

Large Intestine

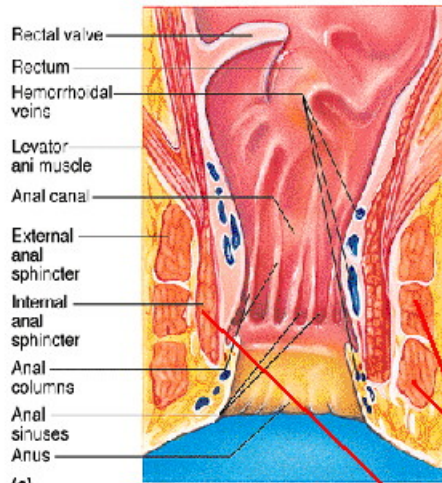
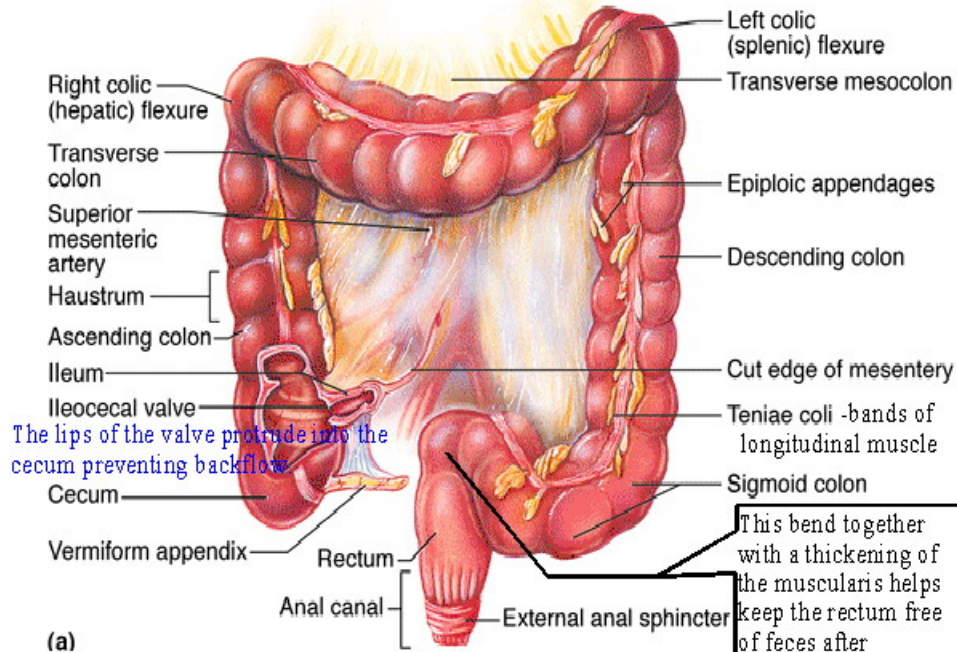
Function

- complete absorption
- manufacture of certain vitamins
- formation of feces
- expulsion of feces from the body

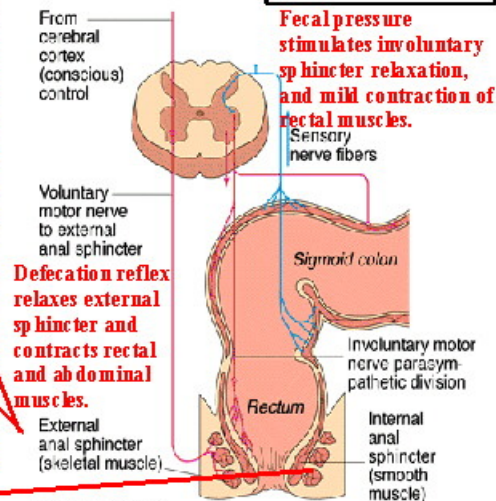
Gross Anatomy

- 2.5 inches in diameter and about 5 feet long.
- Extends from the ileum to the anus
- attached to the posterior abdominal by its mesocolon
- Divided into four principal regions: cecum, colon, rectum, and anal canal.

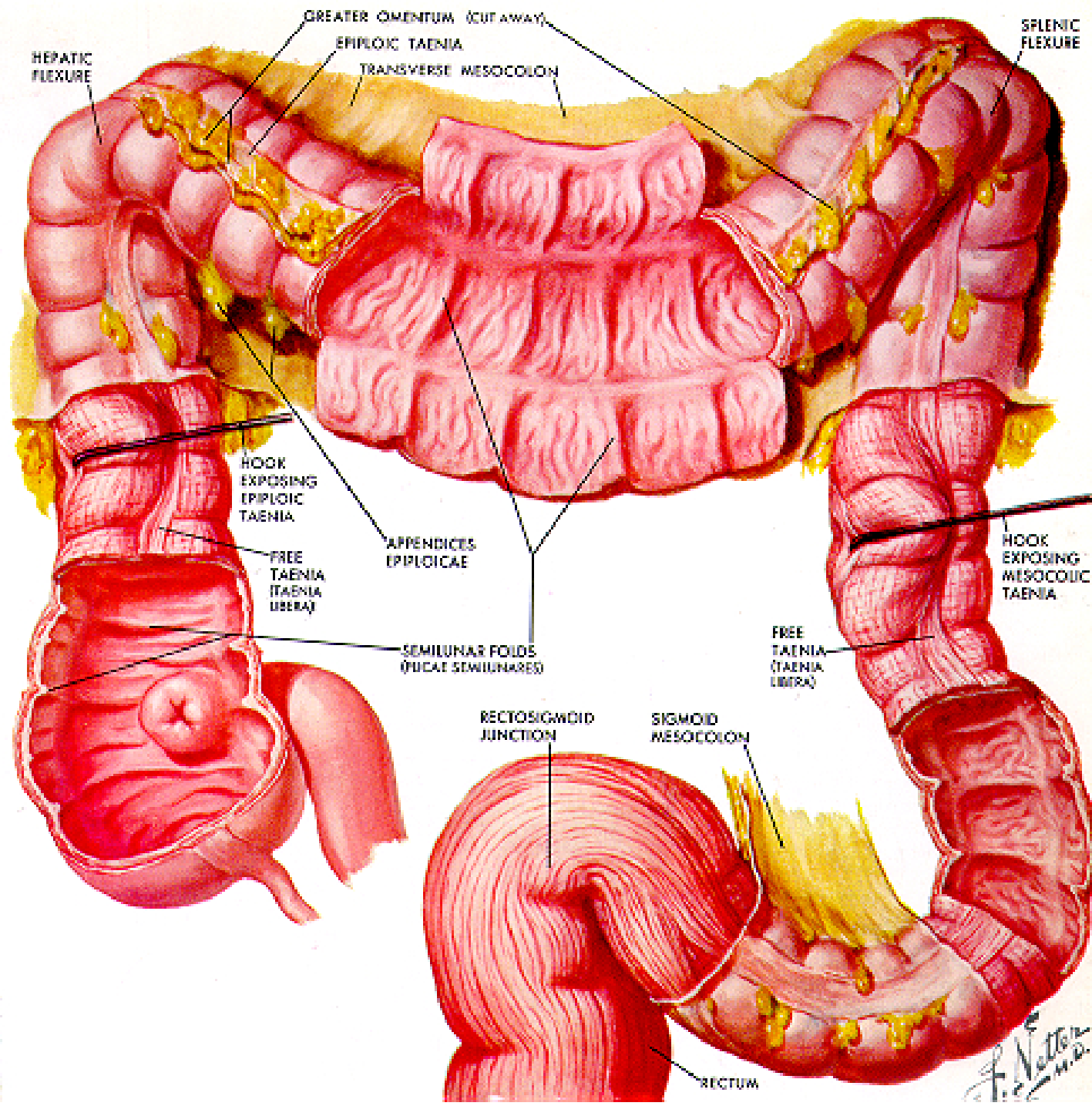
The Colon



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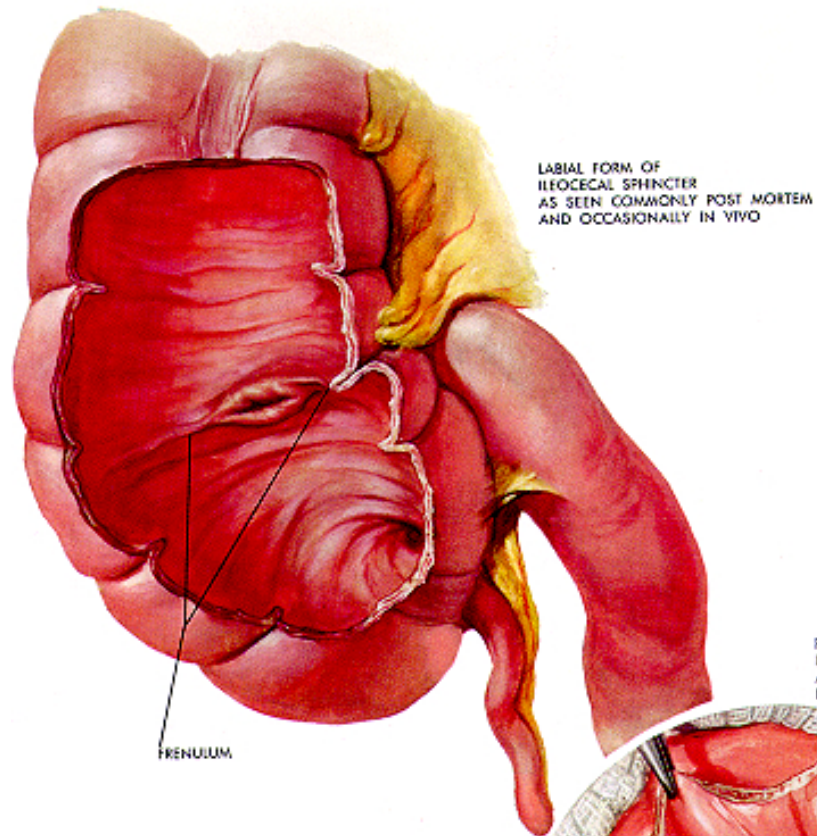


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- Taneniae coli-**
longitudinal bands
whose contractions
cause the
appearance of
haustra (pouche)
- Ileocecal valve
 - appendix
 - ascending colon
 - transvers colon
 - descending colon
 - sigmoid colon
 - rectum
 - anal canal- terminal
2-3cm of the rectum

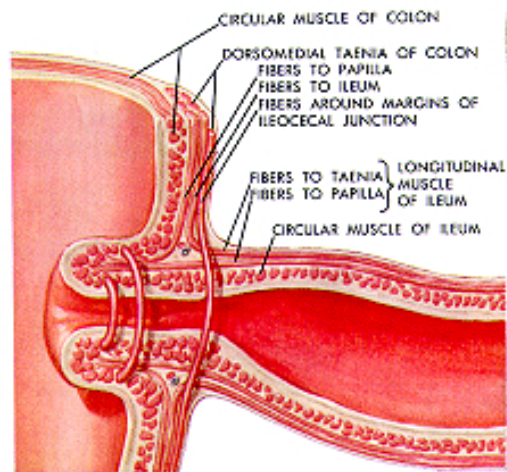
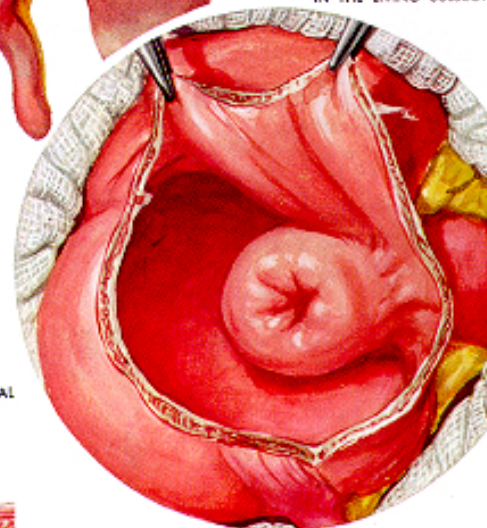
F. Netter M.D.



LABIAL FORM OF ILEOCECAL SPHINCTER AS SEEN COMMONLY POST MORTEM AND OCCASIONALLY IN VIVO

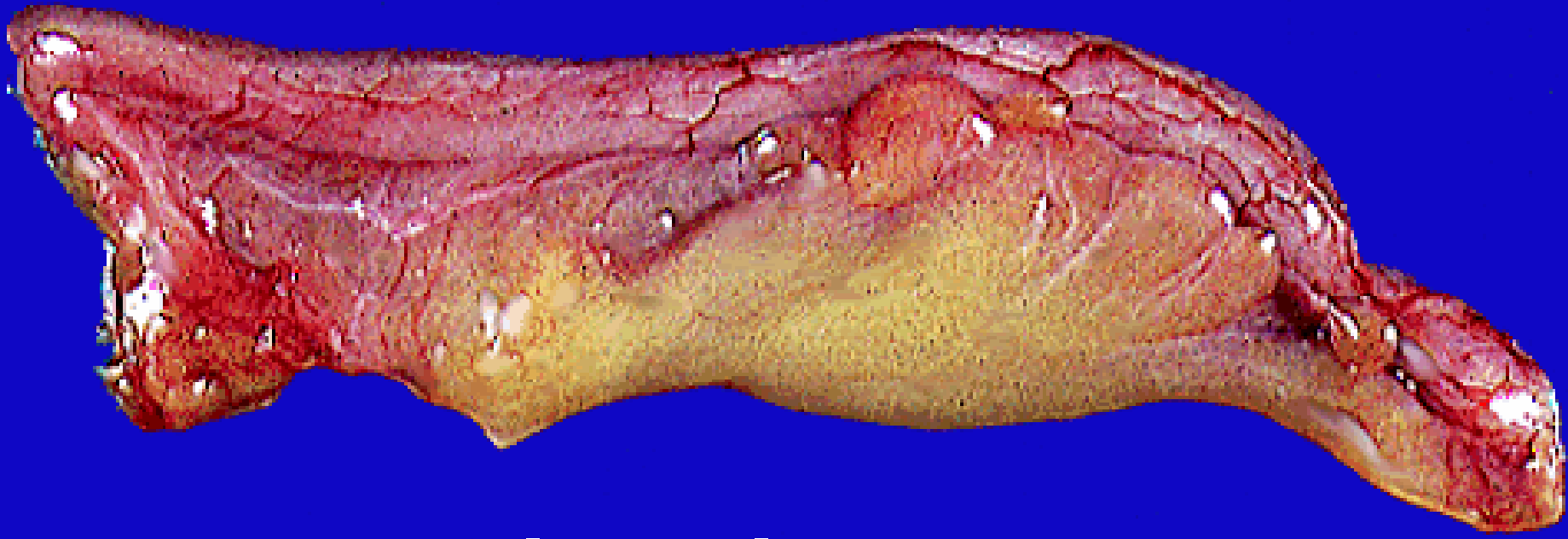
FRENUM

PAPILLARY FORM OF ILEOCECAL SPHINCTER AS FOUND MOST COMMON IN THE LIVING SUBJECT



SCHEMA OF MUSCULATURE AT ILEOCECAL SPHINCTER (AFTER DI DI)

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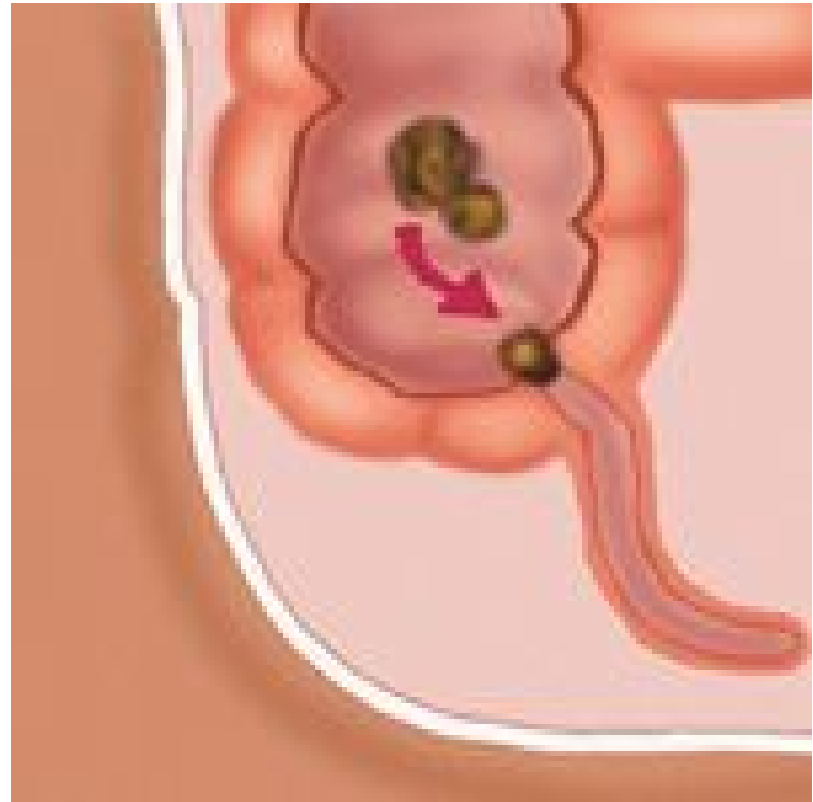
Appendicitis

- Acute appendicitis is an inflammation of the appendix.
- It is one of the most common surgical emergencies seen.
- It can occur at any age but is most common between the ages of 10 and 30 years old.

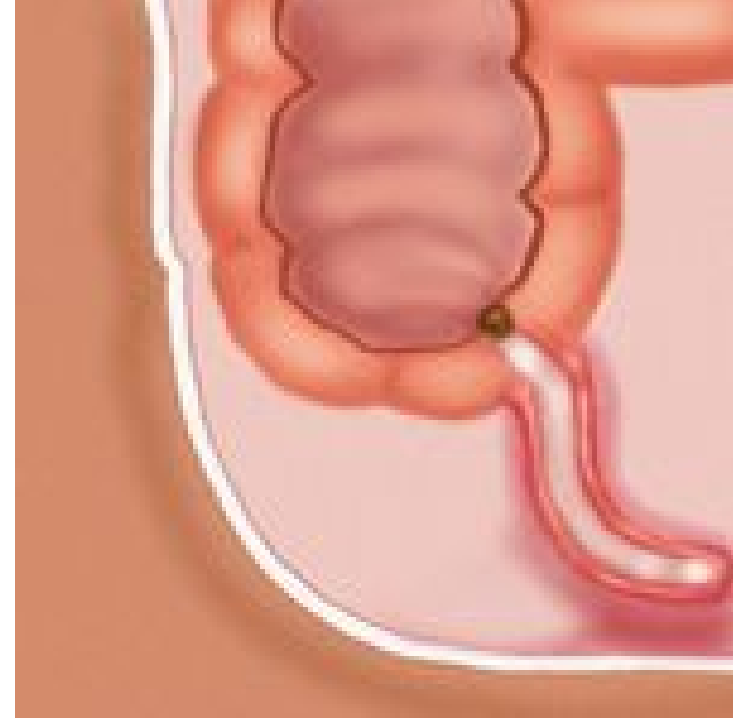
Symptoms of Acute Appendicitis

- Classically, the pain begins as a cramp in the central abdomen and
- over time, moves to the right side.
- Fever, chills, shivering, loss of appetite, vomiting and sometimes diarrhea may follow.

- caused by an obstruction of the lumen (cavity) of the appendix.
- The commonest cause is a faecolith (a small piece of stool).
- On rare occasions, it can be caused by a tumour or swelling of the lymphoid tissue.



- When obstructed, the pressure inside the appendix rises and cuts off blood supply. This leads to ulceration, bacterial infection and ultimately, gangrene and perforation of the appendix



- Acute appendicitis may result in rupture of the appendix with subsequent abscess formation in the abdominal cavity or peritonitis (infection of the abdominal cavity).



Histology of the Large Intestine

- No villi or permanent circular folds are found in the mucosa.
- the epithelium contains mostly absorptive cells (absorb mostly water) and numerous goblet cells (secrete mucus to lubricate colonic contents).
- the epithelial cells form long intestinal glands.
- Also find solitary lymph nodules in the mucosa

Differences Between the Large and Small Intestine

- No villi or permanent circular folds are found in the mucoa.
- The epithelium contains mostly absorptive and numerous goblet cells.
- Taneniae run the entire length of the colon
- The presence of haustra

Digestion in the Large Intestine

Mechanical

- Haustral churning- the contracting and squeezing of the intestinal contents.
- Peristalsis- slower than other parts of GI tract.
- Mass peristalsis- strong peristaltic wave that drives the colonic contents into the rectum.
 - initiated by food in the stomach

Digestion in the Large Intestine (cont.)

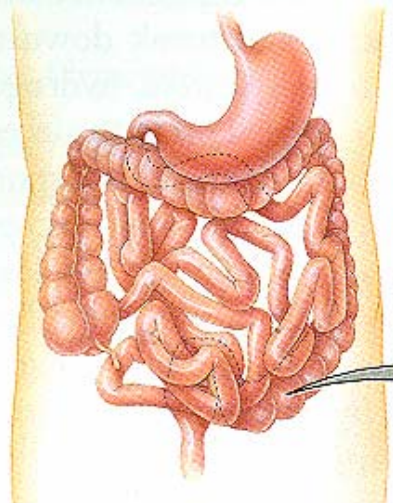
Chemical

- the last stage of digestion occurs through bacterial not enzymatic action.
- Up to 40% of the fecal mass is bacteria
- Bacteria ferments the remaining carbohydrates, releasing hydrogen, CO₂, and methane gas (flatus).
- The remaining protein are converted to amino acids and other products and absorbed.
- Decomposes bilirubin to urobilinogen which gives feces its brown color.
- Some B vitamins and vitamin K are synthesized.
- **Peritonitis**- acute inflammation of the peritoneal cavity

Defecation

Feces consist of inorganic salts, sloughed off epithelial cells, bacteria, products of bacterial decomposition, undigested food, and water.

- Mass peristalsis initiates the defecation reflex.
- impulses from parasympathetic fibers, voluntary contracts of the diaphragm and abdominal muscles, all act to cause contraction of the **internal anal sphincter**.
- The external anal sphincter is voluntarily controlled.
- **Diarrhea**- defecation of liquid feces caused by increased movement of the intestines, decreasing the time for absorption.
- **Constipation**- difficult defecation of dry feces caused by decreased motility.

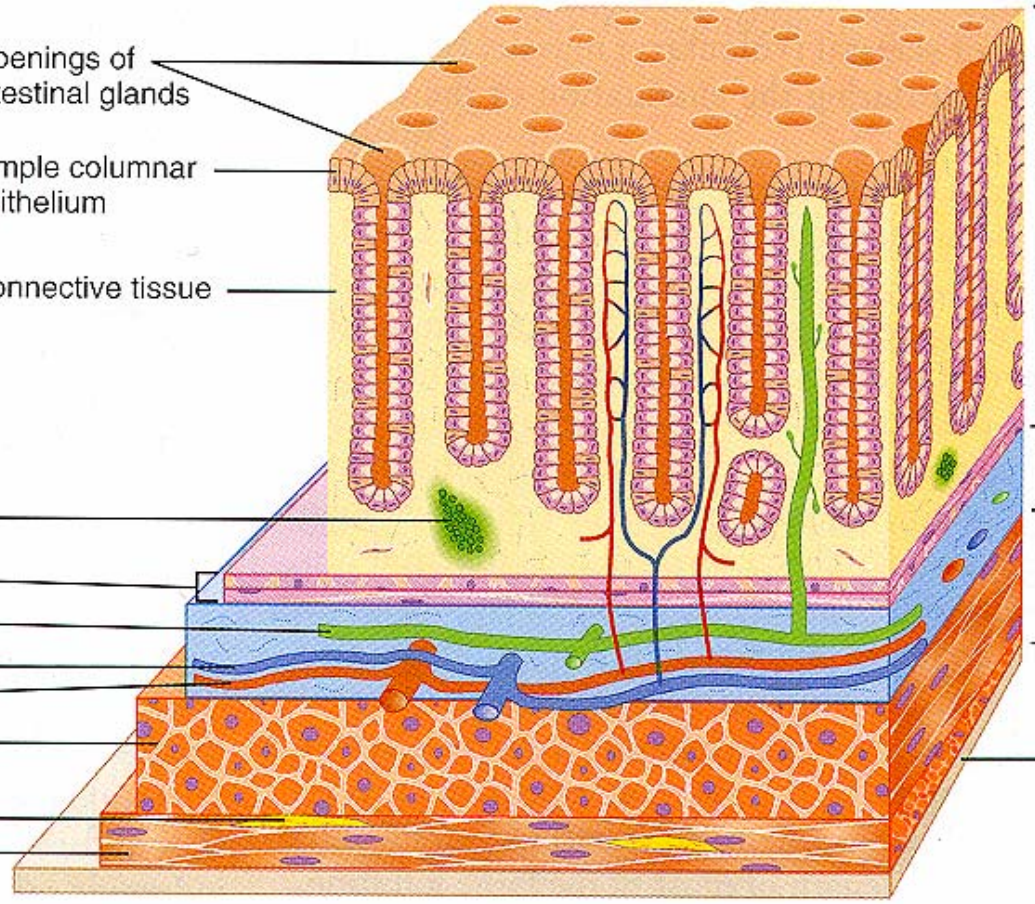


Lumen of large intestine

Openings of intestinal glands
Simple columnar epithelium
Connective tissue

Mucosa
Submucosa
Muscularis
Serosa

Lymphatic nodule
Muscularis mucosae
Lymphatic vessel
Venule
Arteriole
Circular layer of muscle
Nerve supply in muscularis
Longitudinal layer of muscle

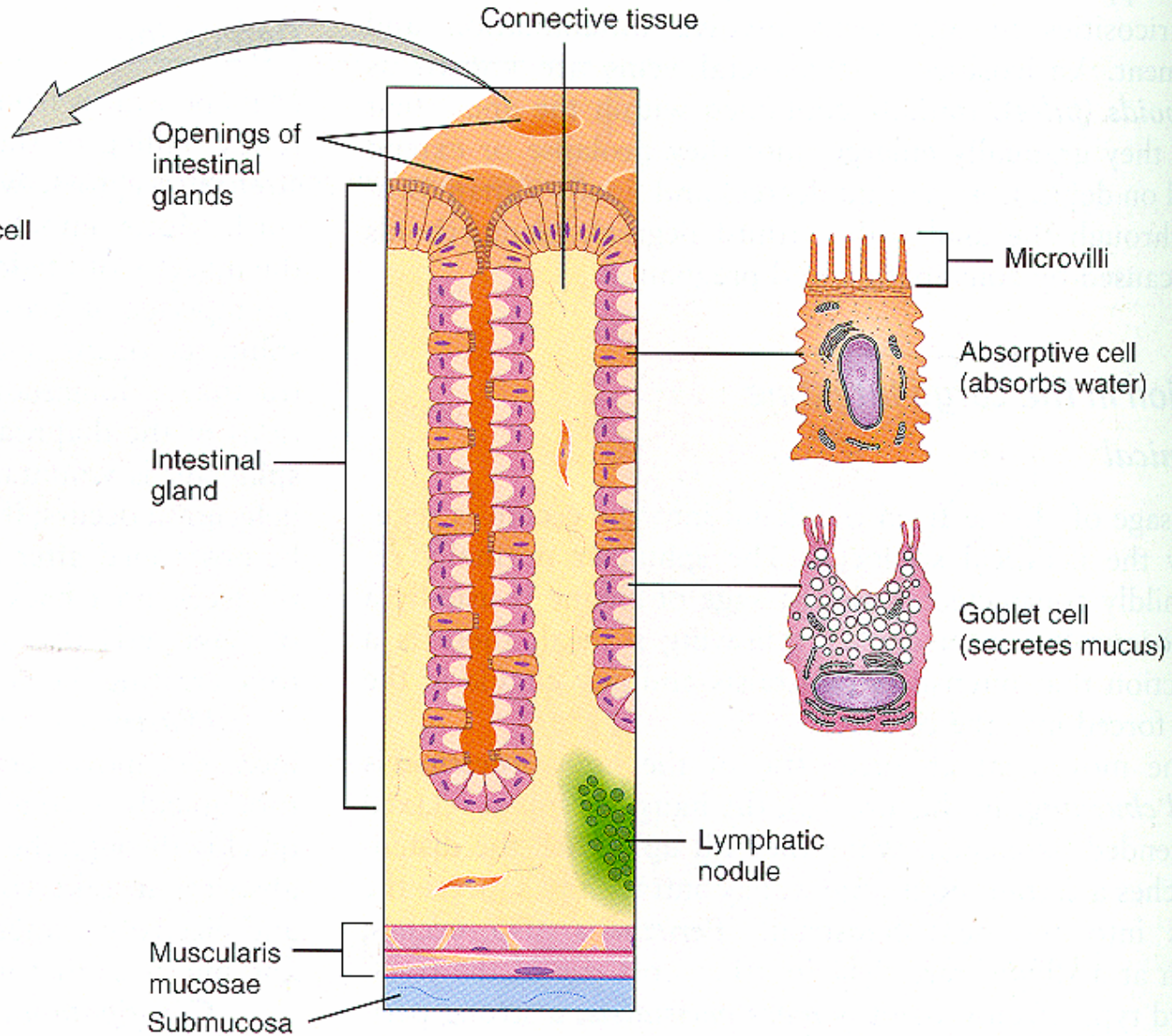




Absorptive cell

Goblet cell

Scanning electron micrograph of large intestinal mucosa (2900x)



Openings of intestinal glands

Connective tissue

Intestinal gland

Muscularis mucosae

Submucosa

Microvilli

Absorptive cell (absorbs water)

Goblet cell (secretes mucus)

Lymphatic nodule

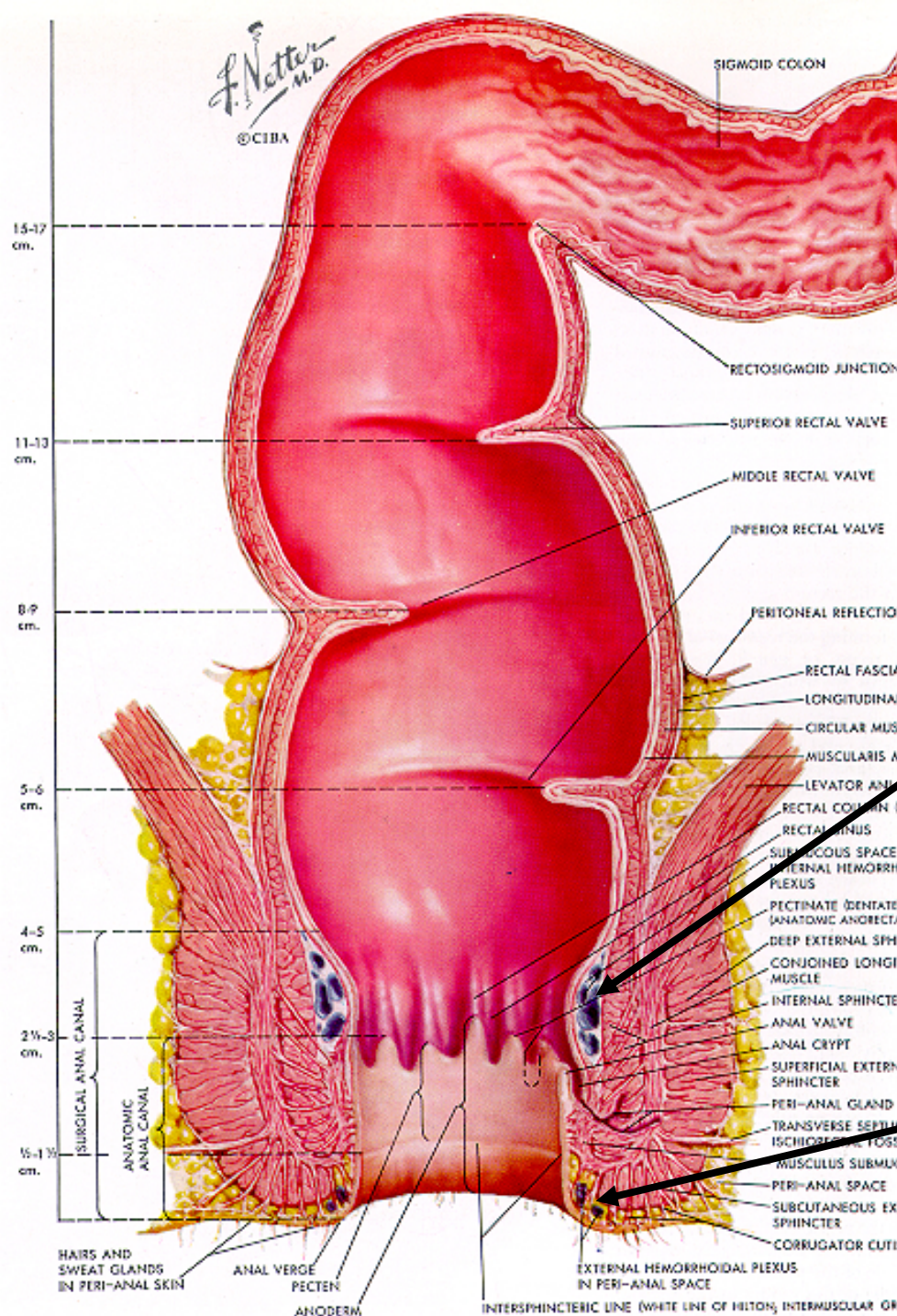
(b) Sectional view of the large intestinal mucosa showing intestinal glands

What are hemorrhoids?

- Hemorrhoids are swollen veins in your rectum or anus. The type of hemorrhoid you have depends on where it occurs.
- **Internal hemorrhoids** involve the veins inside your rectum.
 - usually don't hurt but they may bleed painlessly.
- **Prolapsed hemorrhoid-** internal hemorrhoid that stretch down until it bulges outside your anus
 - prolapsed hemorrhoid will go back inside your rectum on its own, or you can gently push it back inside
- **External hemorrhoids** involve the veins outside the anus. They can be itchy or painful and can sometimes crack and bleed.
 - usually develop over time and may result from straining with stools, childbirth, lengthy car trips or prolonged sitting, constipation or diarrhea.
- If a blood clot forms, you may feel a tender lump on the edge of your anus. You may see bright red blood on the toilet paper or in the toilet after a bowel movement.
 - usually present with pain on standing, sitting or defecating.

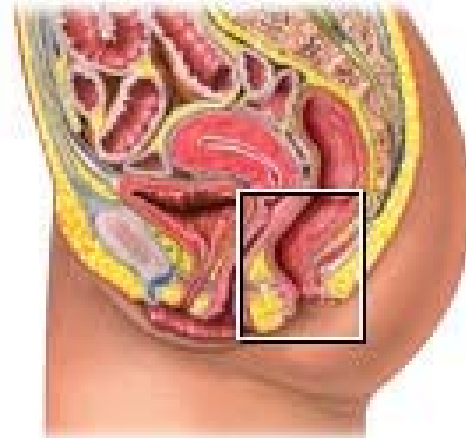
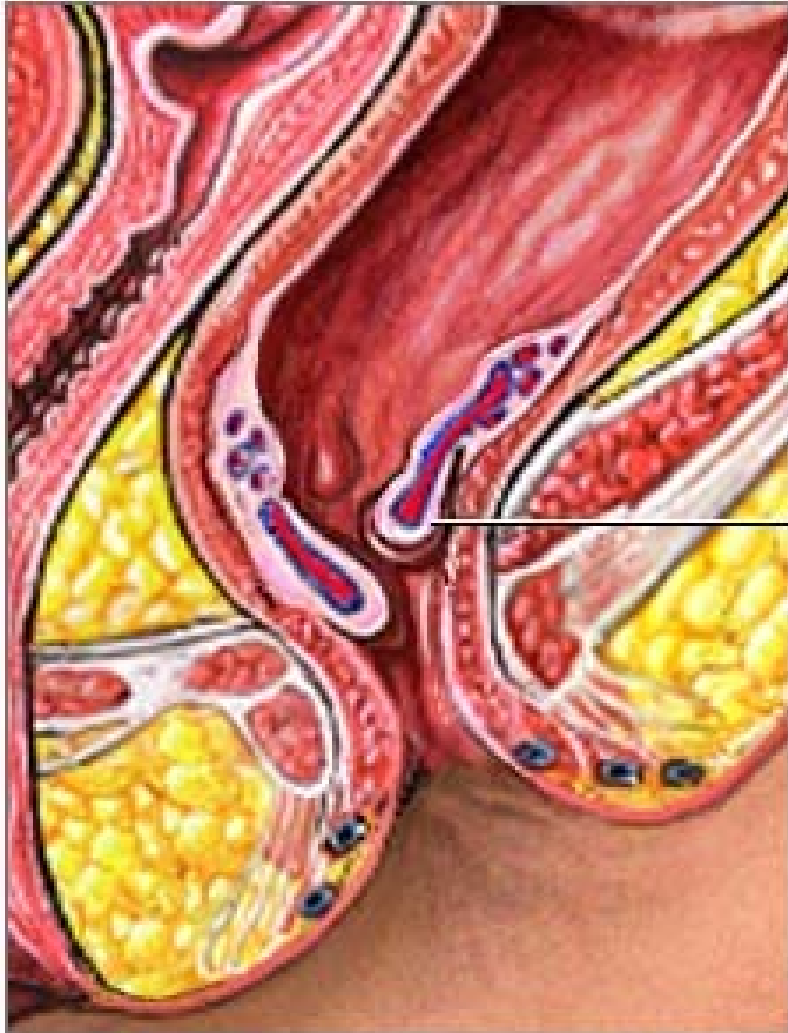
What can I do about hemorrhoids?

- Include more fiber in your diet. Fresh fruits, leafy vegetables, and whole-grain breads and cereals are good sources of fiber.
- Drink plenty of fluids (except alcohol). Eight glasses of water a day is ideal.
- Exercise regularly.
- Avoid laxatives except bulk-forming laxatives such as Fiberall, Metamucil, etc. Other types of laxatives can lead to diarrhea, which can worsen hemorrhoids.
- When you feel the need to have a bowel movement, don't wait too long to use the bathroom.



Internal hemorrhoidal plexus

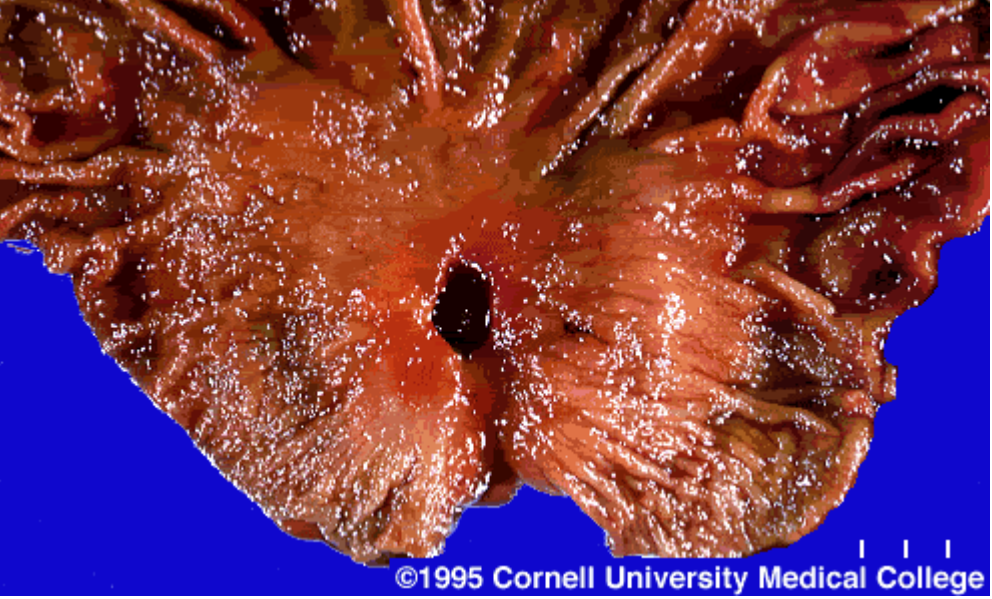
External hemorrhoidal plexus



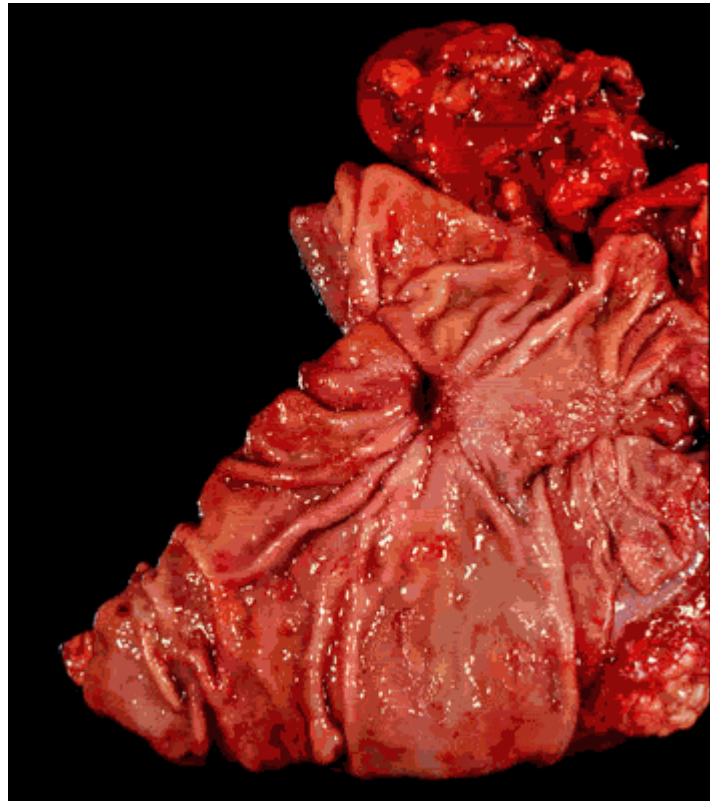
Inflamed
hemorrhoids

Hemorrhoids are
enlarged veins
located within
tissues of the
lower portion of
the rectum or anus

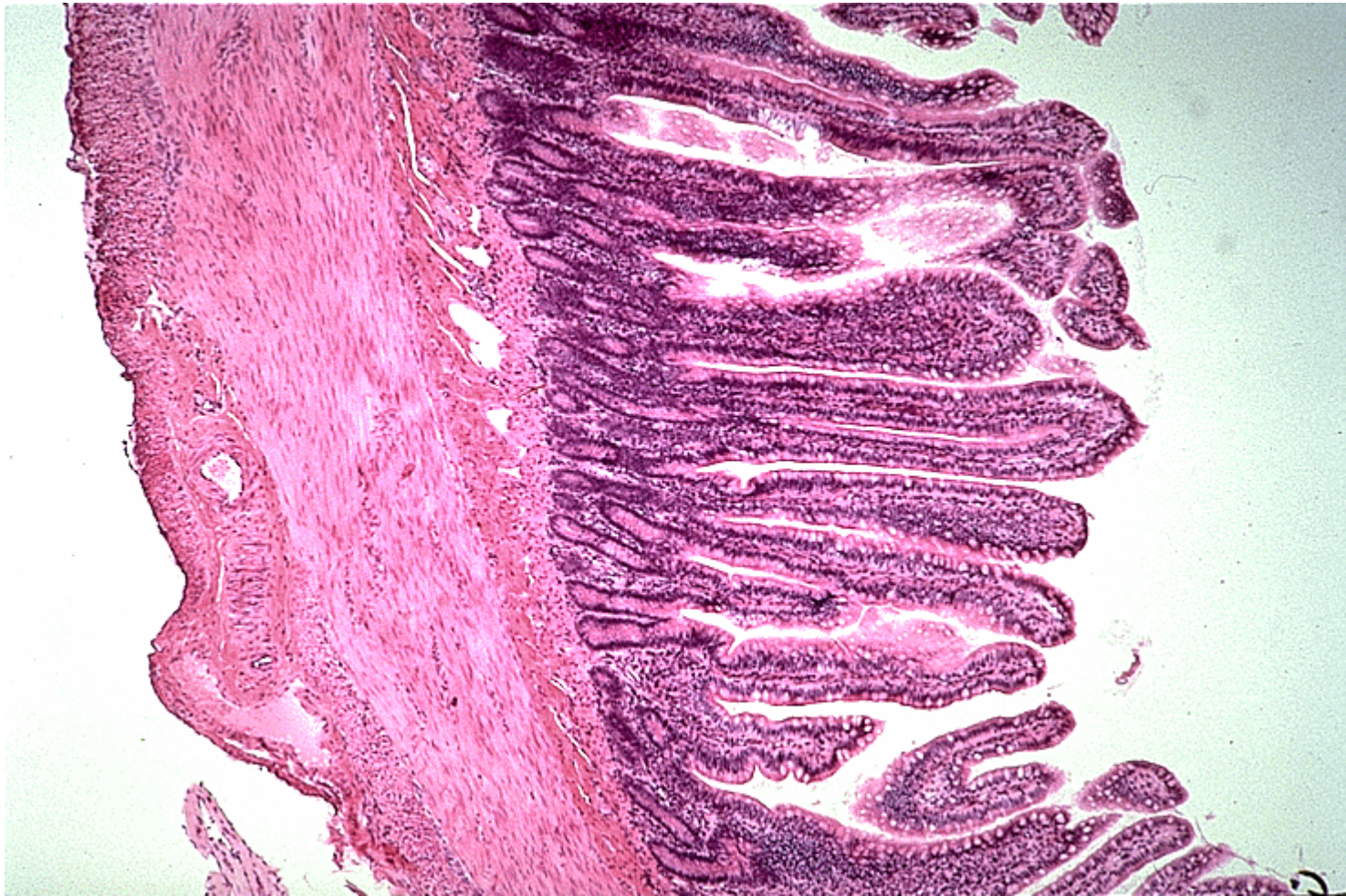




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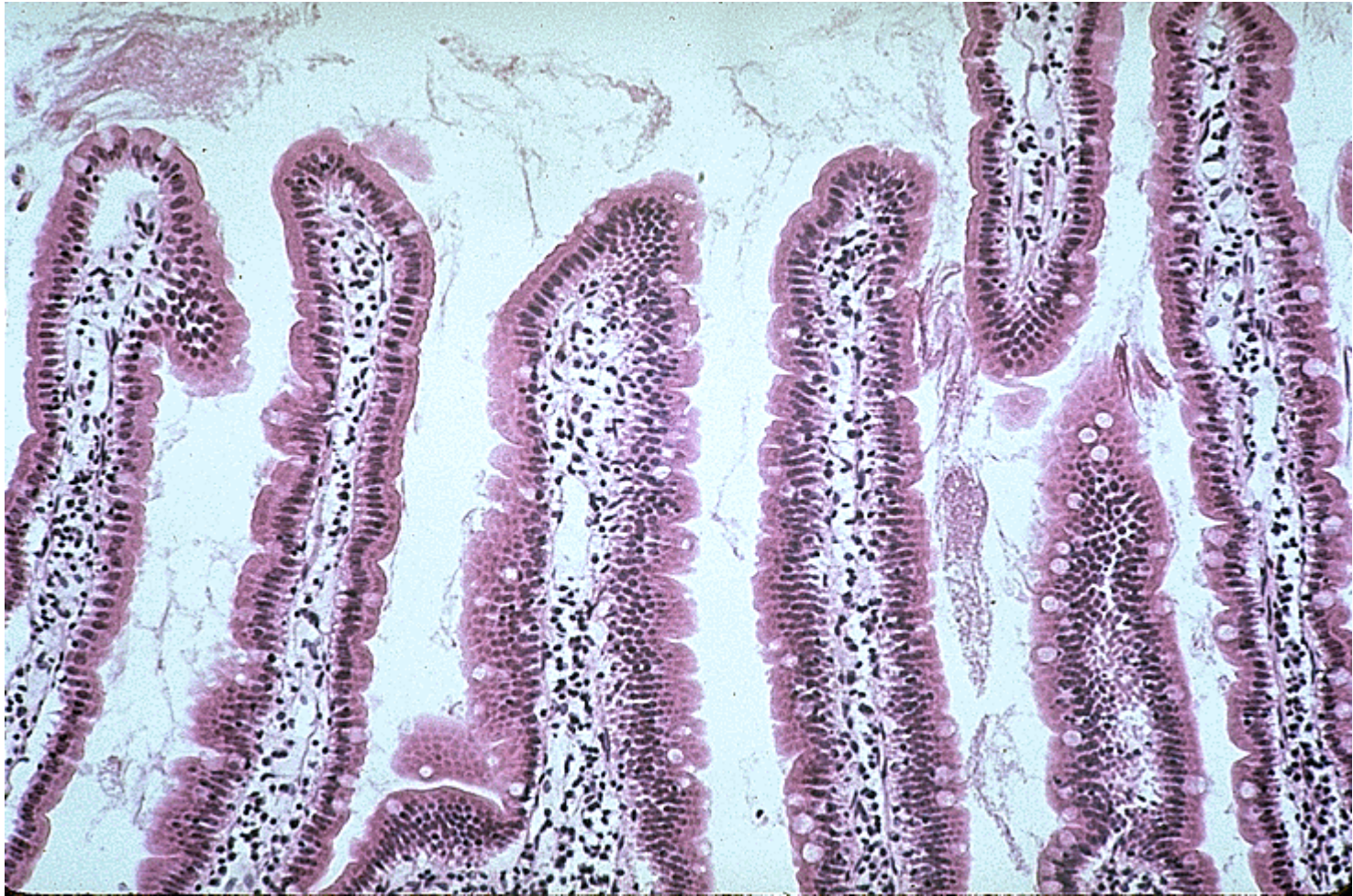
Jejunum, Mucosa and Muscularis



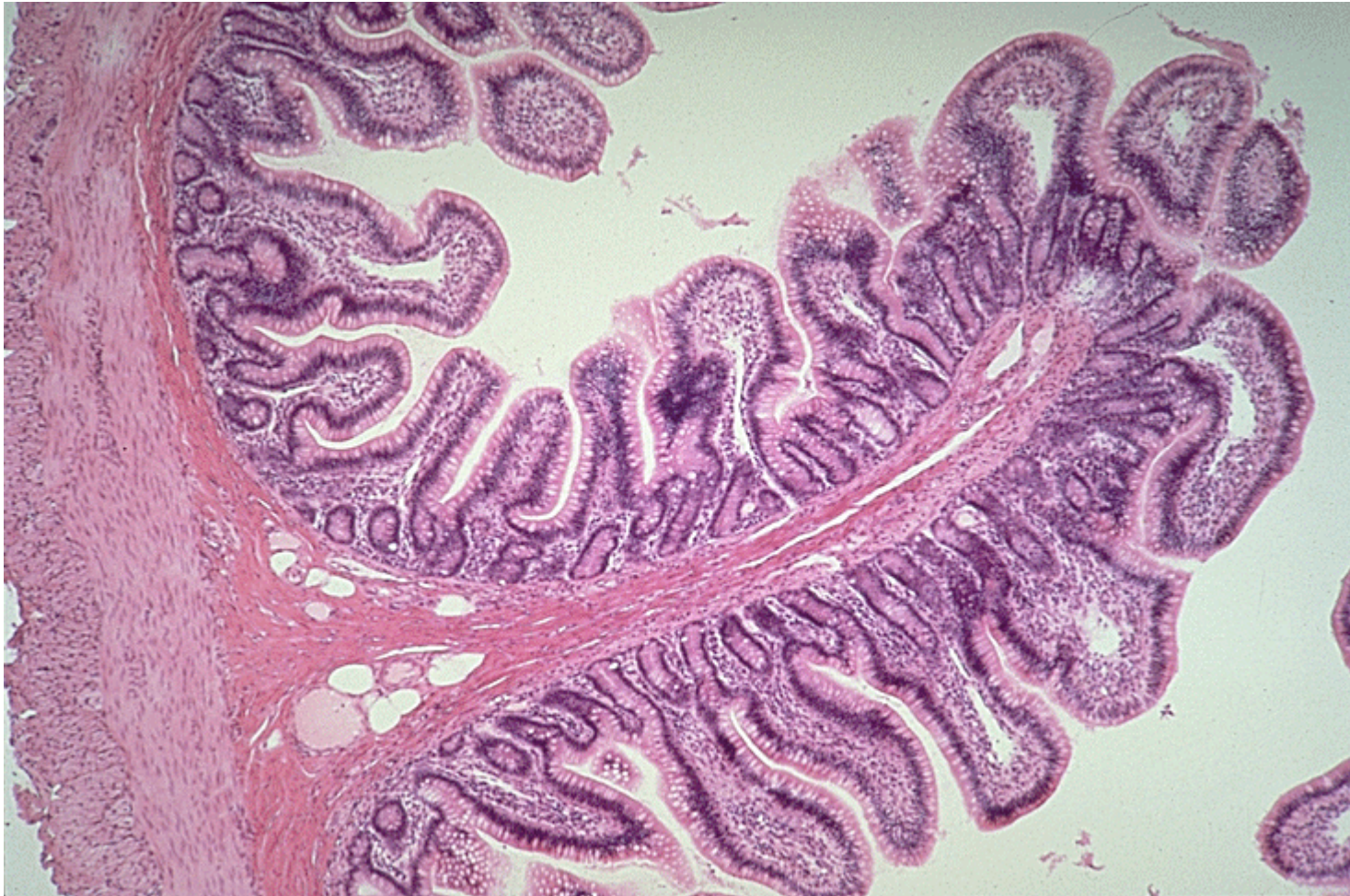
Jejunum

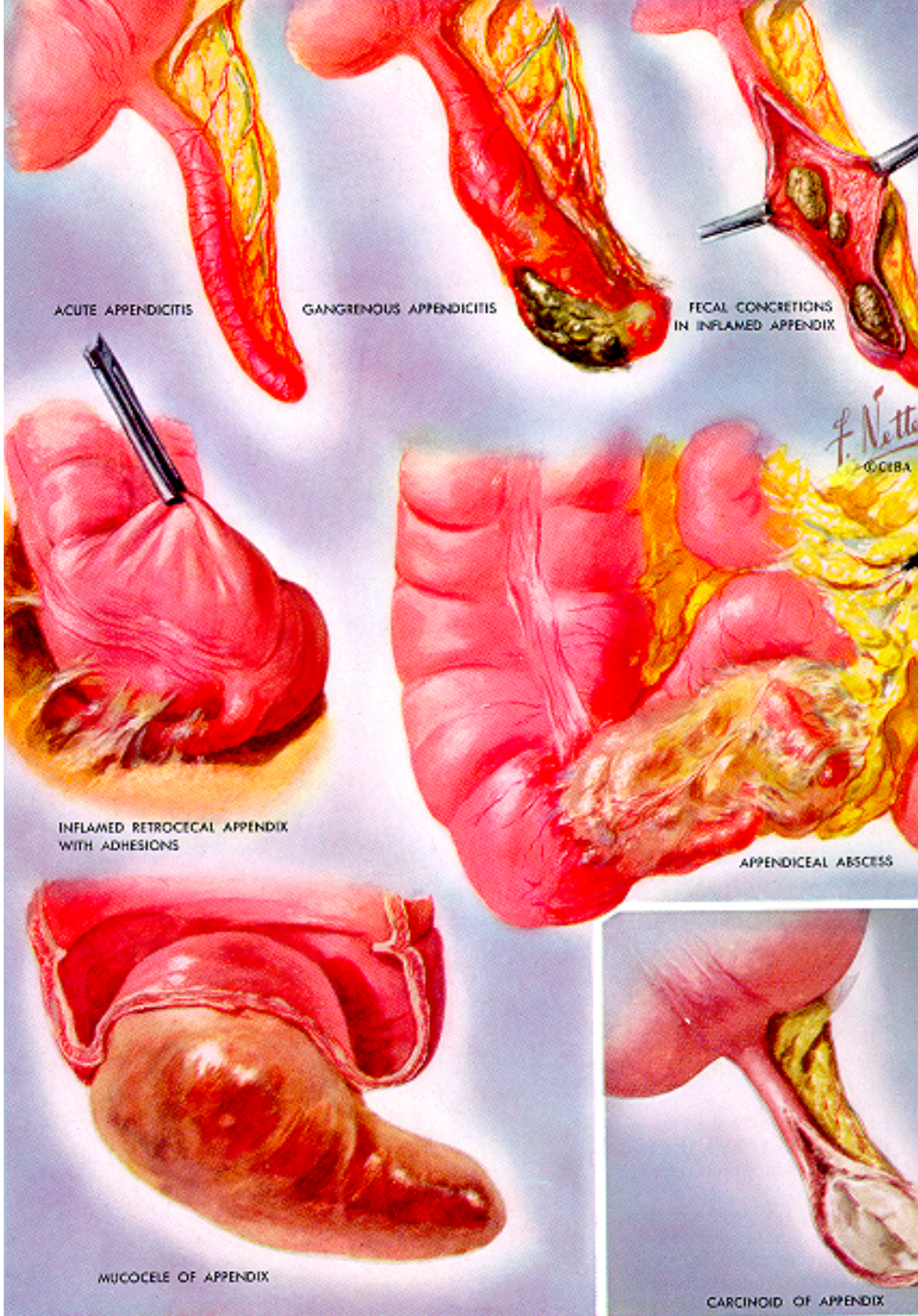


Duodenum Villi



Ileum, Plicae circularis and villi





ACUTE APPENDICITIS

GANGRENOUS APPENDICITIS

FECAL CONCRETIONS
IN INFLAMED APPENDIX

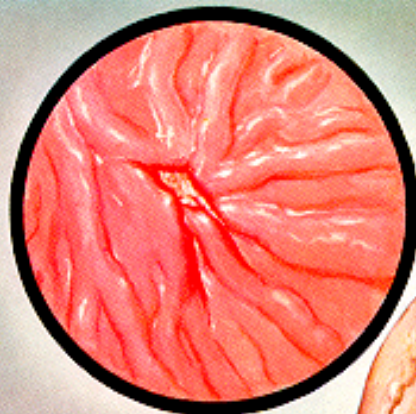
INFLAMED RETROCECAL APPENDIX
WITH ADHESIONS

APPENDICEAL ABSCESS

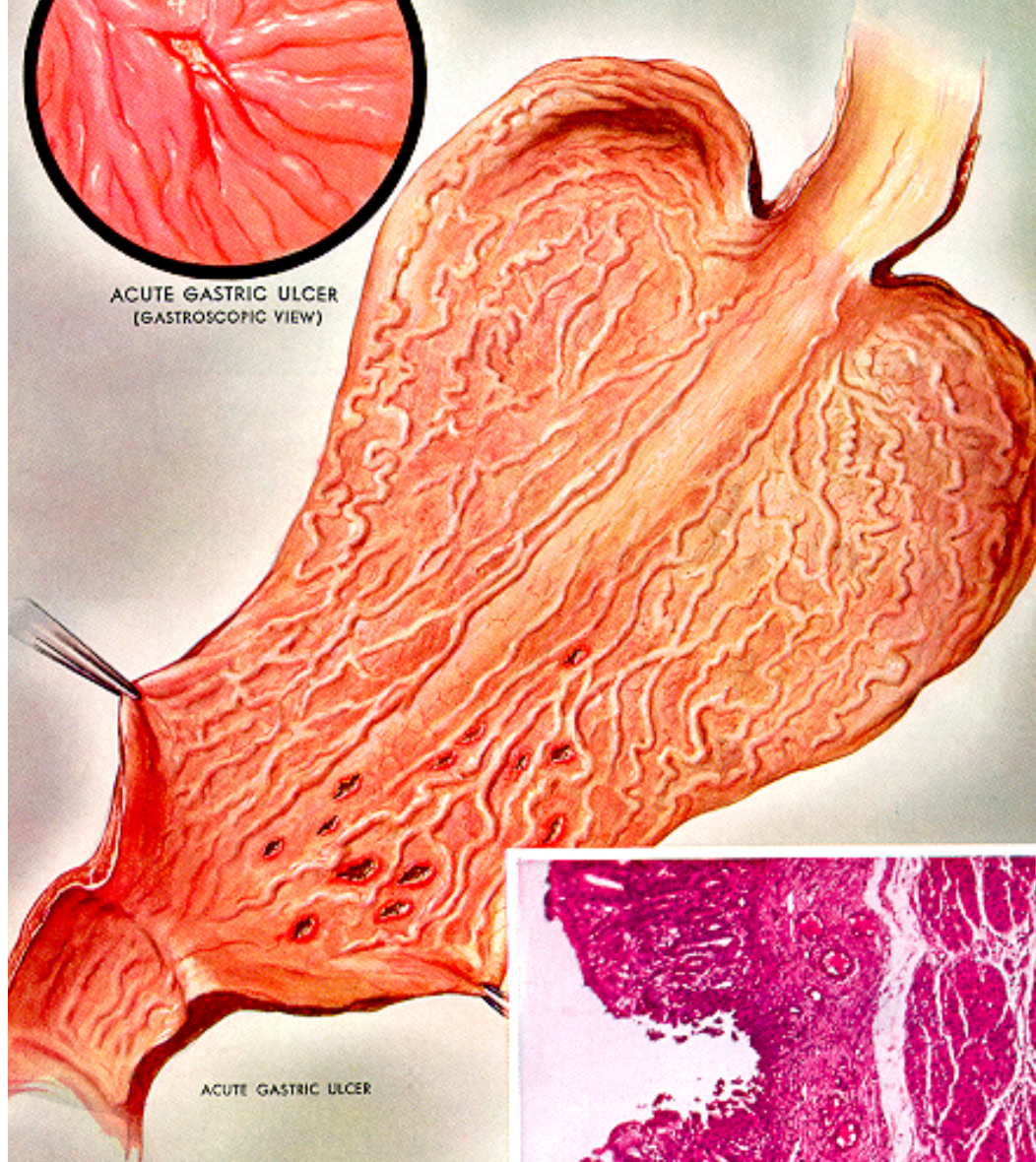
MUCOCELE OF APPENDIX

CARCINOID OF APPENDIX

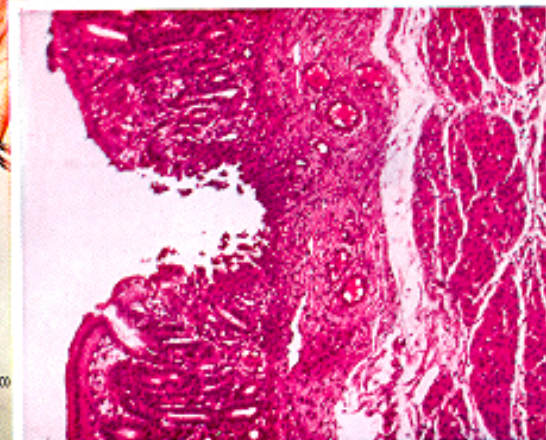




ACUTE GASTRIC ULCER
(GASTROSCOPIC VIEW)

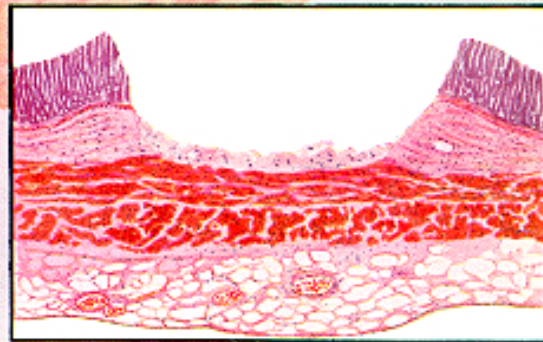
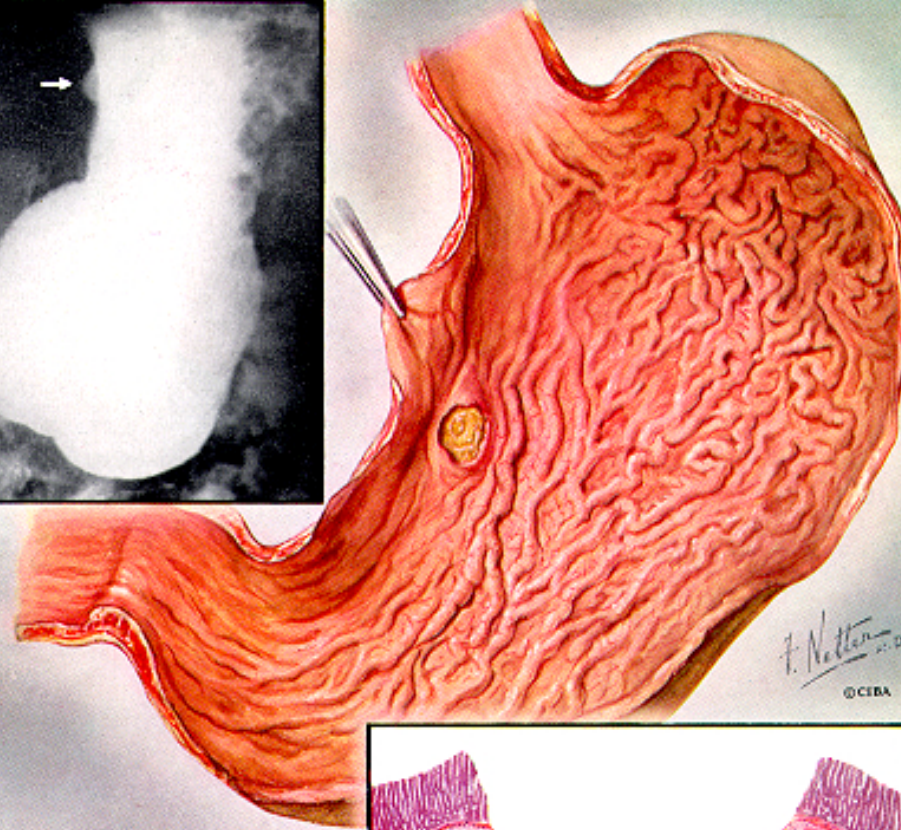


ACUTE GASTRIC ULCER



HEMALUM-EOSIN, X80

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SUBACUTE ULCER



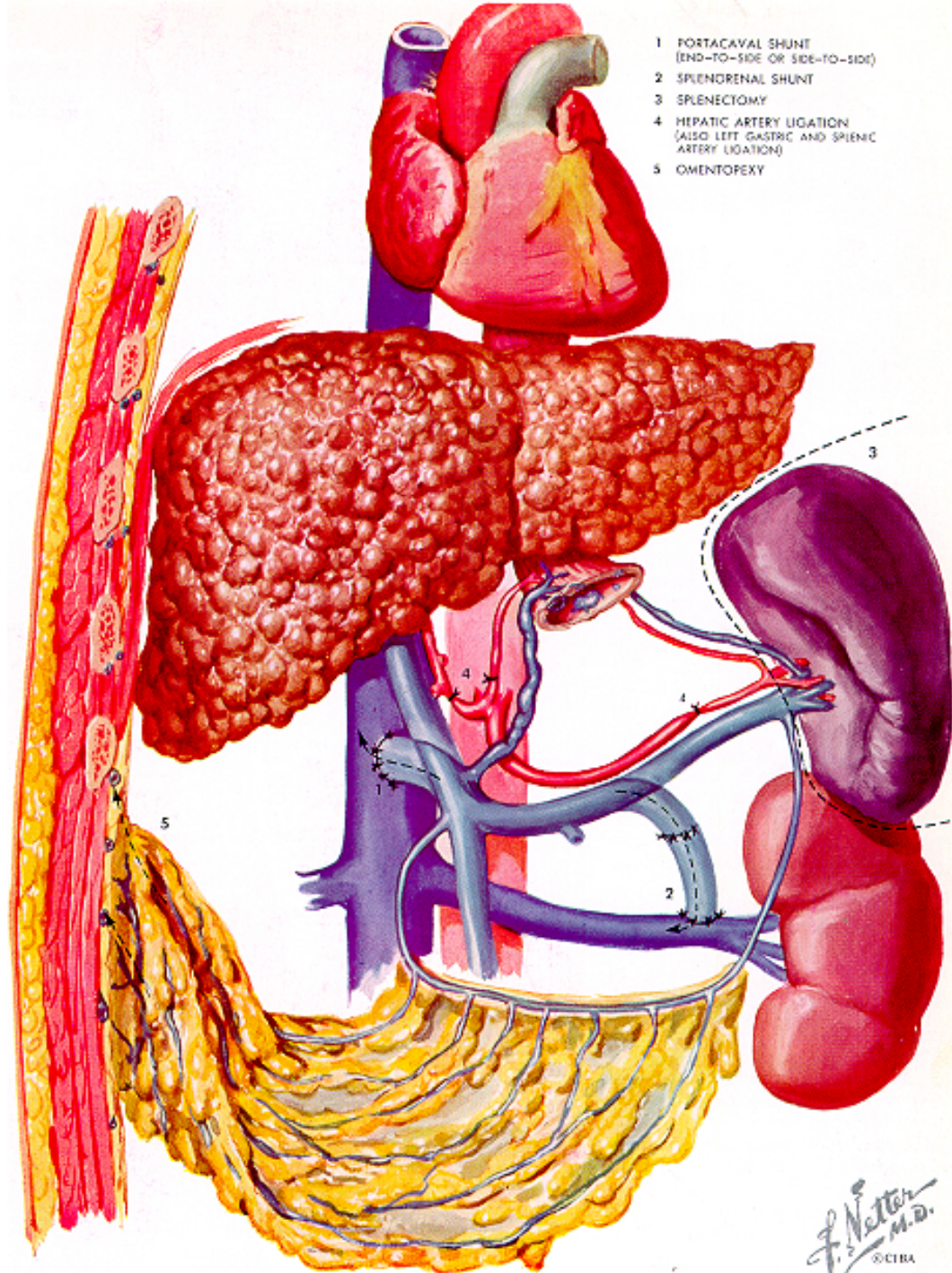
MUCOSAL ASPECT

SUBACUTE ULCER WITH CHRONIC CHANGES



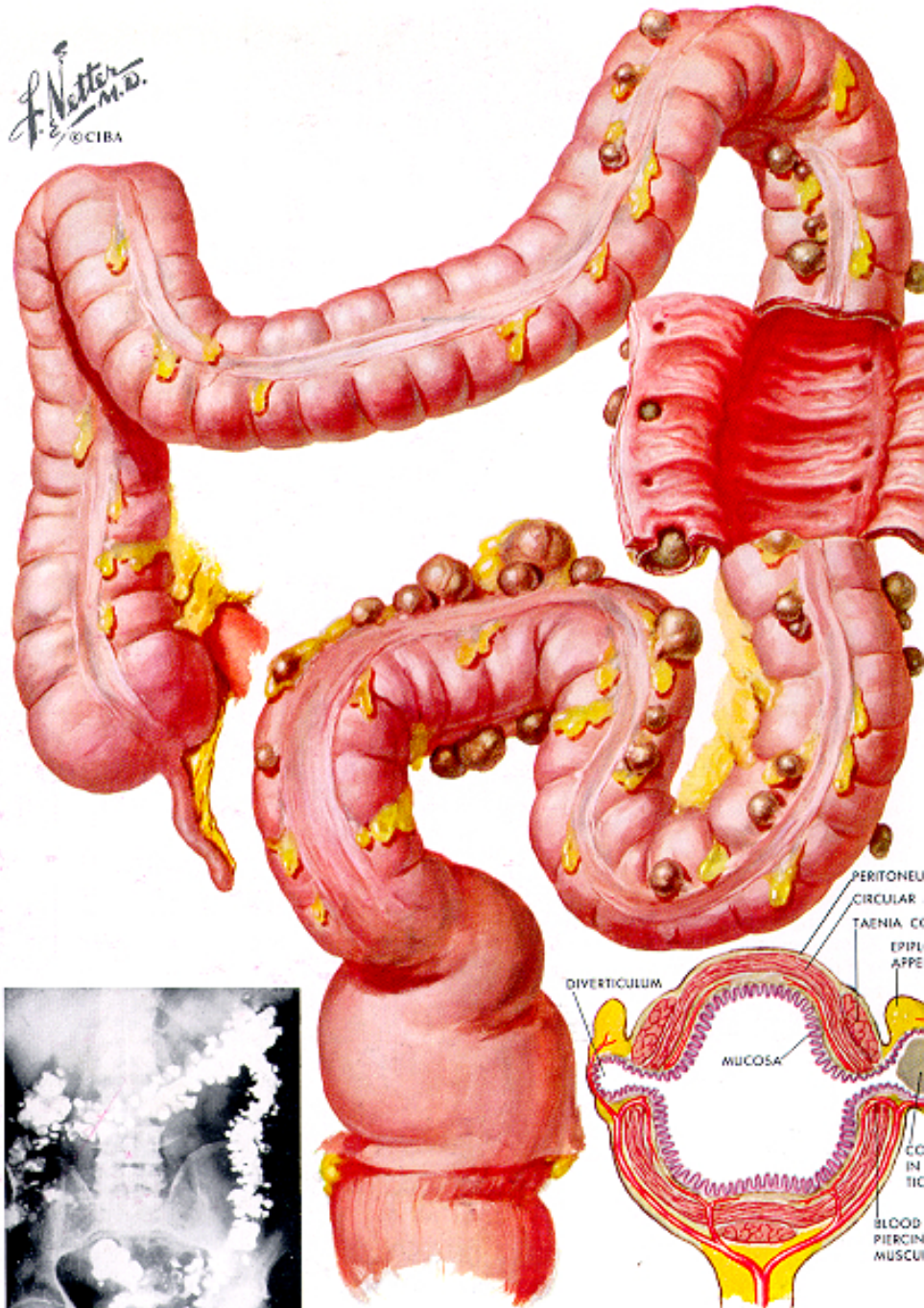
SEROSAL ASPECT

- 1 PORTACAVAL SHUNT
(END-TO-SIDE OR SIDE-TO-SIDE)
- 2 SPLEORENAL SHUNT
- 3 SPLENECTOMY
- 4 HEPATIC ARTERY LIGATION
(ALSO LEFT GASTRIC AND SPLENIC
ARTERY LIGATION)
- 5 OMENTOPEXY

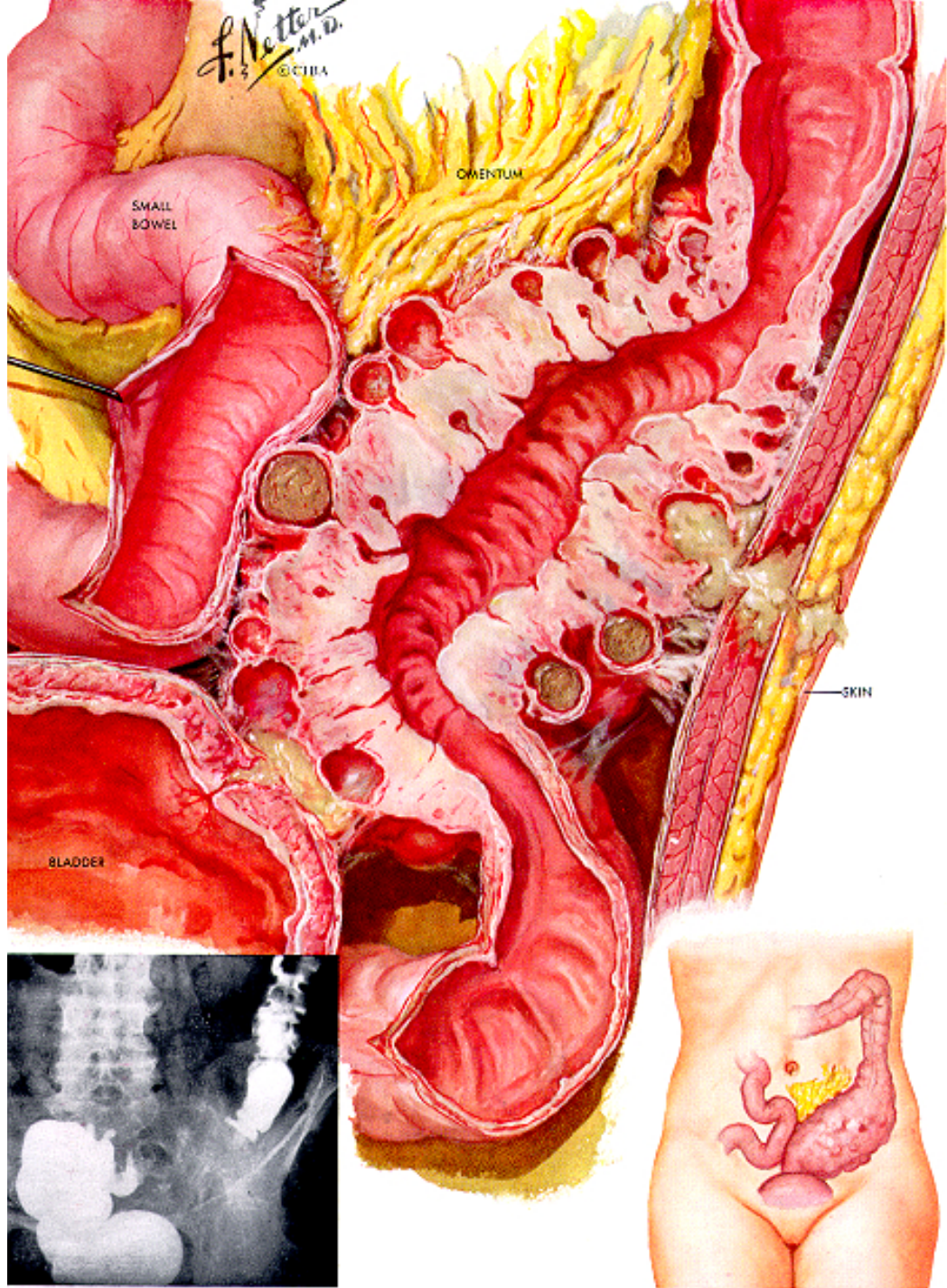


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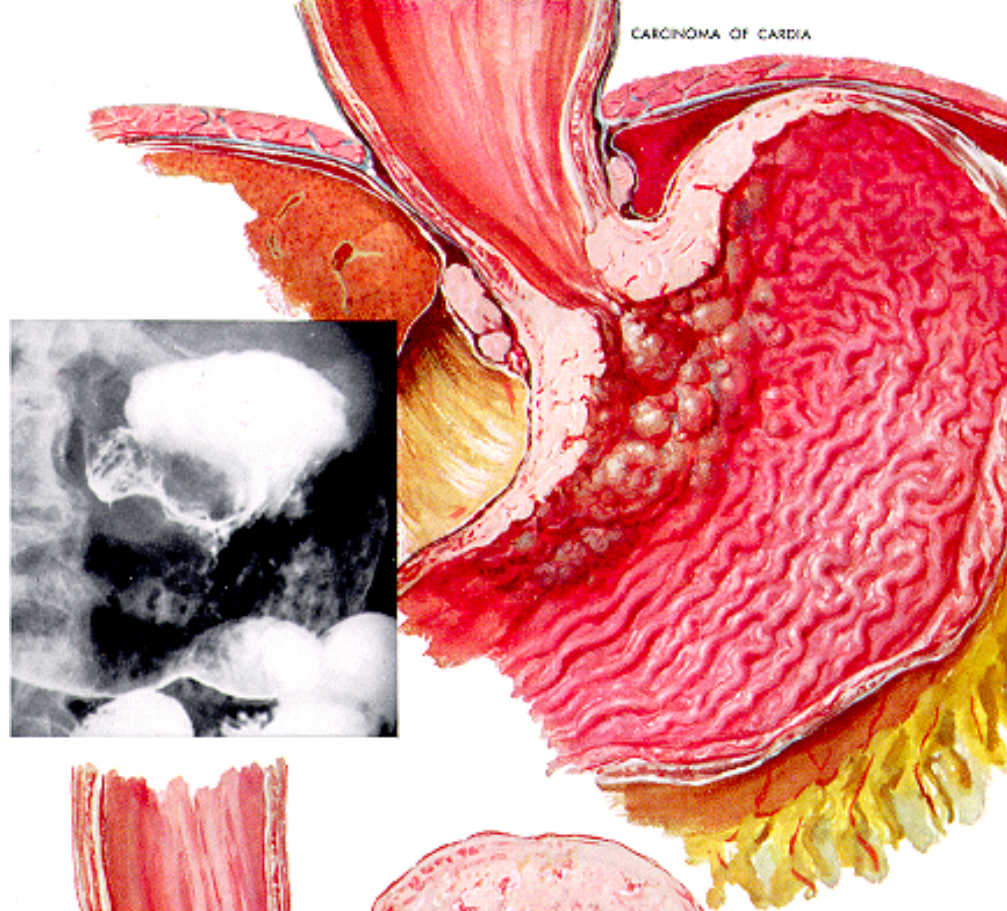
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RELATIONSHIP OF DIVERTICULA TO BLOOD VESSELS AND TAENIAE (SCHEMATIC)



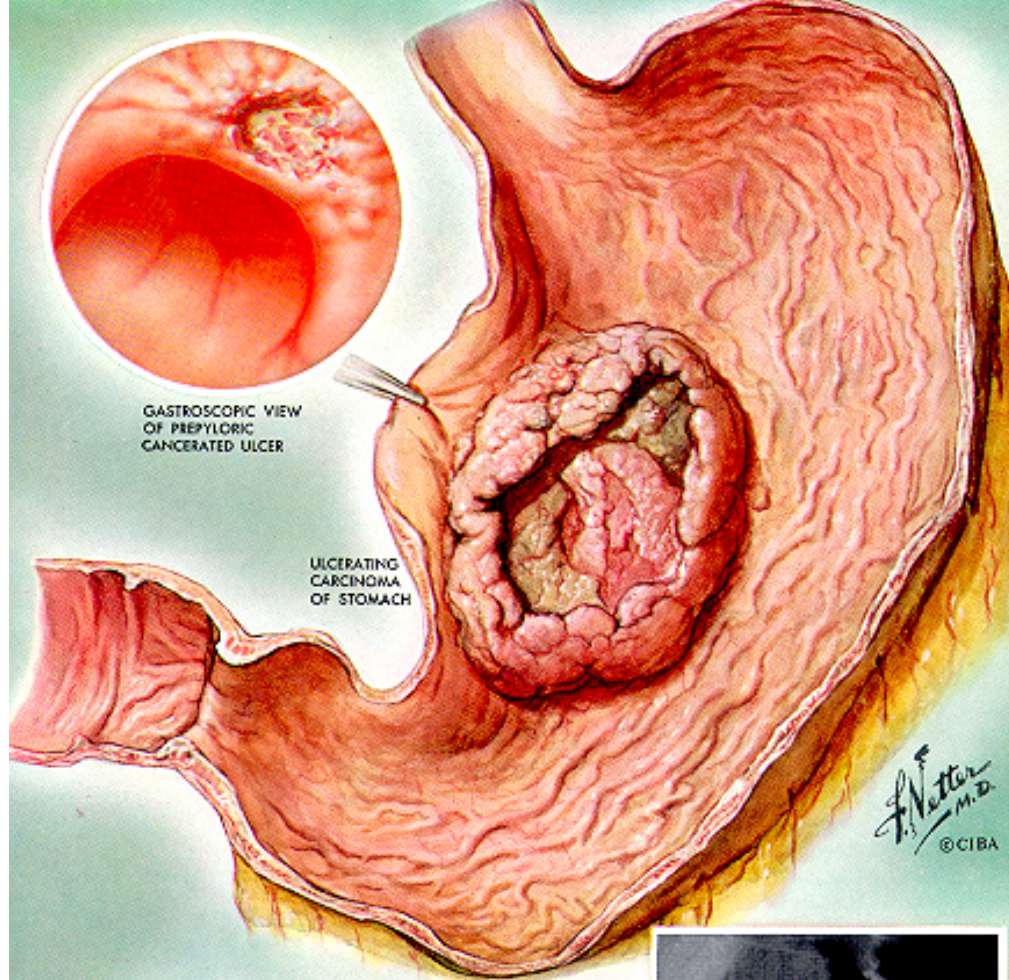
CARCINOMA OF CARDIA



CARCINOMA OF FUNDUS



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GASTROSCOPIC VIEW
OF PREPYLORIC
CANCERATED ULCER

ULCERATING
CARCINOMA
OF STOMACH

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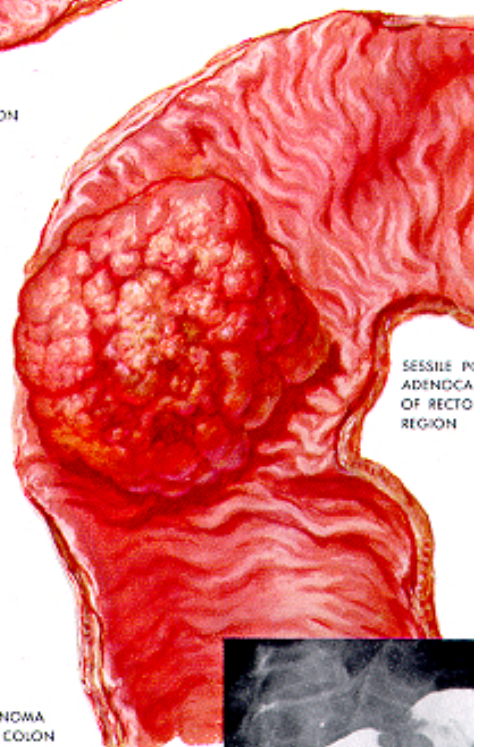


CARCINOMATOUS
DEGENERATION
OF ULCER

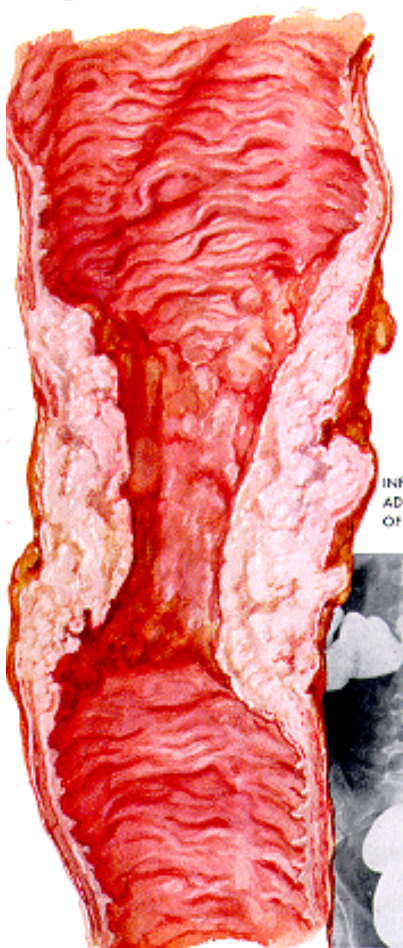




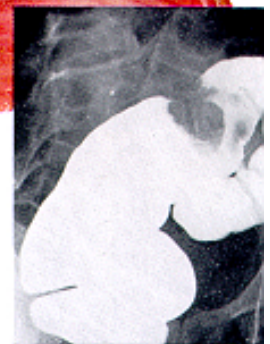
CONSTRICING
ADENOCARCINOMA
OF TRANSVERSE COLON

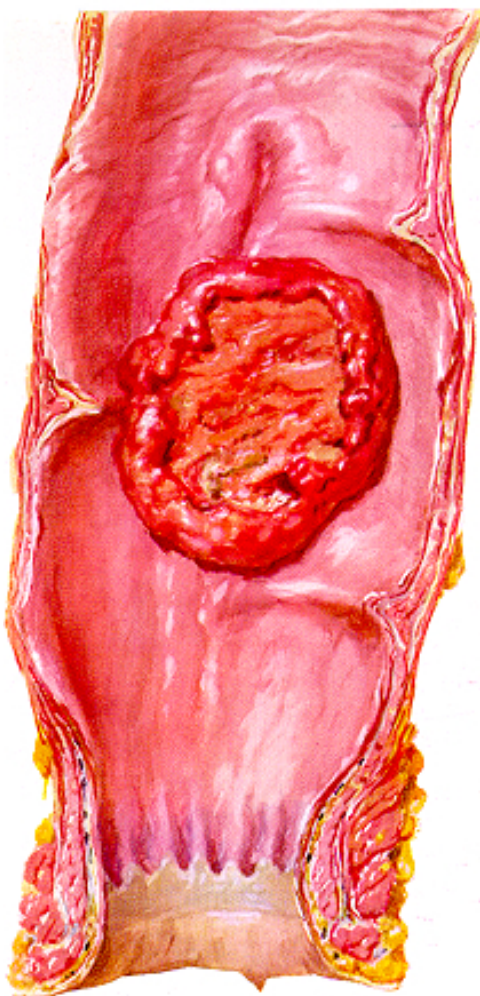


SESSILE
ADENOMA
OF RECTO
REGION



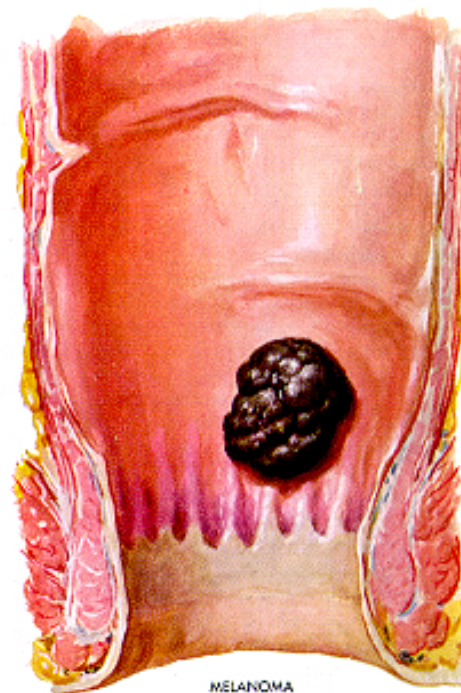
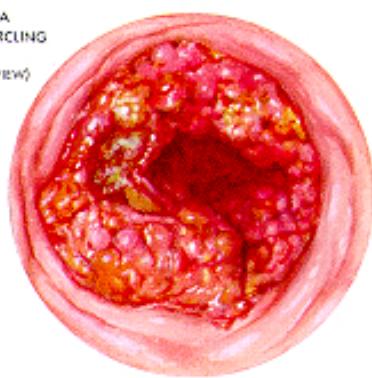
INFILTRATING
ADENOCARCINOMA
OF SIGMOID COLON



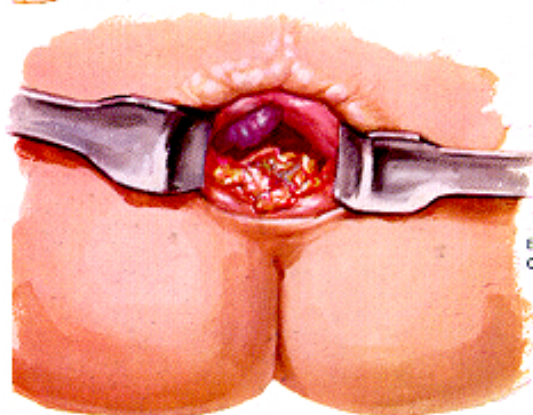


ULCERATED
CRATERIFORM
ADENOCARCINOMA
OF UPPER RECTUM

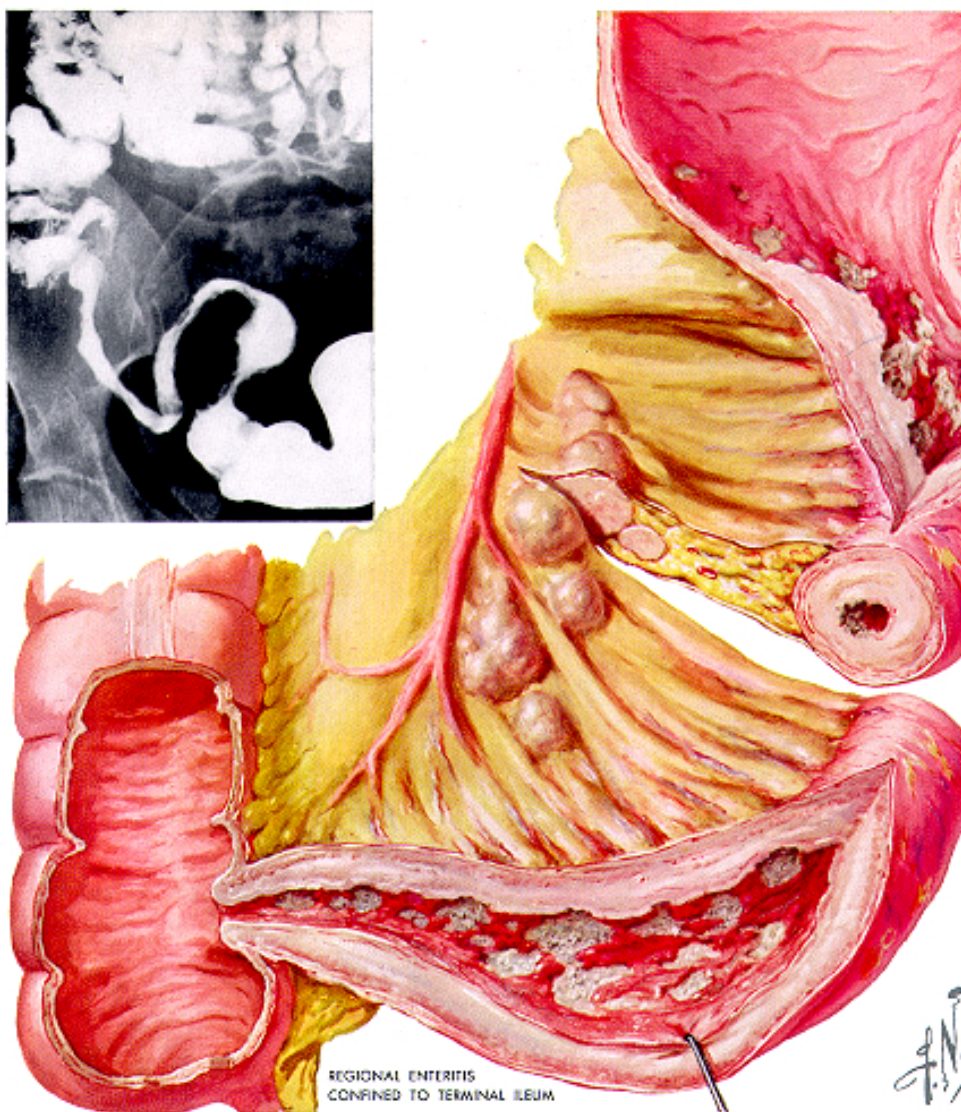
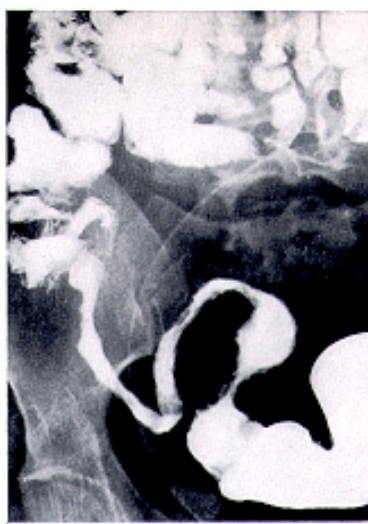
ADENOCARCINOMA
COMPLETELY ENCIRCLING
LOWER RECTUM
(SIGMOIDOSCOPIC VIEW)



MELANOMA



EPITHELIOMA
OF ANAL CANAL



REGIONAL ENTERITIS
CONFINED TO TERMINAL ILEUM

REGIONAL VARIATIONS



TERMINAL ILEUM

INVOLVING CECUM

UPPER ILEUM OR JEJUNUM

"SKIP" LESIONS

AT ILEOCOLOS