Large Intestine

Objectives
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• Colon is 90 cm to 150 cm long
• Diameter is 4 to 6 cm
• Extends from the ileocecval valve to the anus and is divided into five sections
  – The ascending
  – Transverse
  – Descending
  – Sigmoid colon
  – Rectum
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- Cecum-the first part of the large intestine, forming a dilated pouch into which open the ileum, the colon, and vermiform appendeix
- Vermiform appendix-a worm-like diverticulum of the cecum, ranging from 3-6 inches in length, it has no known digestive role.
- Ascending colon- the portion of the large intestine between the cecum and the hepatic flexure
- Transverse colon- the portion of the colon that runs transversely across the upper part of the abdomen, from the right to left colic flexure or splenic flexure
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- Descending colon - left side of abdomen from the spleen to the iliac crest
- Sigmoid colon - the S-shaped part of the colon, lying in the pelvis, extending from the pelvic brim to the third segment of the sacrum, and continuous above with the descending colon and below the rectum
- Rectum - the distal portion of the colon, beginning anterior the third sacral vertebra as a continuation of the sigmoid and ending at the anal canal
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• The wall of the large intestine has four layers
  – The serosa
  – The muscularis
  – The submucosa
  – The mucosa
  – The outer serous layer if formed by visceral peritoneum, the rectum does not have a serous layer
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- Motility- three basic patterns of movement
  - Periodic uncoordinated tonic contractions for segmentation of both the longitudinal and circular muscles bunch up the fold of the mucosa, forming the haustra
  - Phasic- random, nonpropulsive contractions, peristalsis and retrograde peristalsis, which mix the stool material and help absorb its liquid contents with advancing the material toward the anus.
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• Motility
  – Spontaneous mass movement occur three or four times a day when the colon becomes filled and distended
  – Valsalva maneuver, the involuntary movement of the bowel wall and the relaxation of the external sphincter are assisted by contraction of the diaphragm and the thoracic and abdominal muscles
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• Secretion
  – Colonic secretion is scanty and consists primarily of water, mucus, potassium and bicarbonate
  – The alkaline mucus secreted by goblet cells in the crypts lubricates the intestinal walls, protects the mucosa from acidic bacterial action and helps lubricate the passage of stool
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• Absorption and elimination
  – 1000 to 2000 ml of liquid chyme enters the colon daily, only 150 to 250 ml of fluid is evacuated in the stool.
  – The colon absorbs sodium, chloride, and water, with the most absorption being accomplished in the ascending colon.
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• Polyps
  – Colonic polyps are discrete tissue masses that protrude into the lumen of the bowel.
    • Pedunculated- are attached to the intestinal wall by a stem.
    • Sessile- attach directly to the intestinal wall
    • Diagnosis- colonoscopy, proctosigmoidoscopy, air-contrast barium enema
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• Juvenile Polyps
  – Found in children, benign, also called retention or inflammatory polyps
  – Rarely found in infants, increase in age and peak of occurrence between ages 5 and 6
  – Uncommon after early adolescence
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• Familial polyposis coli
  inherited as an autosomal dominant trait, hundreds of adenomatous polyps develop throughout the colon.
  hematochexia, diarrhea, abd pain and intestine obstruction.
  can become cancerous, surgery is strongly recommended
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• Gardner’s Syndrome
  – Multiple adenomatous polyps appear along the colon or other parts of the GI tract, and osteomas appear on the mandible, skull and long bones.
  – Is familial and colonic resection is recommended
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• Peutz-Jeghers syndrome
  – Inherited as an autosomal-dominant trait,
  – Harmartomatous polyps and abnormal brown pigmentation of the lips, oral mucosa and skin
  – Polypoid lesions have been noted outside the GI tract, and abdominal pain caused by mechanical blockage or intussusception is the most common symptom. Risk of cancer
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- Angiodysplasia- vascular dilatations in the submucosa that consist of arteria, venous and capillary elements. Occur most frequently in the cecum and right colon but may be found throughout the GI tract. Osler-Weber-Rendu disease-(hemorrhagic telangiectasis) angiodyplasias occur throughout the GI tract and on the skin, nail beds and in the mouth and nasopharynx.
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- Colitis- an inflammation of the colon
  - Ischemic colitis
  - Necrotizing enterocolitis
  - Ulcerative colitis
  - Pseudomembranous colitis
  - Crohns colitis
  - Radiation colitis
  - Cow’s Milk protein-induced enterocolitis
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• Necrotizing Enterocolitis (NEC) is a disease of focal or diffuse ulceration of the GI tract that usually occurs in the distal small bowel and/or colon
• Exclusively in the neonatal period
• Presentation varies from insidious to acute and fulminant
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- **Ulcerative Colitis**
  - Chronic, recurrent inflammation that affects the mucosa and submucosa of the colon
  - Originates in the lower colon and then spreads proximally.
  - Diffuse ulceration and hemorrhage, with congestion and edema, exudative inflammation in the lamina propria and submucosa. Crypt abscesses form, necrotic leading to bloody, mucous stools.
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• Pseudomembranous colitis
  – Is an acute inflammation of the bowel mucosa, with the formation of pseudomembranous plaques overlying an area of superficial ulceration
  – Antibiotic associated colitis or diarrheha
  – Great majority of cases involve a toxin produced by C. difficile which is a spore-forming, gram+ anaerobic rod capable of producing may toxic factors
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• Crohns colitis
  – Maybe confined to the colon or may be associated with the small bowe,
  – May resemble UC
  – Ulceration is often longitudinal and involves the full thickness of the bowel
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• Radiation Enteritis
  – Injury to the intestine, usually occurring as a result of radiotherapy for pelvic, intra-abdominal or retroperitoneal malignancies
  – Acute phase occurs during tx and is related to alterations in the epithelial cell function.
  – Nausea, cramping and altered bowel habits.
  – Chronic phase results from abnormalities in vascular and connective tissues
  – Symptoms may appear 3 months to 30 years
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• Cow’s milk protein-induced enterocolitis
  – Present soon after birth or up to 6 months
  – Manifiestion vomiting, diarrhea, poor weight
  – Gain, hematochezia and irritability,
  – Unknown as to what causes the hypersensitivity
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• IBD
  – is the most common GI disorder
  – Is the most frequent reason for outpt visits to the GI Dr.
  – Symptoms altered bowel habits and abdominal pain that is directly related to the change in the pattern of bowel movements.
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• Chronic recurrent abdominal pain syndrome
  – Common disorder in childhood and adolescents
  – Is thought to be manifestation of IBS in pediatric
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• Parasitic infection
  – Amebiasis
    • Form of colitis caused by the protozoan
      – Entamoeba histolytica
  – Trypanosomiasis
    • Chronic illness caused by protozoan
      – Trypanosoma
        » Chaga’s Disease—which is transmitted primarily by the bite of the reduviid bug, also transmitted by blood transfusions, damage to the placenta during delivery or contaminated food.
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• Diverticular Disease
  – Affects 33 to 50% of the population age 80 or older
  Characterized by herniation at weak points on the intestinal mucosa and submucosa
  most often descending and sigmoid colon
    Hypertrophy of segments colon circular muscle, increased intracolonic pressure, age related atrophy or weakness bowel muscles
  chronic constipation/straining, lack of fiber, obesity
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- Diverticulosis
  - Uncomplicated diverticular disease
  - Show no signs of infection
  - Most are asymptomatic

- Diverticulitis
  - An inflammation in the wall of the diverticulum at the apex and rarely at the neck.
  - Common symptoms, fever and left lower quadrant pain, n&v, constipation
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• Colorectal cancer
  – is the second most common cancer in adults
  – Occurs in persons 50 to 80
  – Approx 95% intestinal cancer are adenocarcinomas
  – Risk Factors
    • Diet high in fat
    • Increasing age
    • Family history (Fm hx)
    • Previous colon cancer
    • Personal history of adenomatous polyps
    • Familial polyposis or Gardner syndrome
    • Ulcerative colitis (UC) for more than 7 years
    • Genital cancer or breast cancer (in women)
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• Mechanical obstruction
  – Hershsprung’s disease
  – Is congenital absence of intramural ganglia of the anorectum and variable lengths of the distal colon, resulting in failure of relaxation of the contracted segment and internal sphincter, followed by obstructive symptoms and dilatation of the more proximal normal colon
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- Neurogenic obstructions
  - No mechanical blockage, this anomaly result from ineffective intestinal peristalsis

Vascular obstructions
  occurs when emboli or artherosclerotic narrowing interrupts the blood supply to the bowel

Obstipation
  failure to pass flatus and abdominal distention
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- Anorectal disorders
  - Hemorrhoids
    - Vascular masses in the anal canal
  - Fecal impactions
    - Formation of large, firm, immovable mass of stool that occurs when normal movement of feces is impaired
  - Encopresis
    - Is a condition of chronic constipation that results in involuntary leakage of feces, causing soiling
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- **Anorectal fistula**
  - is a hollow, fibrous tract leading from the anal canal or rectum to the perianal skin and often results from an anorectal abscess
- **Rectal Prolapse**
  - Occurs when the rectum mucosa bulges through the anus,
- **Anal Fissure**
  - Is a thin tear of the superficial anal mucosa
  - Commonly occurs along the midline of the posterior anal canal