

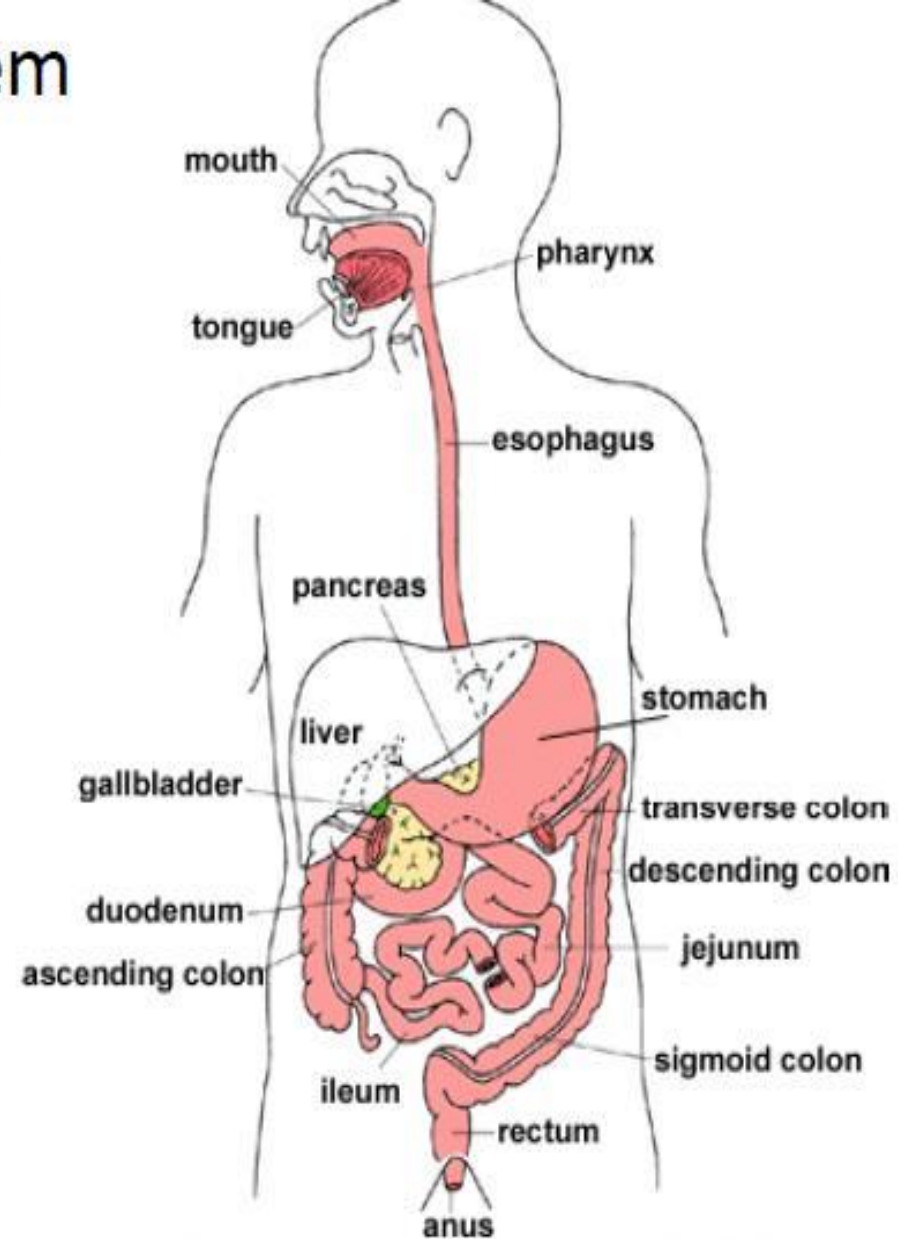
Bowel elimination

Gastrointestinal system

Ingested food is acted upon by physical and chemical means to provide the body with nutrients it can absorb and to excrete waste products.

Human Digestive System

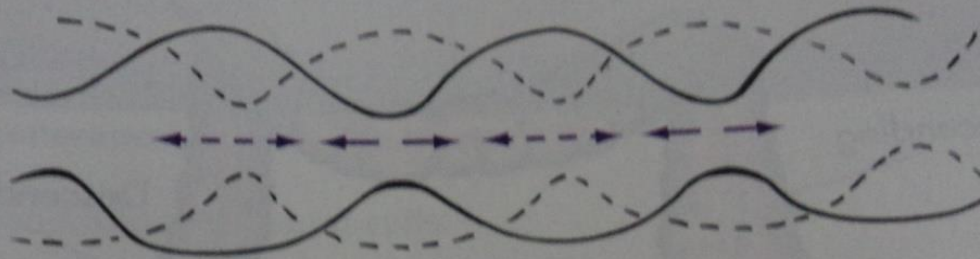
Organ	Substances digested	Enzymes
Mouth	starches	α -amylase and ptyalin
Esophagus	starches	α -amylase and ptyalin (from mouth)
Stomach	proteins	Pepsinogen (converted to active pepsin enzyme by HCl)
Duodenum	Proteins, starches, fats	Bicarbonate (HCO_3) ion from pancreas neutralizes acid so pancreatic enzymes can act
Jejunum, Ileum, small intestine	Absorption of digested nutrients	



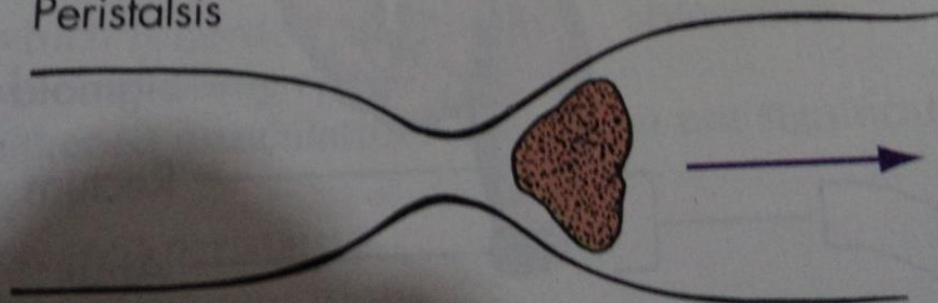
GI Review

- **Motility** – using smooth muscle, **peristalsis and segmentation**
- **Secretion** – Each day 7 liters of fluid are secreted by the digestive system. Ions, digestive enzymes, mucus, and bile. ~50% by the salivary glands, pancreas, and liver
- **Regulation**- CNS, Enter Nervous System, GI peptides
- **Digestion** – Absorptions of nutrients via mainly small & large intestines
- **Circulation**

Segmentation



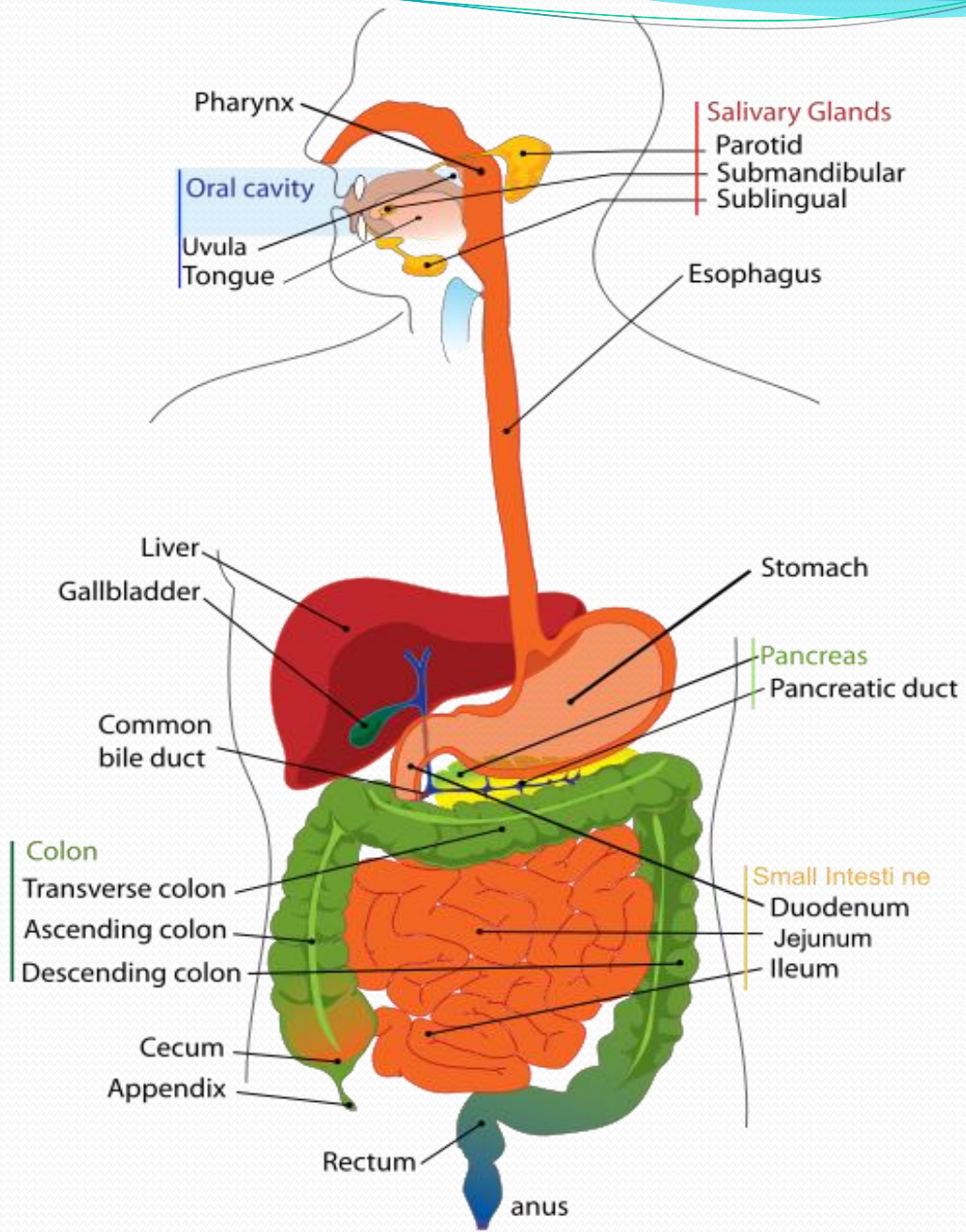
Peristalsis



- Mouth – mastication, digestion of starches
- Esophagus - transport
- Stomach -protein-digesting enzymes and strong acids to aid in food digestion, and also churns food
- Small Intestine - vast majority of digestion and absorption of food takes place; 5 meters in length;
 - Duodenum - the digestive juices from pancreas/liver mix together
 - Jejunum – midsection, absorption of fluid & nutrients
 - Ileum – end; absorption of fluids & nutrients
- Accessory Organs – Aid in digestion
 - Liver – bile (aids in fat digestion)
 - Gallbladder – reservoir of bile.
 - Pancreas – bicarbonate (neutralize acidic chyme) and several enzymes including trypsin, chymotrypsin, lipase, amylase,etc.

Large Intestine

- Primary organ of bowel elimination
- 125cm – 150cm length
- 7 sections
 - Cecum
 - Ascending colon
 - Transverse colon
 - Descending colon
 - Sigmoid (feces)
 - Rectum (arteries/vein)
 - Anus – internal & external sphincters
- Final absorption of water & nutrients, received as chyme
- Secretion of mucus; protective
- Formation & expulsion of feces



terms to know

- Constipation
- Defecation(is the act of passing stool diarrhea
- Diarrhea
- Anema
- Flatulence
- Fecal impaction
- Hemorrhoids
- Ileostomy, colostomy, stoma
- Paralytic ileus

Bowel Elimination

- **Defecation** – expulsion of feces;
- **Frequency** is highly individual, varying from several times per days to 2-3 times per week.
- **Feces**
 - 75% water, 25% solid materials
 - Color – due to digested bile and bacteria.

Factors that affect elimination

Developmental age

- Infants – immature; water not well absorbed; increased BMs
- Elders
 - Constipation - Decreased motility, inadequate fiber intake and muscle weakness. BM decreased.

Diet

- Foods – gas, laxative, constipation
- Fluid – for healthy elimination need 2-3 liters/days

Activity – bed confined → often constipated

Psychological facts

- Emotional stress increases GI motility
- Depression may cause constipation
- Pre-occupied with BM – usually elderly

Medications

- Narcotics, iron → constipation
- Laxatives, antibiotics → diarrhea
- ASA, NSAIDs → bleeding

Diagnostics Test

- Bowel prep → diarrhea
- Barium → constipation

Anesthesia – slowed

Surgery

- Direct handling of intestine → Ileus ; 1-2 days.

Bowel elimination problems

- **Constipation**
- **Impaction**
- **Diarrhea**
- **Bowel incontinence**
- **Bowel Diversion ostomies**
- **Hemorrhoids**

Constipation

- fewer than 3 bowel movements per week. Hard, dry feces or no stool at all.
- Compare to person's regular elimination patterns
- Common cause
 - Insufficient diet/fluids
 - Inactive or depression
 - Chronic laxative usage
- Medications
- Pathologic causes – Cancer, obstruction

Medication to help – laxatives (dulcolax), colace, Metamucil, mineral oil, enema.

Impaction

- Results from unrelieved constipation
- Collection as collection of hardened feces, cannot be expelled
- Inability to pass for several days plus abdominal distention, anorexia, pain.
- **Solution: enema or disimpaction**

Diarrhea

- Increased frequency of loose stools
- Commonly fatigues, weak, cramping
- Common causes
 - Food intolerance
 - Cancer
 - Infection (bacterial or viral) → can be obtained analysis.
 - Medication
- May cause dehydration and skin breakdown

Medication – Lomotil/Immodium. In elderly, be sure there is no bacterial issue such as C. difficile.

Bowel incontinence

- Involuntary passage of stool
- Any condition that impairs anal sphincter control
- Neuromuscular diseases, spinal cord trauma, tumors
- Problems with embarrassment, skin breakdown, infections.

Hemorrhoids

- Increased **venous** pressure in rectal area from straining at defecation, pregnancy, chronic heart failure, liver disease
- Pain, burning, bleeding

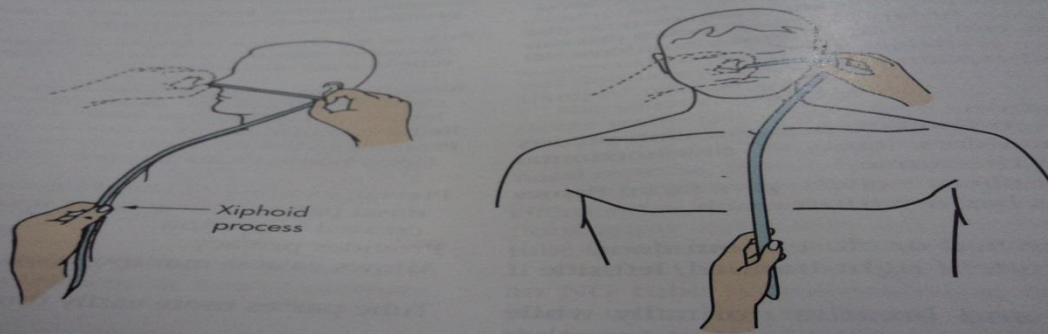
Solution: diet modifications, creams, stool softeners, cautery bleeding.

Bowel Diversion Ostomies

- Ostomy – opening for gastrointestinal elimination onto the skin.
- Upper GI → for feeding
- Lower GI (colostomy) → diverts and drains fecal material.
- Stoma (opening on skin)
 - Temporary – trauma or inflammation
 - Permanent – cancer.

NG Tube

- Inserted to decompress or drain the stomach of fluid or unwanted stomach contents.
- Used to allow the gastrointestinal tract to rest before or after abdominal surgery to promote healing.
- Inserted to monitor gastrointestinal bleeding



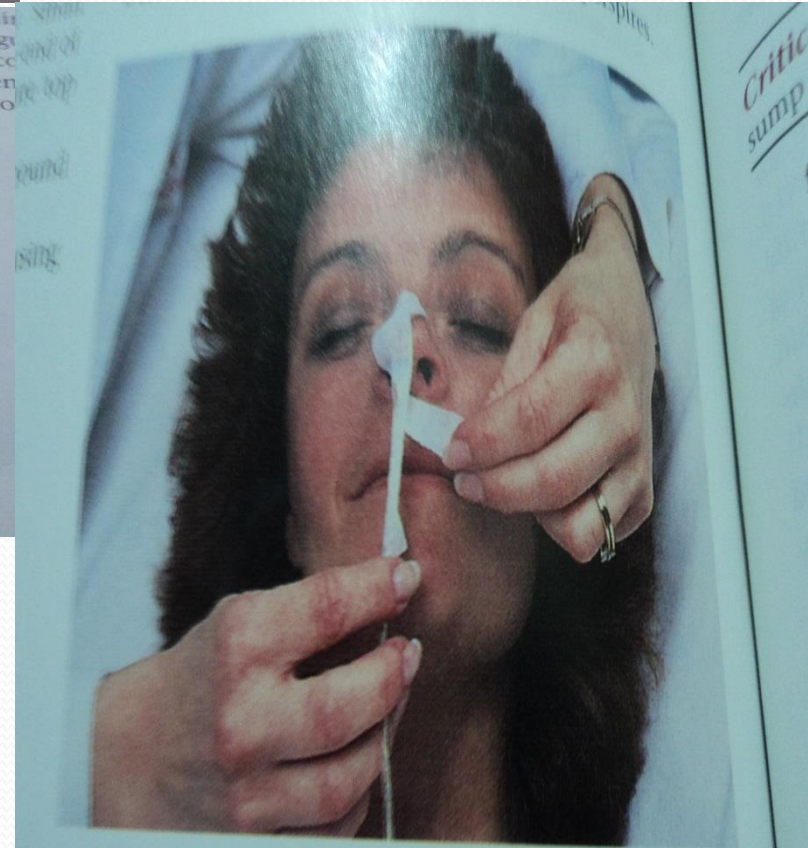
STEP 14a Technique for measuring distance to insert NG tube.

NG Tube



STEP 19 Insert NG tube with curved end pointing downward.

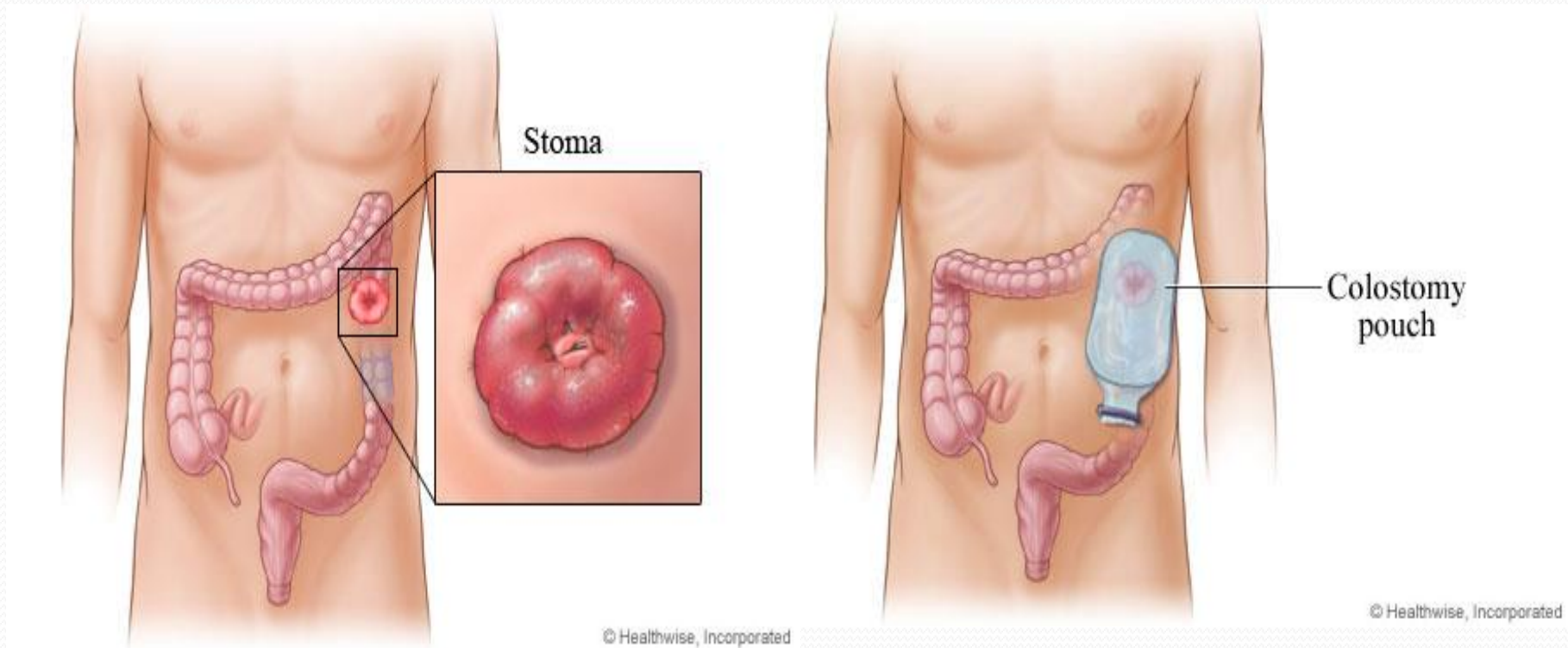
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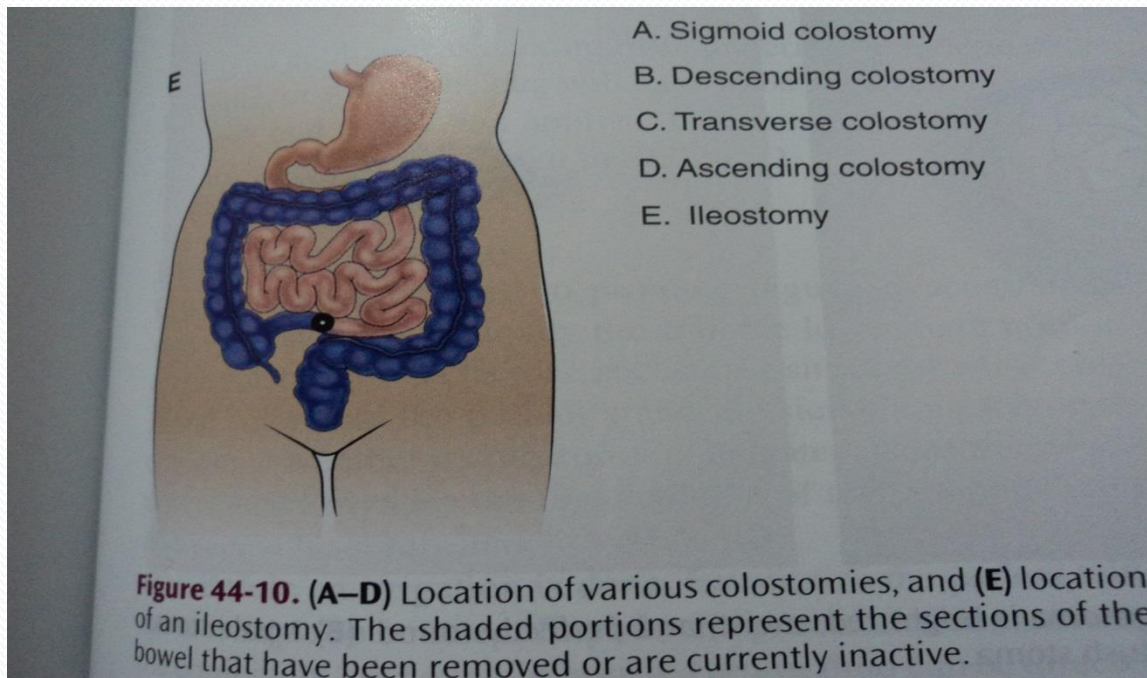
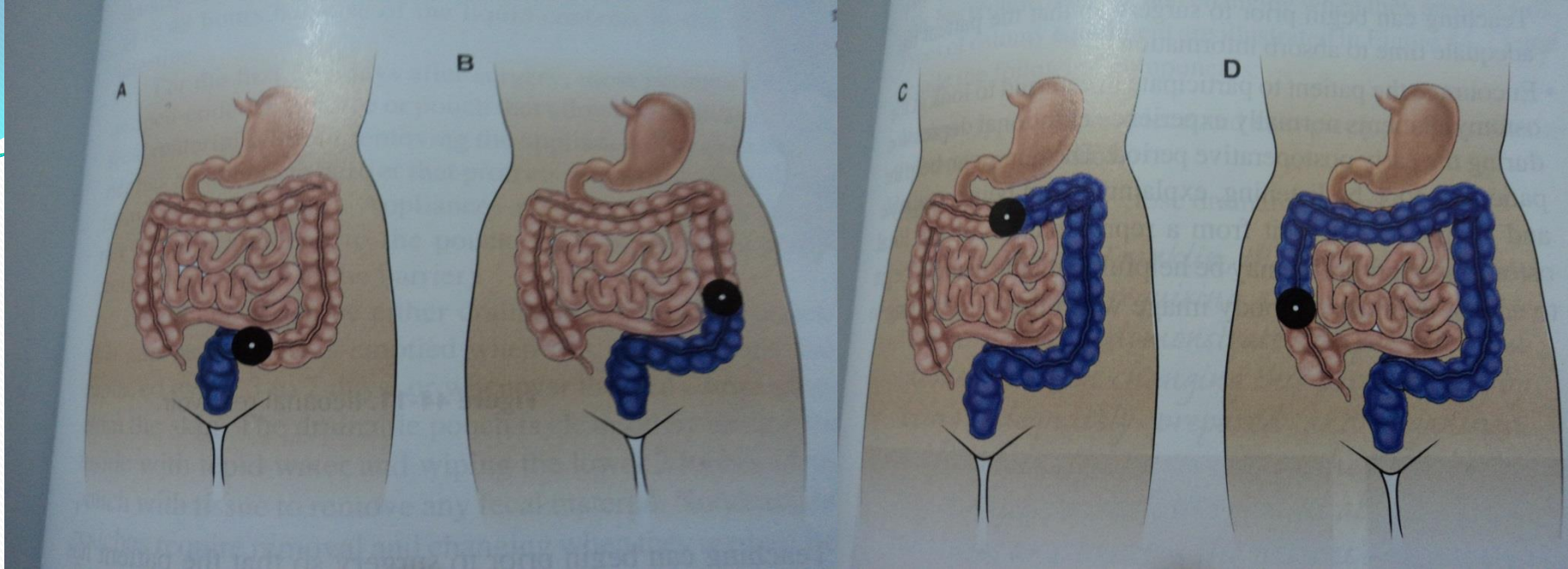


STEP 28b(2) Tape is crossed over and around NG tube.

STOMA

Normal stoma is red/pink and moist
Problem if stoma is purple/blue
meticulous skin care





- A. Sigmoid colostomy
- B. Descending colostomy
- C. Transverse colostomy
- D. Ascending colostomy
- E. Ileostomy

Figure 44-10. (A–D) Location of various colostomies, and (E) location of an ileostomy. The shaded portions represent the sections of the bowel that have been removed or are currently inactive.

Nursing Assessment

“Normal” is different for each

- description of stool
- Diet/fluid intake
- Activity/exercise
- Pain or other GI symptoms
- Inspection
 - Abdominal symmetrical & soft
 - No abdominal distention
-
- Auscultation ~5-35 gurgles/min
 - Hyperactive (diarrhea, ileus)
 - Absence – obstruction
- Palpation → no tender, no masses
- Percussion –Dull over solid masses

Stool Characteristic

Color : Brown, Infant: yellow

- Consistency: Soft, semisoft
- Shape
- Amount : Variable
- Odor :Mildly aromatic
- Constituents: Roughage, bacteria, fat, protein, digestive juices

Stool test

Blood → (occult or present)

- White blood cells
- Ova & parasites
- Stool culture
- Clostridium Difficult Toxin - bacteria
- Fecal fat – lactose intolerance

Some Diagnostics Procedure of bowel

- **Upper GI/Barium swallow**
 - x-ray using barium (opaque contrast medium)
 - “small bowel follow through” will examine duodenum and small bowel
- **Barium enema**
 - x-ray with barium of the lower GI tract.
- **Colonoscopy**
 - examination of large intestine with flexible endoscope