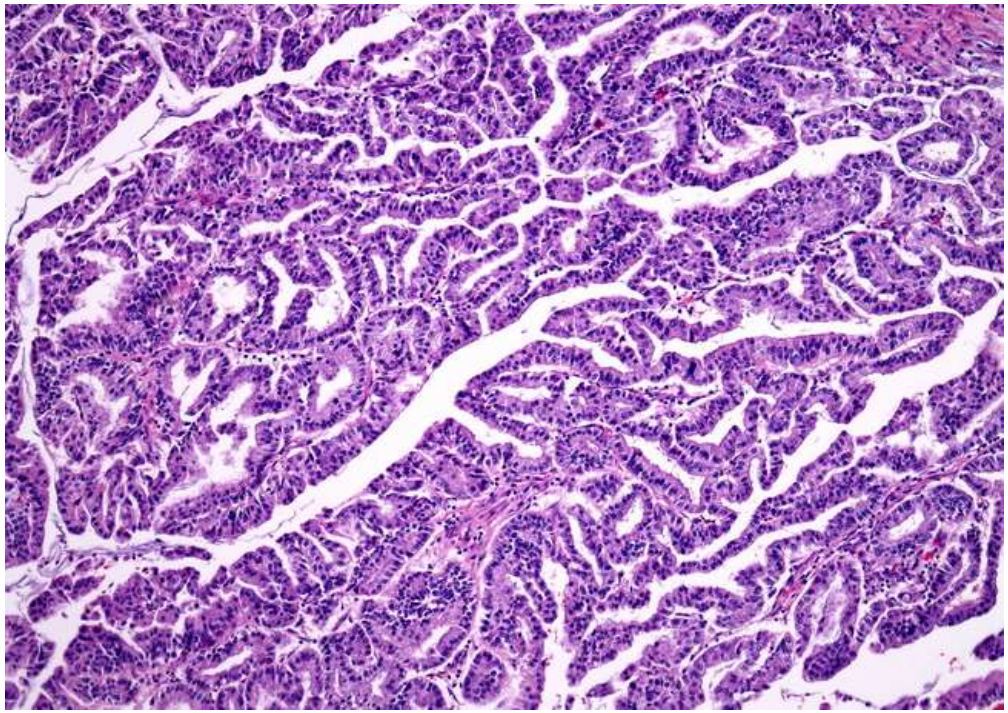
EBV

No *TP53* mutations (distinct molecular pathology, but still undefined)

Proximal stomach

Diffuse morphology with marked lymphocytic infiltrate





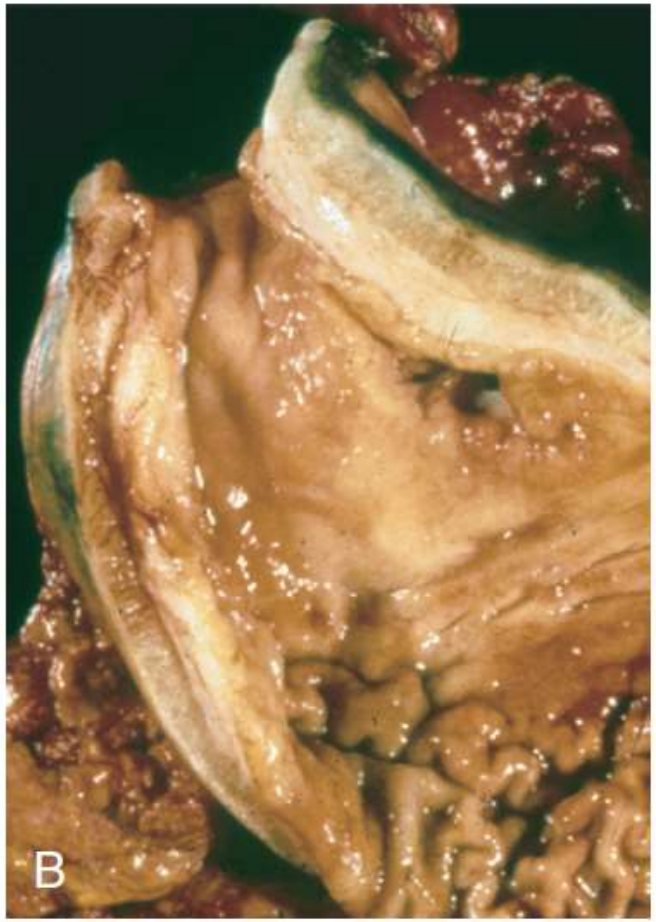
Gastric Adenocarcinoma

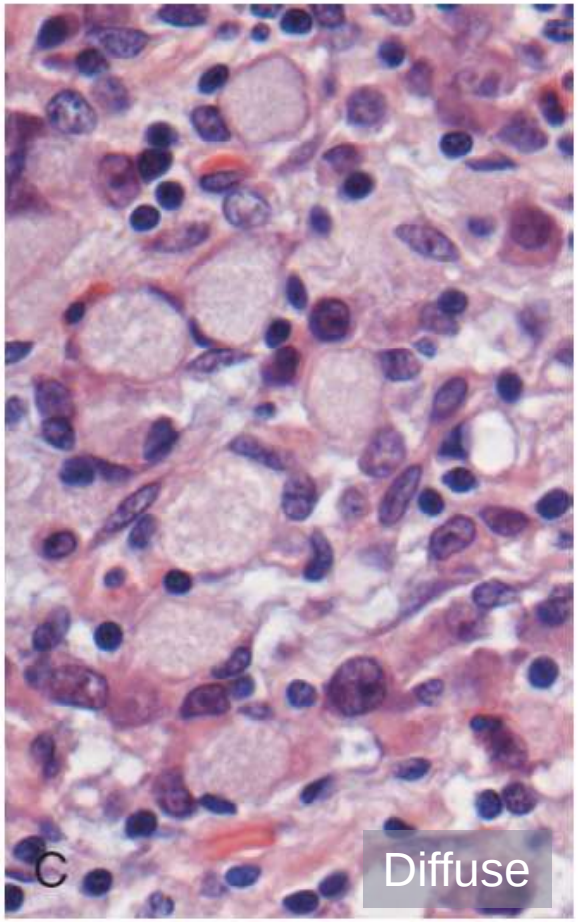
Morphology

Intestinal-type

- Bulky lesions exophytic mass or ulcerated tumor
- glandular structures
- Neoplastic cells have apical mucin vacuoles

Gastric Adenocarcinoma



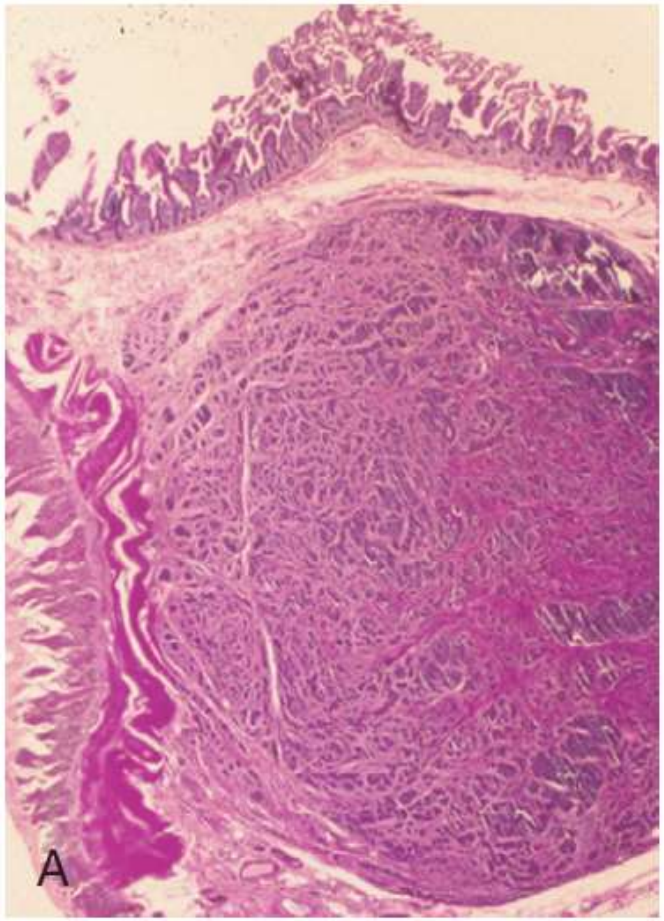


Morphology

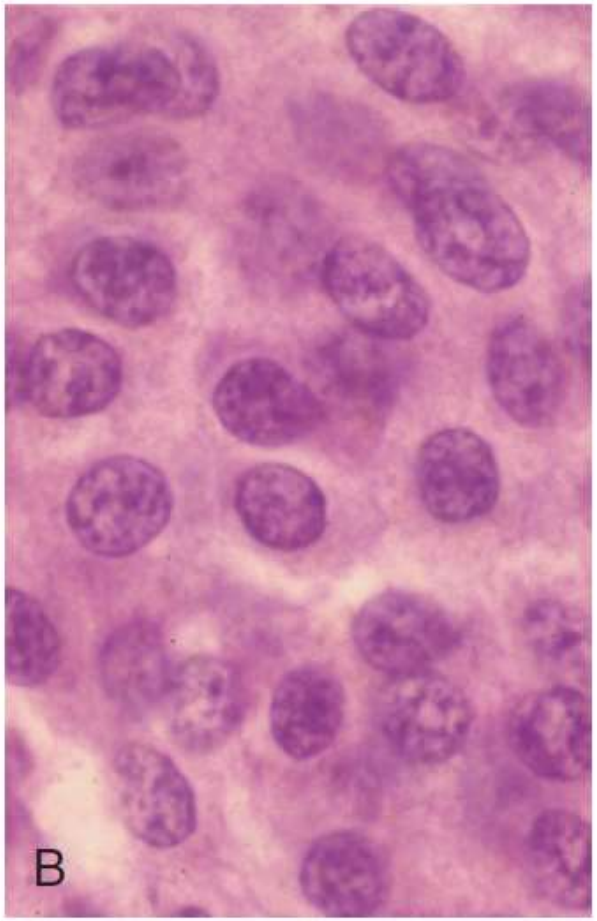
Diffuse-type

- Infiltrative growth
- Discohesive cells
- Large mucin vacuoles **(signet ring cell)**

A mass may be difficult to appreciate in diffuse gastric cancer, but desmoplasia can stiffen the gastric wall **(linitis plastica)**



Submucosal polypoid lesion



Uniform cells
Little pink granular cytoplasm
Round/oval stippled nucleus

Carcinoid Tumor

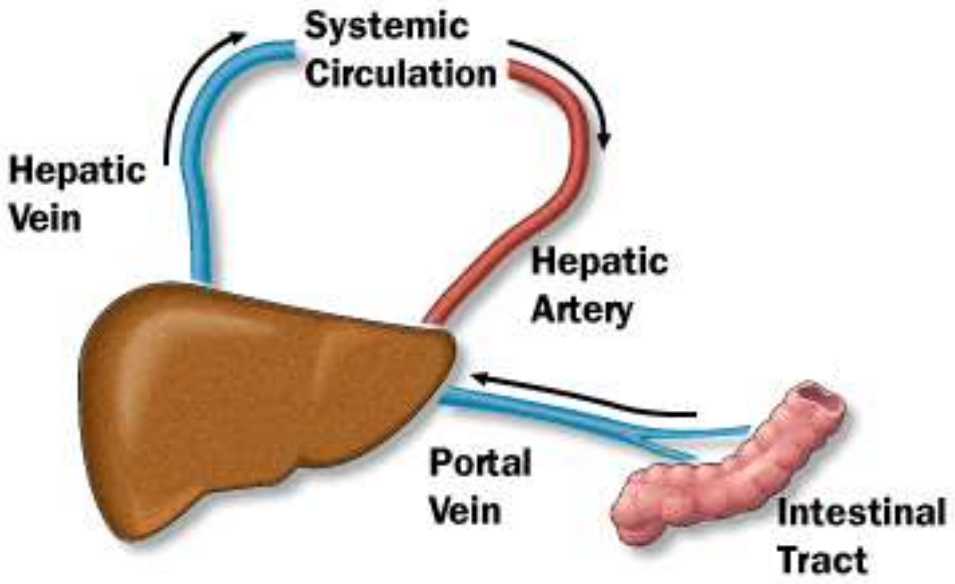
Neuroendocrine organs/cells

Slow growing

Locations
- GI (SI)
- Tracheobronchial tree
- Lungs

Intense desmoplasia (obstruction)

When high-grade termed neuroendocrine carcinoma

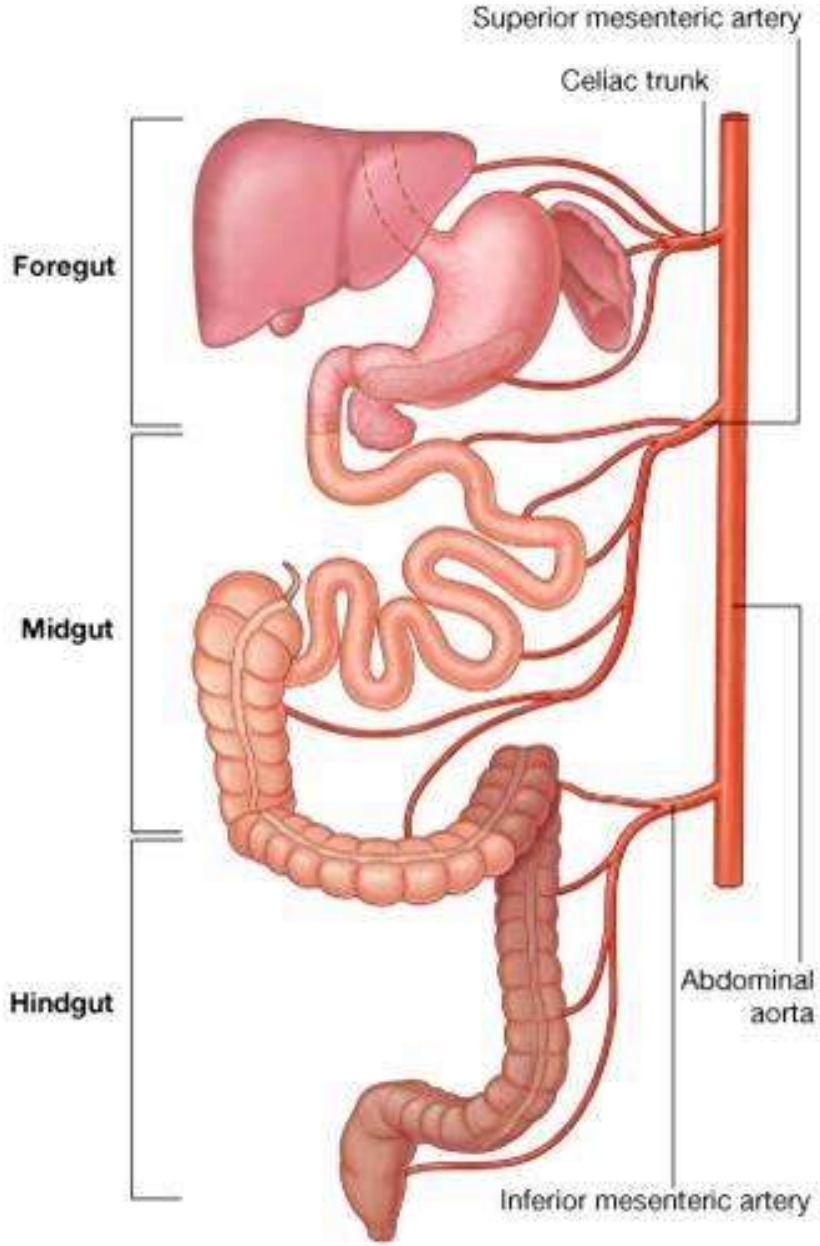


Carcinoid Tumor

Clinical Features
- Peak age 60's
- Symptoms based on hormone produced

When confined to the GI hormones are under the first pass effect and rarely produce symptoms

If symptoms do occur it is strongly associated with **metastasis**



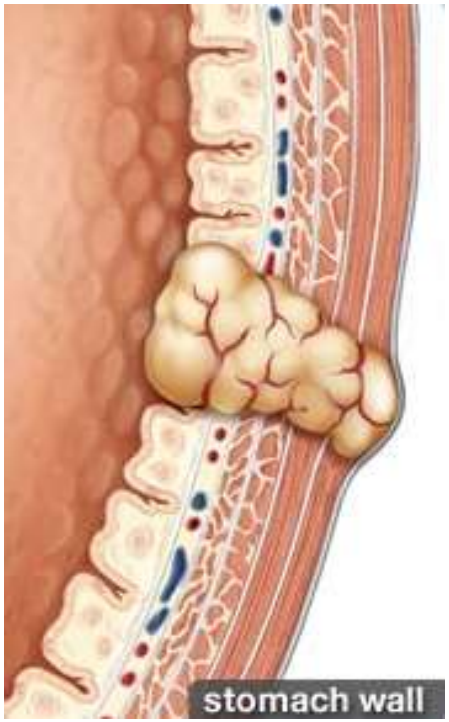
Carcinoid Tumor

Prognosis is strongly based on GI location

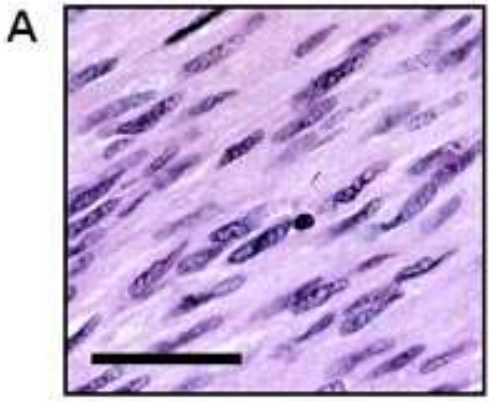
Foregut
- Rare metastasis
- Resection curative

Midgut
- Often multiple/large
- Aggressive/invasive

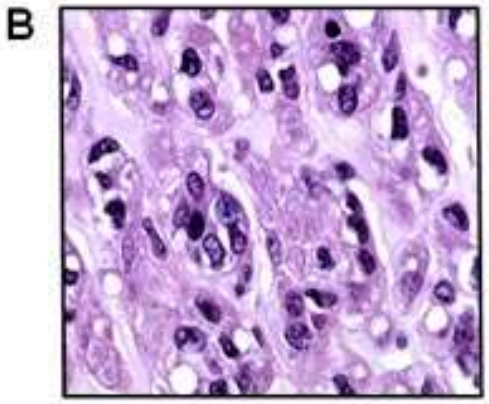
Hindgut
- Uniformly benign in the appendix
- Rectal symptomatic (hormones), occasional metastasis



solitary, well circumscribed, fleshy, submucosal mass



Spindle



Epitheloid

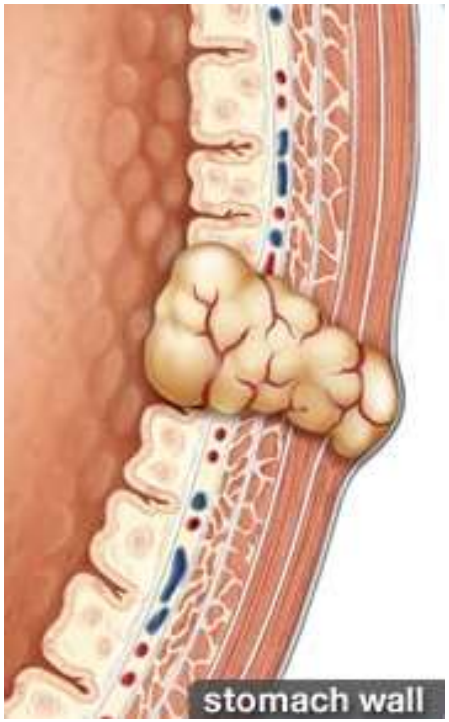
GIST

Most common mesenchymal tumor of the abdomen (stomach)

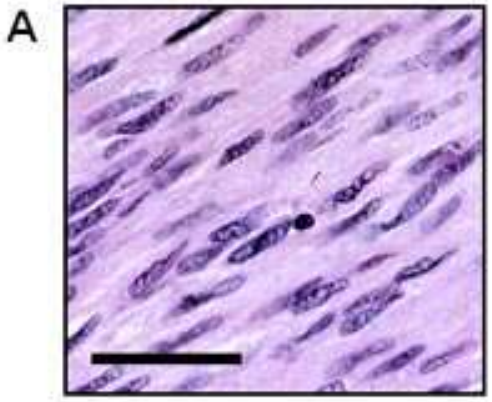
Peak 60's ♂

Activating tyrosine kinase mutations (**c-KIT**, PDGFRA)

Liver metastasis



solitary, well circumscribed, fleshy, submucosal mass



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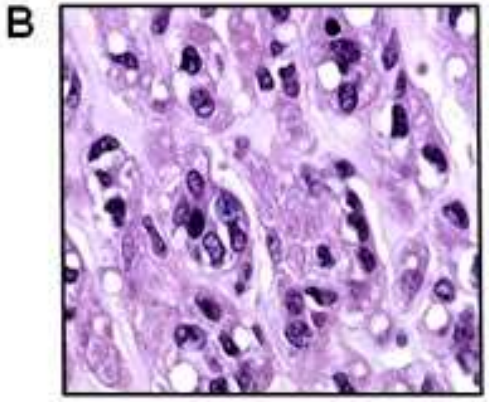


Epitheloid

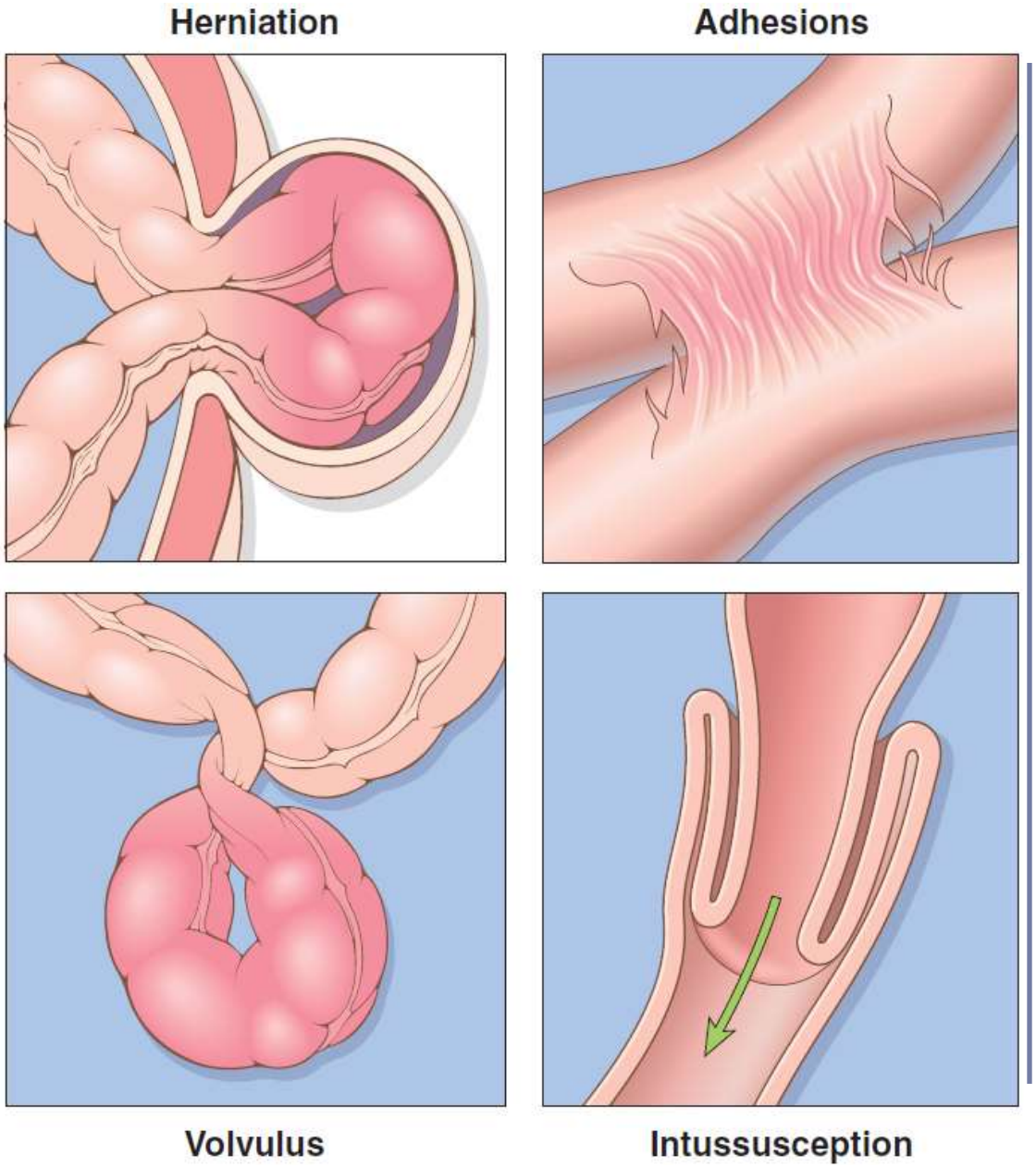
GIST

Presents with mass effects or mucosal ulceration

Prognosis
- Size <5, >10cm
- Mitotic index
- Location

Tx
- Surgical resection
- Imatinib

Small & Large Intestines



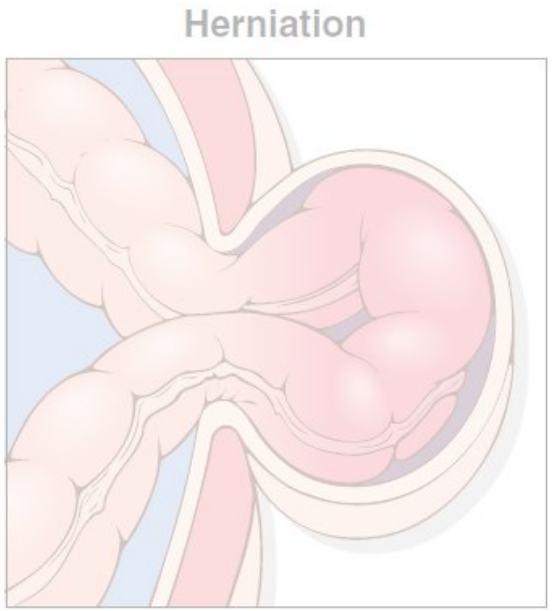
Intestinal Obstruction

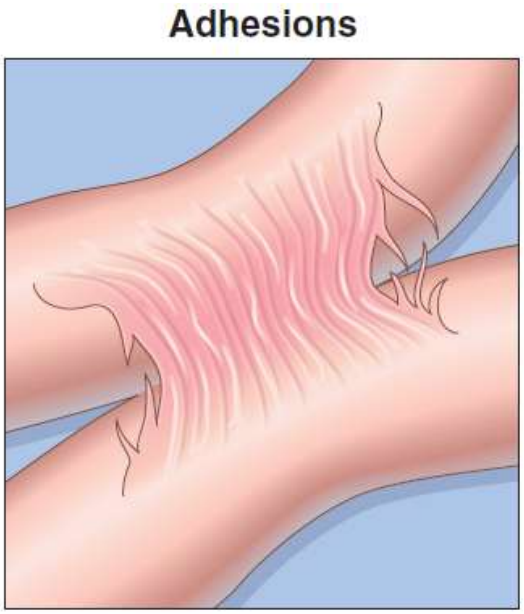
small intestine:
- relatively narrow lumen
- most often involved

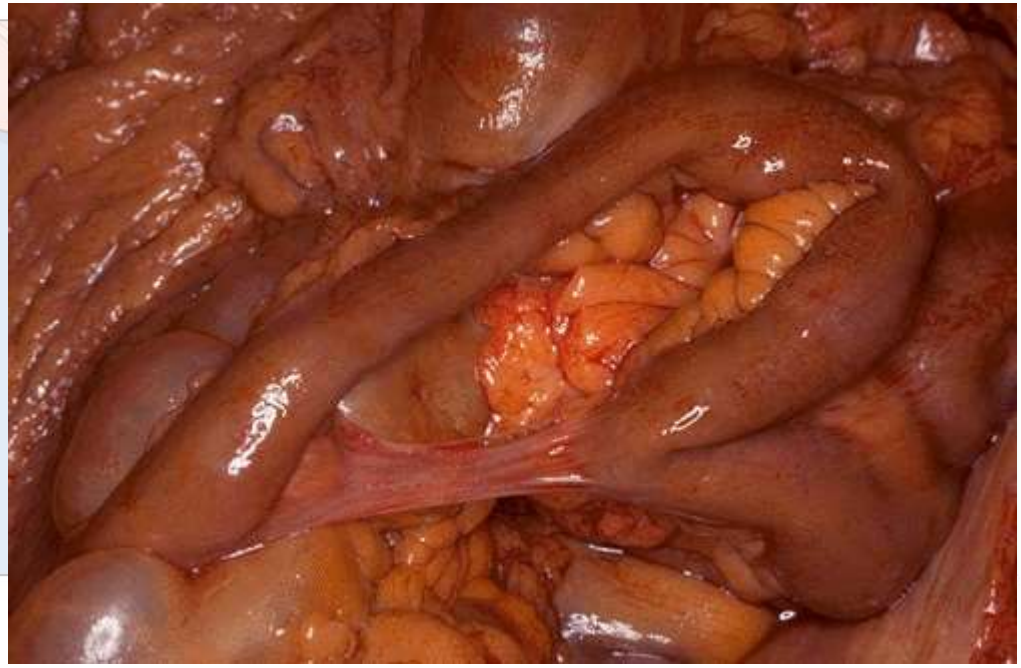
80%

Remaining:
- Tumors
- Infarction (Ischemia-reperfusion)

Pain
Distention
Vomiting
Constipation







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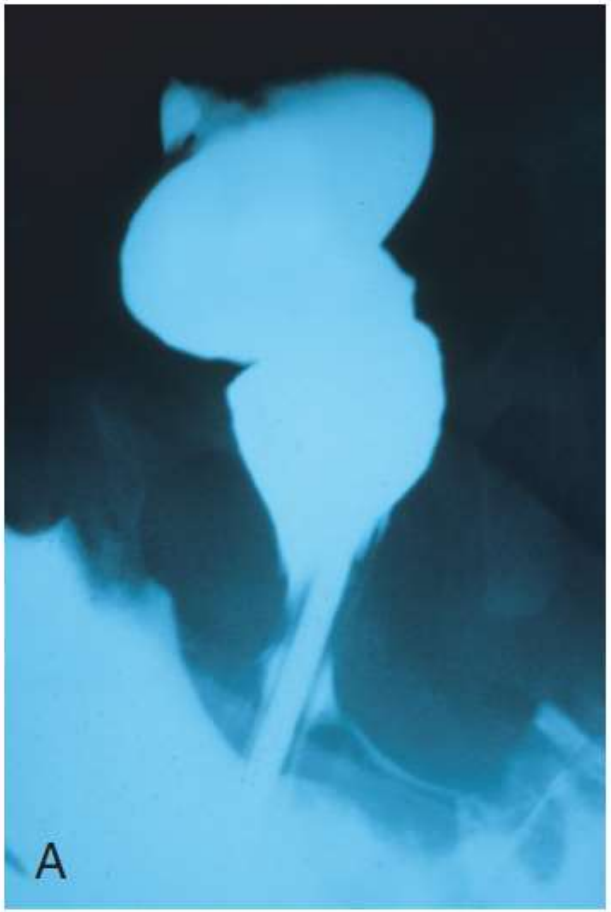
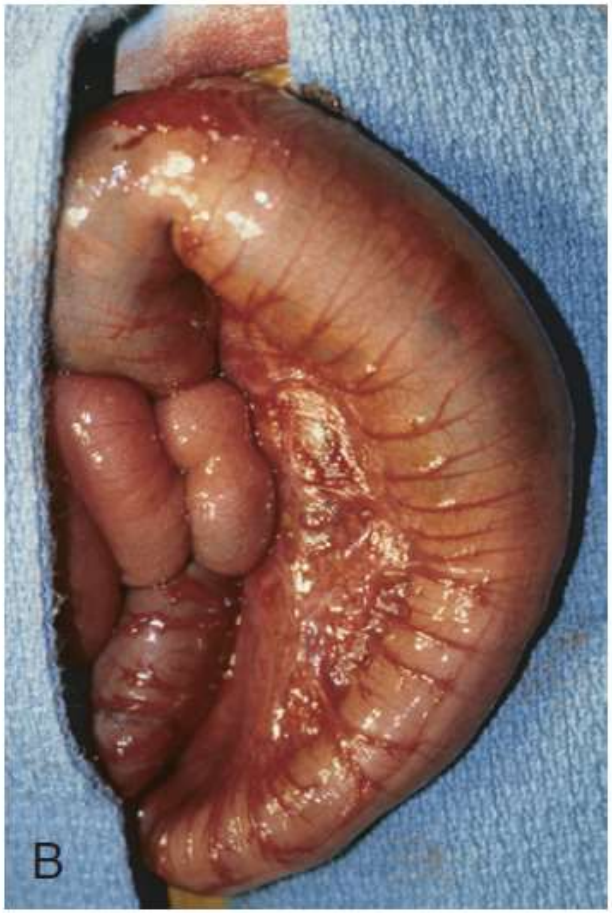
Intestinal Obstruction





<u>Hirschsprung Disease</u>:

Congenital defect in colonic innervation

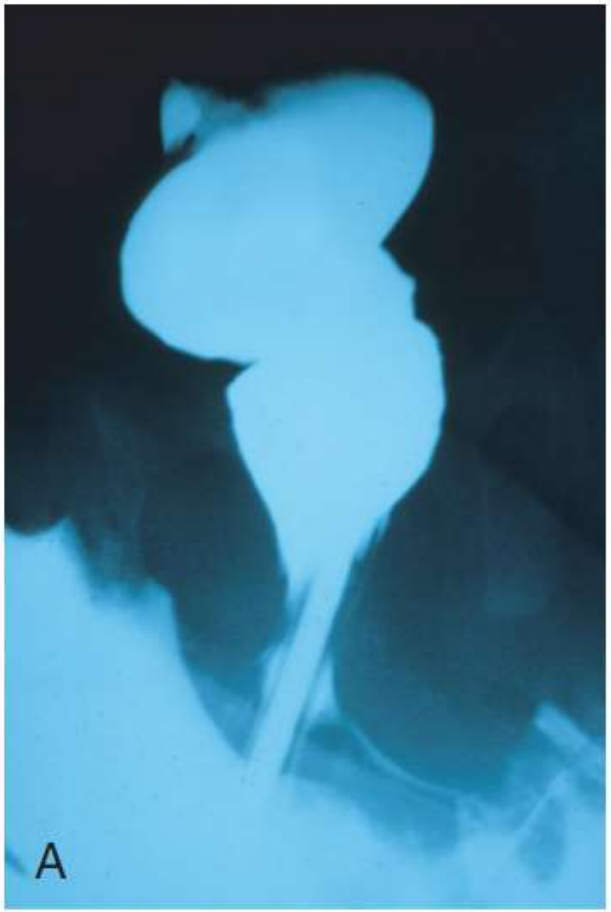
Isolated or in combination

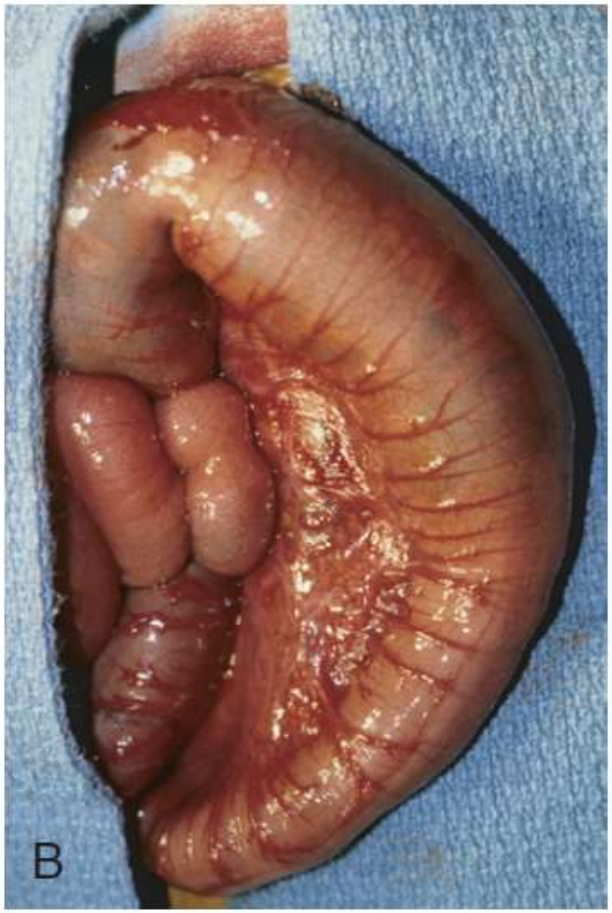
More common in ♂

More severe in ♀

Presentation
- Failure to pass meconium
- Obstructive constipation

Intestinal Obstruction





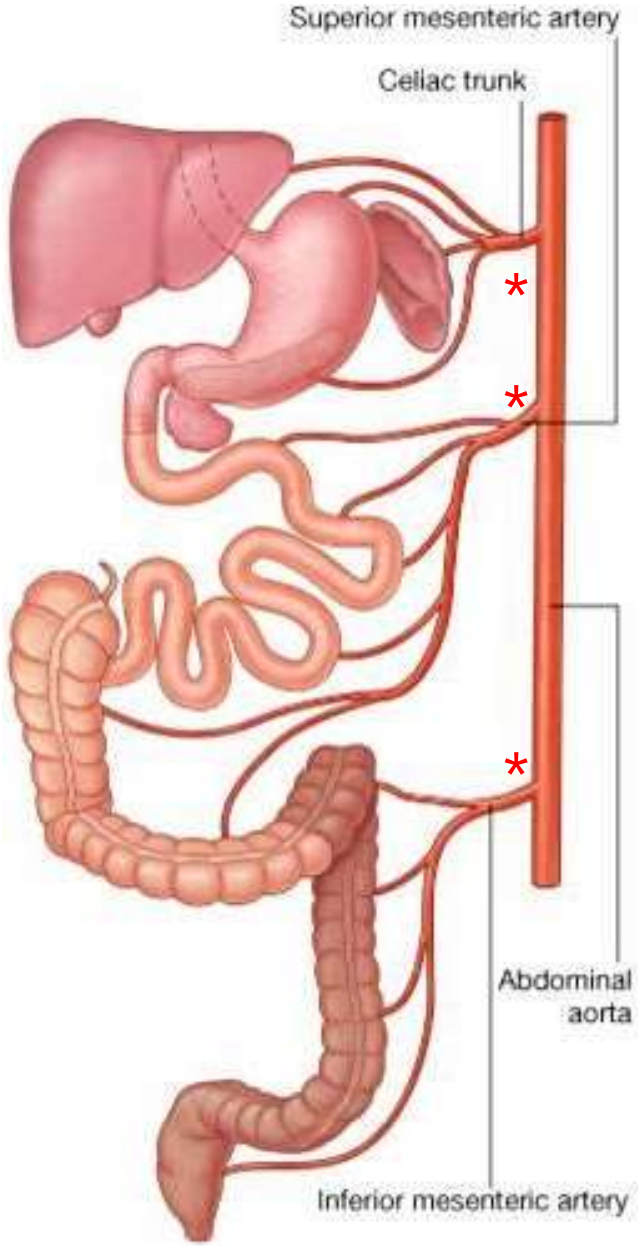
Hirschsprung Disease:

Meissner submucosal plexus and the Auerbach myenteric plexus absent in rectum (always) or more

Aganglionic region normal or contracted with proximal dilation

Tx: Surgical resection

Remember watershed zones

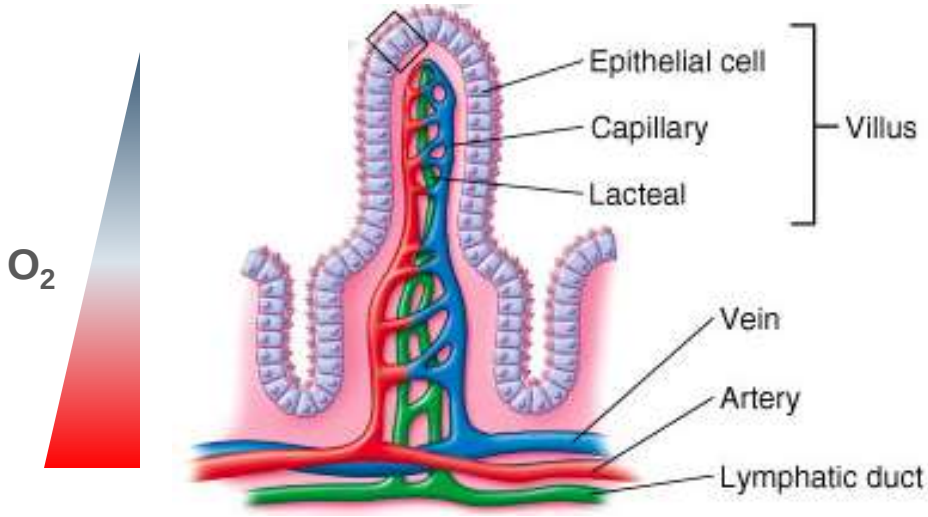


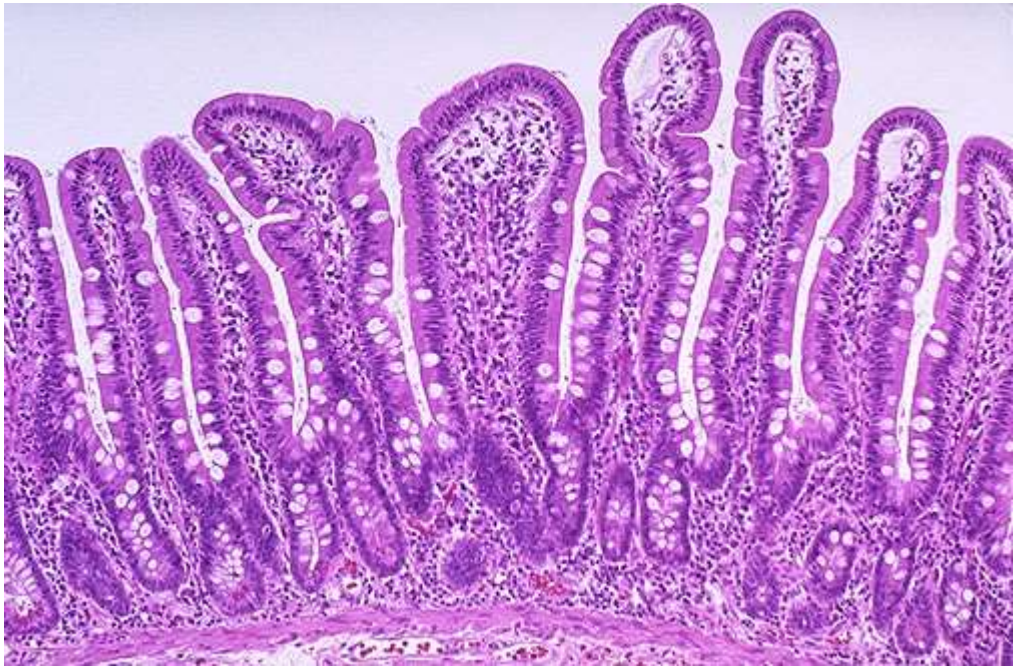
Ischemic Bowel Disease

Interconnections & collaterals make the bowel more resistant to ischemia*

Infarction
Transmural>Mural>Mucosal

Hypoperfusion vs acute vascular obstruction





Ischemic Bowel Disease

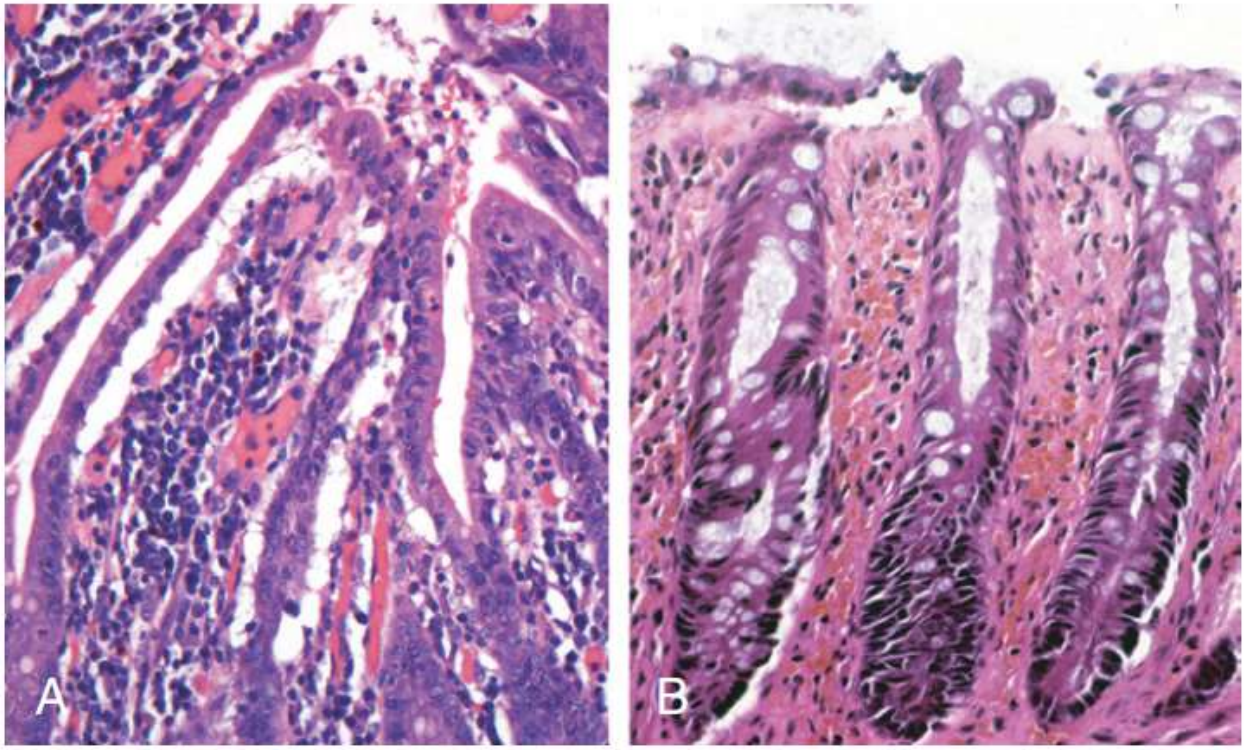
Crypts protected (stem cell compartment)

Surface epithelium more susceptible to injury

Two injury phases (Ischemia-reperfusion)

Outcome mostly depends on severity of compromise, duration and which vessel

Ischemic Bowel Disease



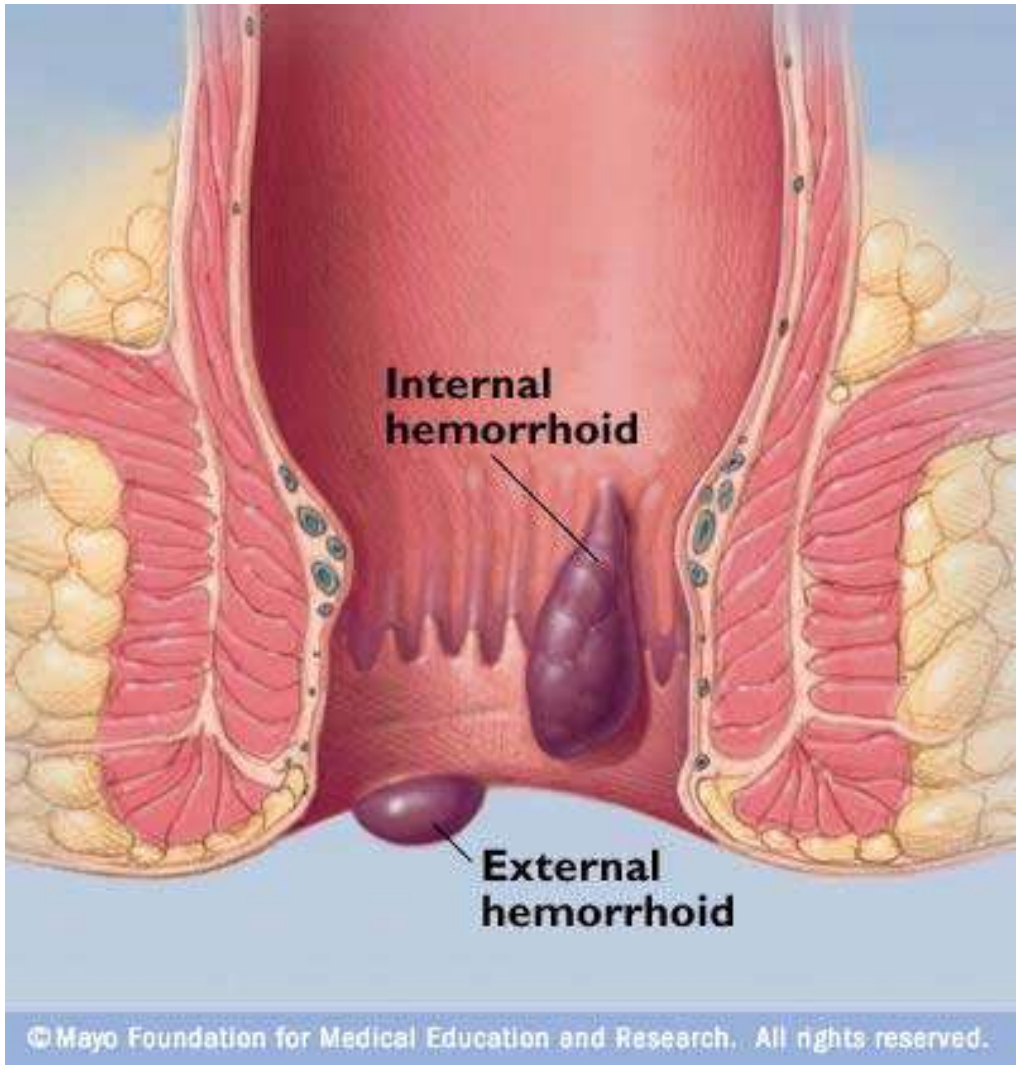
Morphology

Atrophy or sloughing of surface epithelium (A)

Fibrous scarring with chronic ischemia (B)

Clinical Features
- Older, co-existing CVD
- Severe pain/Guarding
- N/V, bloody diarrhea
- Reduced peristalsis
- Blood loss → Shock
- Sepsis

DDx AA, AC, PU



Hemorrhoids

Dilated anal and perianal collateral vessels

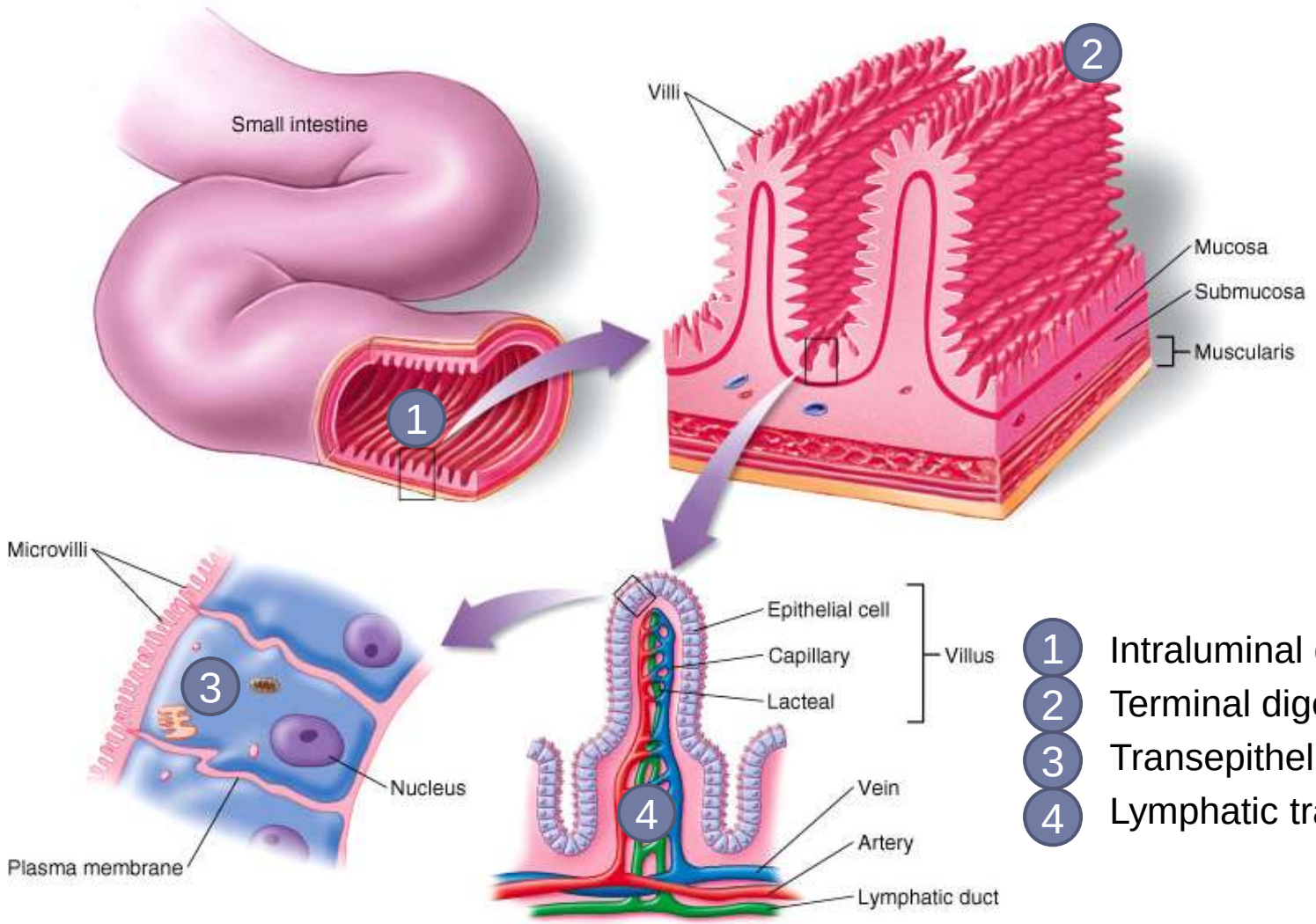
Increased intra-abdominal and venous pressure

- Constipation/straining
- Pregnancy
- Portal hypertension

Clinical Features
- Pain
- Bleeding (bright red)

Tx: sclerotherpy, banding, IR coagulation, surgery

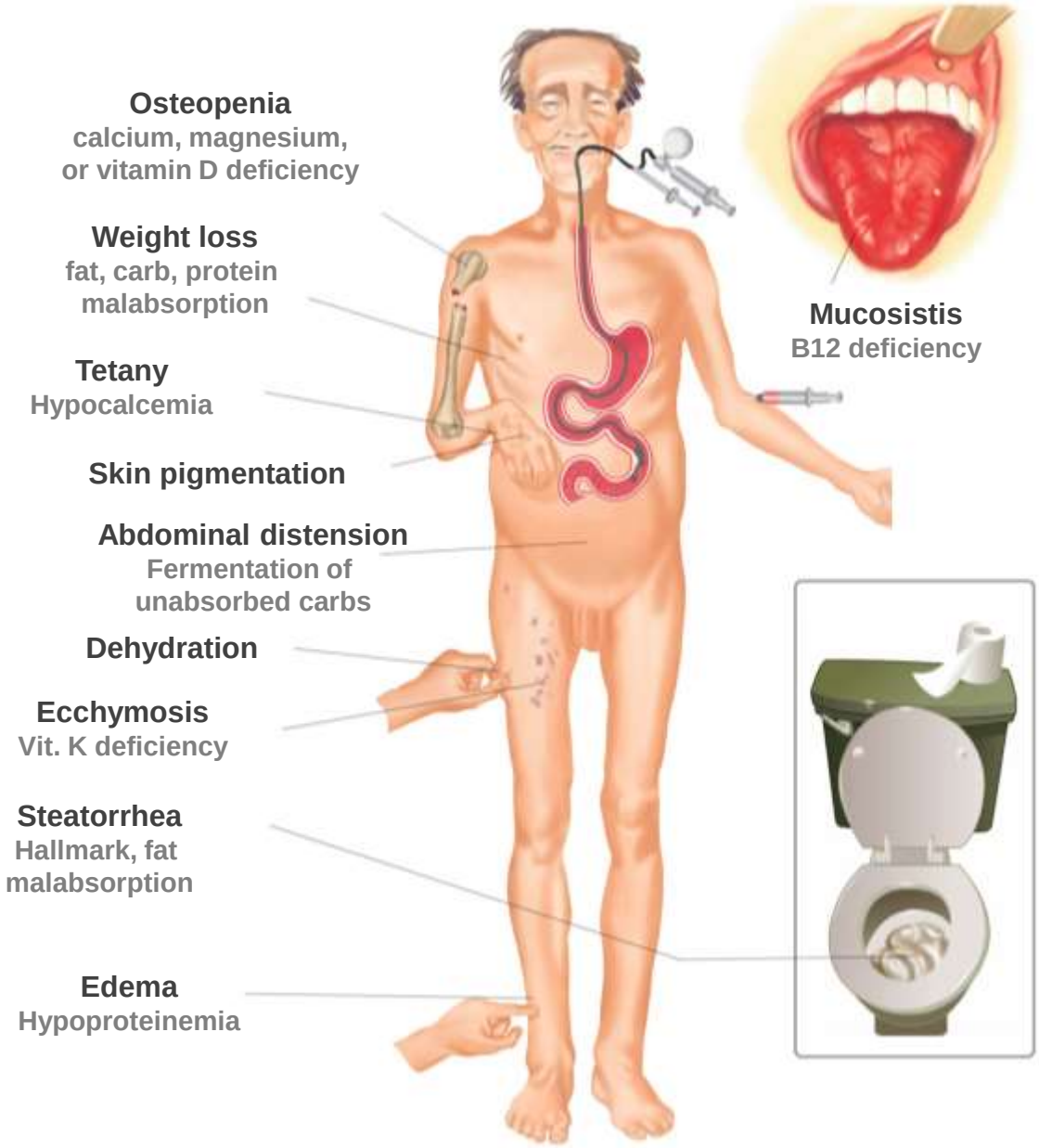
Digestion



1. Intraluminal digestion
2. Terminal digestion
3. Transepithelial transport
4. Lymphatic transport

Malabsorption

Disease	1 Intraluminal Digestion	2 Terminal Digestion	3 Transepithelial Transport	4 Lymphatic Transport
Celiac disease		+	+	
Tropical sprue		+	+	
Chronic pancreatitis	+			
Cystic fibrosis	+			
Primary bile acid malabsorption	+		+	
Carcinoid syndrome			+	
Autoimmune enteropathy		+	+	
Disaccharidase deficiency		+		
Whipple disease				+
Abetalipoproteinemia			+	
Viral gastroenteritis		+	+	
Bacterial gastroenteritis		+	+	
Parasitic gastroenteritis		+	+	
Inflammatory bowel disease	+	+	+	



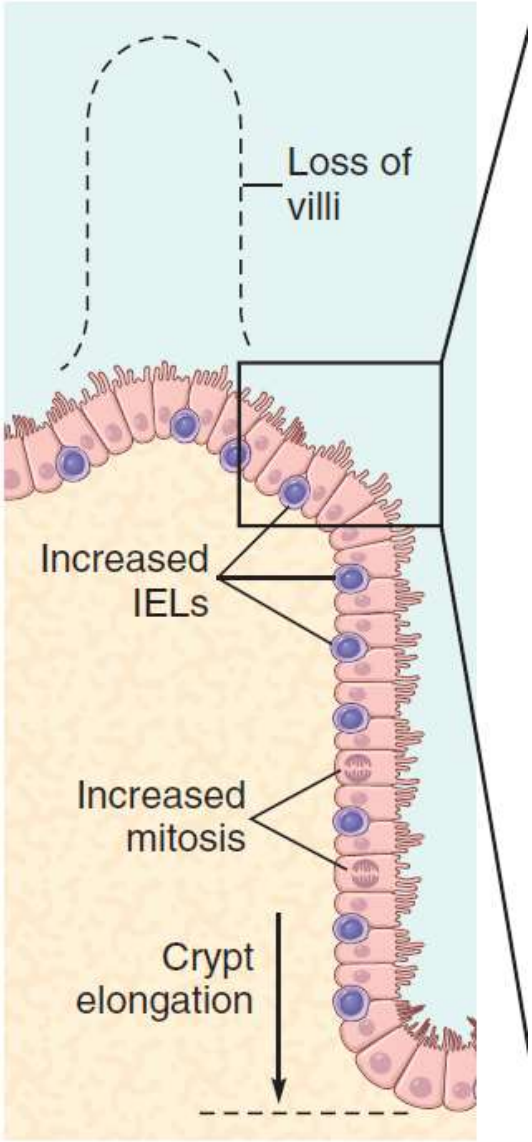
Malabsorption Syndromes

Resemble each other more than they differ

- Diarrhea
- Flatus
- Abdominal pain
- Weight loss

Consequences

- Anemia	pyridoxine,
- Mucositis	folate, vit B_{12}
- Bleeding	Vit. K
- Osteopenia	Ca, Mg,
- Tetany	Vit. D
- Neuropathy	Vit. A or B_{12}



Celiac Disease

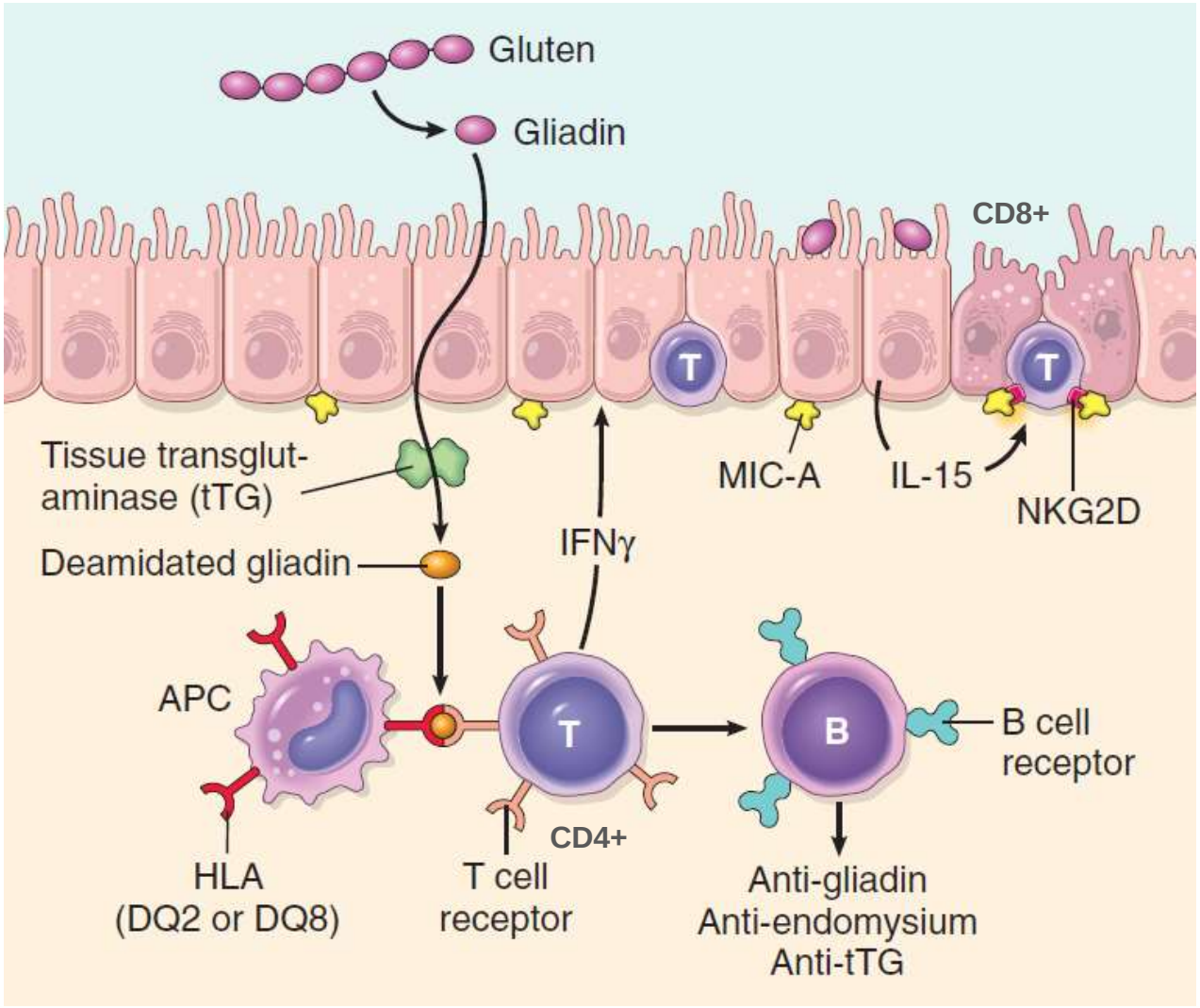
Gluten-sensitive enteropathy (2 age groups)

Immune mediated reaction to Gliadin resulting in:

- Villous atrophy
- ↑ Intraepithelial lymphocytes (IELs)
- Epithelial proliferation
- Crypt elongation

↓area → malabsorption
Anemia (Iron, B_{12}, Folate)

Tx: Gluten free diet



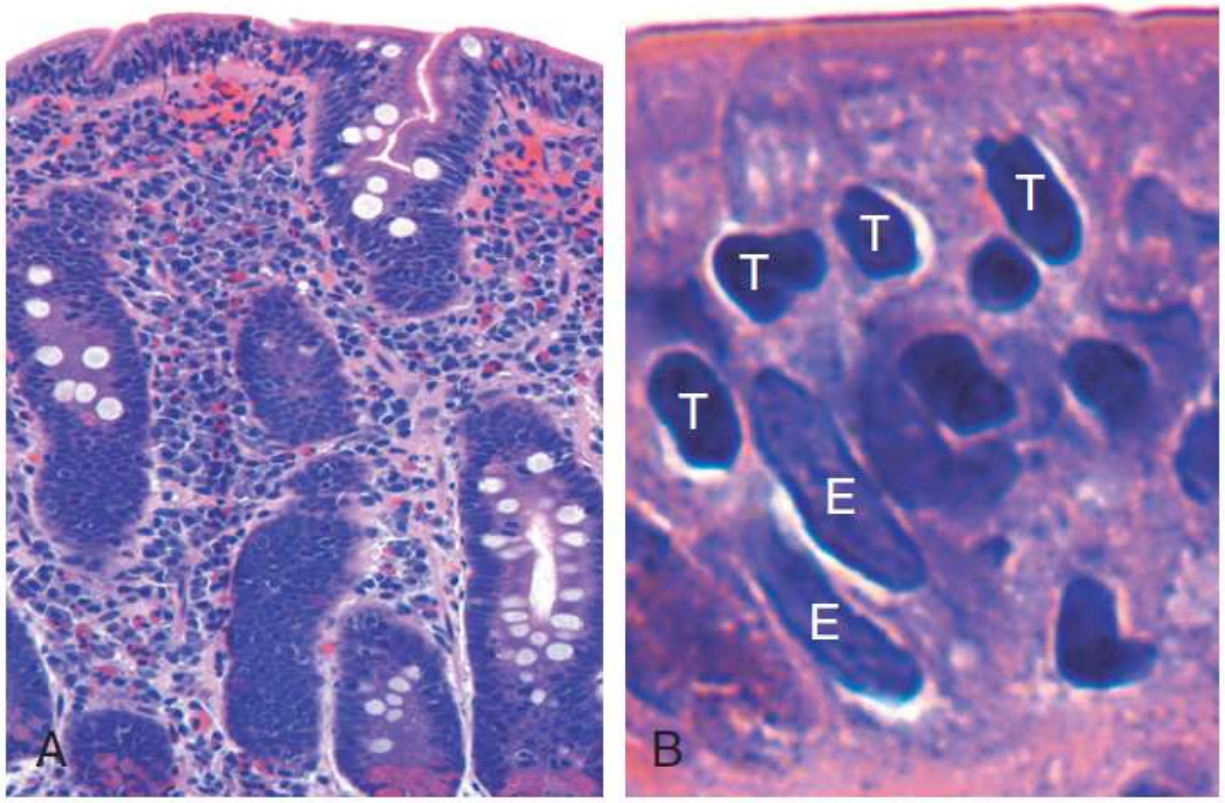
Celiac Disease

APC-CD4+ activation, cytokine production

B-cell response (Ab):
- anti-tissue transglutaminase
- anti-deamidated gliadin
- anti-endomysial (Dx)

IL-15 induced CD8+ response

Epithelial damage, more Gliadin crosses, more damage.



Celiac Disease

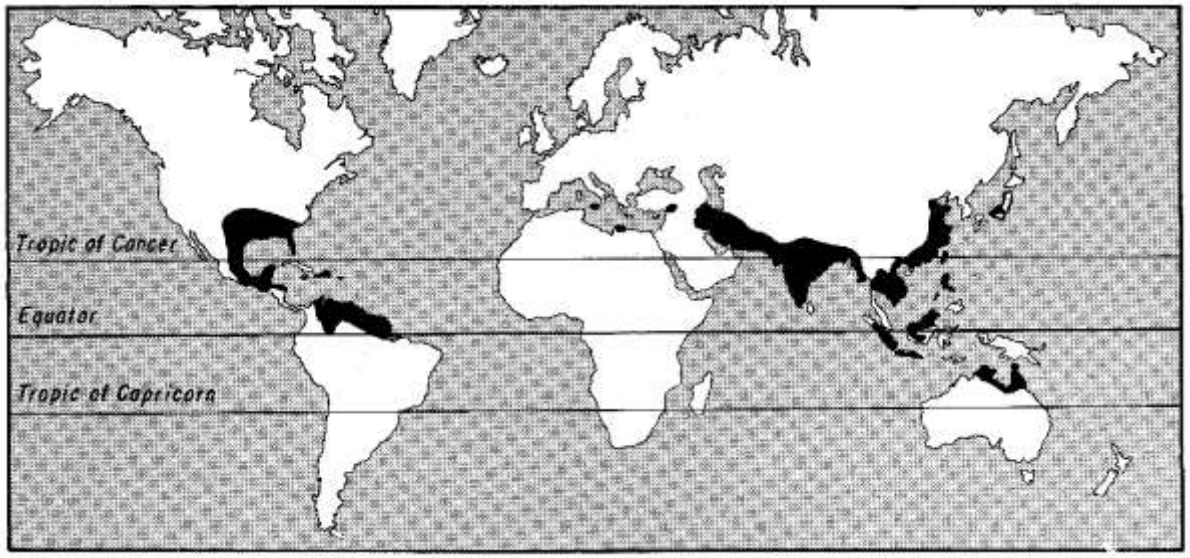
Villous atrophy & crypt hyperplasia (A)

↑ Intraepithelial lymphocytes (IELs) (A,B)

Non-specific changes, combined with serology becomes specific

Silent: Serology + villous atrophy, no symptoms

Latent: Serology only



Environmental Enteropathy

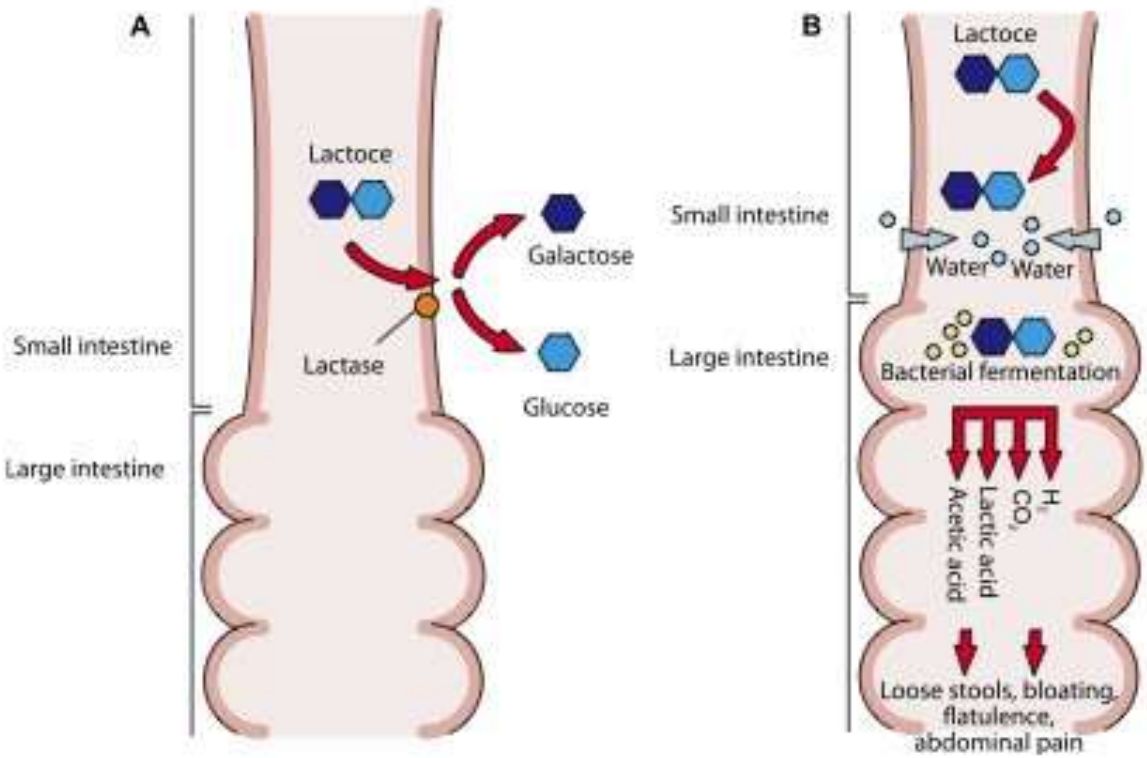
Previously known as tropical sprue

150 million children worldwide (stunted growth)

Malnutrition?
Infection?

Repeated diarrhea during the first 2-3yrs of life

Similar histology to celiac disease



Lactase Deficiency

Biochemical defect with Unremarkable biopsy

Congenital (AR) rare

Acquired downregulation after childhood or after enteric viral/bacterial infections