Overview of Anatomy and Physiology

Digestive system

- Organs and their functions
  - Mouth: Beginning of digestion
  - Teeth: Bite, crush, and grind food
  - Salivary glands: Secrete saliva
  - Esophagus: Moves food from mouth to stomach
  - Stomach: Churn and mix contents with gastric juices
  - Small intestine: Most digestion occurs here
  - Large intestine: Forms and expels feces
  - Rectum: Expels feces

Overview of Anatomy and Physiology

Accessory organs of digestion

- Organs and their functions
  - Liver: Produces bile; stores it in the gallbladder
  - Pancreas: Produces pancreatic juice

Regulation of food intake

- Hypothalamus
  - One center stimulates eating and another signals to stop eating

Laboratory and Diagnostic Examinations

- Upper GI series
- Gastric analysis
- Esophagogastroduodenoscopy (EGD)
- Barium swallow
• Bernstein test
• Stool for occult blood
• Sigmoidoscopy
• Barium enema
• Colonoscopy
• Stool culture and sensitivity; stool for ova and parasites
• Flat plate of the abdomen
• Disorders of the Mouth
  • Dental plaque and caries
    ▪ Etiology/pathophysiology
      • Erosive process that results from the action of bacteria on carbohydrates in the mouth, which produces acids that dissolve tooth enamel
    ▪ Medical management/nursing interventions
      • Remove affected area and replace with dental material
  • Disorders of the Mouth
    • Candidiasis
      ▪ Etiology/pathophysiology
        • Infection caused by a species of Candida, usually Candida albicans
        • Fungus normally present in the mouth, intestine, and vagina, and on the skin
        • Also referred to as thrush and moniliasis
      ▪ Clinical manifestations/assessment
        • Small white patches on the mucous membrane of the mouth
        • Thick white discharge from the vagina
  • Disorders of the Mouth
Candidiasis (continued)

Medical management/nursing interventions
- Pharmacological management
  - Nystatin
  - Ketoconazole oral tablets
- Half-strength hydrogen peroxide/saline mouthwash
- Meticulous handwashing
- Comfort measures

Disorders of the Mouth

Carcinoma of the oral cavity
- Etiology/pathophysiology
  - Malignant lesions on the lips, oral cavity, tongue, or pharynx
  - Usually squamous cell epitheliomas
- Clinical manifestations/assessment
  - Leukoplakia
  - Roughened area on the tongue
  - Difficulty chewing, swallowing, or speaking
  - Edema, numbness, or loss of feeling in the mouth
  - Earache, face ache, and toothache

Disorders of the Mouth

Carcinoma of the oral cavity (continued)
- Diagnostic tests
  - Indirect laryngoscopy
  - Excisional biopsy
- Medical management/nursing interventions
  - Stage I: Surgery or radiation
  - Stage II & III: Both surgery and radiation
  - Stage IV: Palliative
• Disorders of the Esophagus
  
• Gastroesophageal reflux disease
  ▪ Etiology/pathophysiology
    • Backward flow of stomach acid into the esophagus
  ▪ Clinical manifestations/assessment
    • Heartburn (pyrosis) 20 min to 2 hours after eating
    • Regurgitation
    • Dysphagia or odynophagia
    • Eructation

• Disorders of the Esophagus
  
• Gastroesophageal reflux disease (continued)
  ▪ Diagnostic tests
    • Esophageal motility and Bernstein tests
    • Barium swallow
    • Endoscopy
  ▪ Medical management/nursing interventions
    • Pharmacological management
      ▪ Antacids or acid-blocking medications
    • Dietary recommendations
    • Lifestyle recommendations
    • Comfort measures
    • Surgery

• Disorders of the Esophagus
  
• Carcinoma of the esophagus
  ▪ Etiology/pathophysiology
    • Malignant epithelial neoplasm that has invaded the esophagus
      ▪ 90% are squamous cell carcinoma associated with alcohol intake and tobacco use
6% are adenocarcinomas associated with reflux esophagitis

Clinical manifestations/assessment
- Progressive dysphagia over a 6-month period
- Sensation of food sticking in throat

Disorders of the Esophagus

Carcinoma of the esophagus (continued)

Medical management/nursing interventions
- Radiation: May be curative or palliative
- Surgery: May be palliative, increase longevity, or curative
  - Types of surgical procedures
    - Esophagogastronomy
    - Esophagogastrostomy
    - Esophagoenterostomy
    - Gastrostomy

Disorders of the Esophagus

Achalasia

Etiology/pathophysiology
- Cardiac sphincter of the stomach cannot relax
- Possible causes: Nerve degeneration, esophageal dilation, and hypertrophy

Clinical manifestations/assessment
- Dysphagia
- Regurgitation of food
- Substernal chest pain
- Loss of weight; weakness
- Poor skin turgor

Disorders of the Esophagus

Achalasia (continued)

Diagnostic tests
- Radiologic studies; esophagoscopy
- **Medical management/nursing interventions**
  - **Pharmacological management**
    - Anticholinergics, nitrates, and calcium channel blockers
  - Dilation of cardiac sphincter
  - Surgery
    - Cardiomyectomy

- **Disorders of the Stomach**

- **Acute gastritis**
  - **Etiology/pathophysiology**
    - Inflammation of the lining of the stomach
    - May be associated with alcoholism, smoking, and stressful physical problems
  - **Clinical manifestations/assessment**
    - Fever; headache
    - Epigastric pain; nausea and vomiting
    - Coating of the tongue
    - Loss of appetite

- **Disorders of the Stomach**

- **Acute gastritis (continued)**
  - **Diagnostic tests**
    - Stool for occult blood; WBC; electrolytes
  - **Medical management/nursing interventions**
    - Pharmacological management
      - Antiemetics
      - Antacids
      - Antibiotics
      - IV fluids
    - NG tube and administration of blood, if bleeding
    - NPO until signs and symptoms subside
    - Monitor intake and output
Disorders of the Stomach

Gastric ulcers and duodenal ulcers
- Ulcerations of the mucous membrane or deeper structures of the GI tract
- Most commonly occur in the stomach and duodenum
- Result of acid and pepsin imbalances
- H. pylori
  - Bacterium found in 70% of patients with gastric ulcers and 95% of patients with duodenal ulcers

Disorders of the Stomach

Gastric ulcers (continued)
- Etiology/pathophysiology
  - Gastric mucosa are damaged, acid is secreted, mucosal erosion occurs, and an ulcer develops

Duodenal ulcers (continued)
- Etiology/pathophysiology
  - Excessive production or release of gastrin, increased sensitivity to gastrin, or decreased ability to buffer the acid secretions

Disorders of the Stomach

Gastric and duodenal ulcers (continued)
- Clinical manifestations/assessment
  - Pain: Dull, burning, boring, or gnawing, epigastric
  - Dyspepsia
  - Hematemesis
  - Melena
- Diagnostic tests
  - Esophagastroduodenoscopy (EGD)
  - Breath test for H. pylori

Disorders of the Stomach
Gastric and duodenal ulcers (continued)

Medical management/nursing interventions

Pharmacological management

- Antacids
- Histamine H$_2$ receptor blockers
- Proton pump inhibitor
- Mucosal healing agents
- Antibiotics

Dietary recommendations

- High in fat and carbohydrates; low in protein and milk products; small frequent meals; limit coffee, tobacco, alcohol, and aspirin use

Disorders of the Stomach

Gastric and duodenal ulcers (continued)

Medical management/nursing interventions

Surgery

- Antrectomy
- Gastroduodenostomy (Billroth I)
- Gastrojejunostomy (Billroth II)
- Total gastrectomy
- Vagotomy
- Pyloroplasty

Disorders of the Stomach

Gastric and duodenal ulcers (continued)

Complications after gastric surgery

- Dumping syndrome
- Pernicious anemia
- Iron deficiency anemia

Disorders of the Stomach

Cancer of the stomach

Etiology/pathophysiology

- Most commonly adenocarcinoma
• Primary location is the pyloric area

• Risk factors:
  - History of polyps
  - Pernicious anemia
  - Hypochlorhydria
  - Gastrectomy; chronic gastritis; gastric ulcer
  - Diet high in salt, preservatives, and carbohydrates
  - Diet low in fresh fruits and vegetables

Disorders of the Stomach

Cancer of the stomach (continued)
  - Clinical manifestations/assessment
    - Early stages may be asymptomatic
    - Vague epigastric discomfort or indigestion
    - Postprandial fullness
    - Ulcer-like pain that does not respond to therapy
    - Anorexia; weight loss
    - Weakness
    - Blood in stools; hematemesis
    - Vomiting after fluids and meals

Disorders of the Stomach

Cancer of the stomach (continued)
  - Diagnostic tests
    - GI series
    - Endoscopic/gastroscopic examination
    - Stool for occult blood
    - RBC, hemoglobin, and hematocrit
  - Medical management/nursing interventions
    - Surgery
      - Partial or total gastric resection
Chemotherapy and/or radiation

Disorders of the Intestines

Infection

- Etiology/pathophysiology
  - Invasion of the alimentary canal by pathogenic microorganisms
  - Most commonly enters through the mouth in food or water
  - Person-to-person contact
  - Fecal-oral transmission
  - Long-term antibiotic therapy can cause an overgrowth of the normal intestinal flora (C. difficile)

Disorders of the Intestines

Infection (continued)

- Clinical manifestations/assessment
  - Diarrhea
  - Rectal urgency
  - Tenesmus
  - Nausea and vomiting
  - Abdominal cramping
  - Fever

Disorders of the Intestines

Infection (continued)

- Diagnostic tests
  - Stool culture
- Medical management/nursing interventions
  - Antibiotics
  - Fluid and electrolyte replacement
  - Kaopectate
• Pepto-Bismol

Disorders of the Intestines

Irritable bowel syndrome

- Etiology/pathophysiology
  - Episodes of alteration in bowel function
  - Spastic and uncoordinated muscle contractions of the colon

- Clinical manifestations/assessment
  - Abdominal pain
  - Frequent bowel movements
  - Sense of incomplete evacuation
  - Flatulence, constipation, and/or diarrhea

Disorders of the Intestines

Irritable bowel syndrome (continued)

- Diagnostic tests
  - History and physical examination

- Medical management/nursing interventions
  - Pharmacological management
    - Anticholinergics
    - Milk of magnesia
    - Mineral oil
    - Opioids
    - Antianxiety agents
  - Dietary recommendations
  - Bulking agents

Disorders of the Intestines

Ulcerative colitis

- Etiology/pathophysiology
  - Ulceration of the mucosa and submucosa of the colon
Tiny abscesses form that produce purulent drainage, slough the mucosa, and ulcerations occur.

Clinical manifestations/assessment
- Diarrhea—pus and blood; 15 to 20 stools per day
- Abdominal cramping
- Involuntary leakage of stool

Disorders of the Intestines

Ulcerative colitis (continued)
- Diagnostic tests
  - Barium studies, colonoscopy, stool for occult blood
- Medical management/nursing interventions
  - Pharmacological management
    - Azulfidine, Dipentum, Rowasa, corticosteroids, Imodium
  - Dietary recommendations: No milk products or spicy foods; high-protein, high-calorie; total parenteral nutrition
  - Stress control
  - Assist patient to find coping mechanisms

Medical management/nursing interventions
- Surgical interventions
  - Colon resection
  - Ileostomy
  - Ileoanal anastomosis
  - Proctocolectomy
  - Kock pouch

Disorders of the Intestines

Crohn’s disease
- Etiology/pathophysiology
  - Inflammation, fibrosis, scarring, and thickening of the bowel wall
Clinical manifestations/assessment

- Weakness; loss of appetite
- Diarrhea: 3 to 4 daily; contain mucus and pus
- Right lower abdominal pain
- Steatorrhea
- Anal fissures and/or fistulas

Disorders of the Intestines

Crohn’s disease (continued)

Medical management/nursing interventions

- Pharmacological management
  - Corticosteroids
  - Azulfidine
  - Antibiotics
  - Antidiarrheals; antispasmodics
  - Enteric-coated fish oil capsules
  - B₁₂ replacement

Disorders of the Intestines

Crohn’s disease (continued)

Medical management/nursing interventions

- Dietary recommendations
  - High-protein
  - Elemental
  - Hyperalimentation
  - Avoid
    - Lactose-containing foods, brassica vegetables, caffeine, beer, monosodium glutamate, highly seasoned foods, carbonated beverages, fatty foods

- Surgery
  - Segmental resection of diseased bowel

Disorders of the Intestines

Appendicitis

- Etiology/pathophysiology
- Inflammation of the vermiform appendix
- Lumen of the appendix becomes obstructed, the *E. coli* multiplies, and an infection develops

Clinical manifestations/assessment
- Rebound tenderness over the right lower quadrant of the abdomen (McBurney’s point)
- Vomiting
- Low-grade fever
- Elevated WBC

Disorders of the Intestines

Appendicitis *(continued)*
- Diagnostic tests
  - WBC
  - Roentgenogram
  - Ultrasound
  - Laparoscopy
- Medical management/nursing interventions
  - Appendectomy

Disorders of the Intestines

Diverticular disease
- Etiology/pathophysiology
  - Diverticulosis
    - Pouch-like herniations through the muscular layer of the colon
  - Diverticulitis
    - Inflammation of one or more diverticula

Disorders of the Intestines

Diverticular disease *(continued)*
- Clinical manifestations/assessment
- Diverticulosis
  - May have few, if any, symptoms
  - Constipation, diarrhea, and/or flatulence
  - Pain in the left lower quadrant

- Diverticulitis
  - Mild to severe pain in the left lower quadrant
  - Elevated WBC; low-grade fever
  - Abdominal distention
  - Vomiting
  - Blood in stool

• Disorders of the Intestines

- Diverticular disease (continued)
  - Medical management/nursing interventions
    - Diverticulosis with muscular atrophy
      - Low-residue diet; stool softeners
      - Bed rest
    - Diverticulosis with increased intracolonic pressure and muscle thickening
      - High-fiber diet
      - Sulfa drugs
      - Antibiotics; analgesics

• Disorders of the Intestines

- Diverticular disease (continued)
  - Medical management/nursing interventions (continued)
    - Surgery
      - Hartmann’s pouch
      - Double-barrel transverse colostomy
      - Transverse loop colostomy

• Disorders of the Intestines

- Peritonitis
  - Etiology/pathophysiology
    - Inflammation of the abdominal peritoneum
    - Bacterial contamination of the peritoneal cavity from fecal matter or chemical irritation
Clinical manifestations/assessment

- Severe abdominal pain; nausea and vomiting
- Abdomen is tympanic; absence of bowel sounds
- Chills; weakness
- Weak rapid pulse; fever; hypotension

Disorders of the Intestines

Peritonitis (continued)

- Diagnostic tests
  - Flat plate of the abdomen
  - CBE
- Medical management/nursing interventions
  - Pharmacological management
    - Parenteral antibiotics
    - Analgesics
    - IV fluids
  - Position patient in semi-Fowler’s position
  - Surgery
    - Repair cause of fecal contamination
    - Removal of chemical irritant
  - NG tube to prevent GI distention

Disorders of the Intestines

External hernias

- Etiology/pathophysiology
  - Congenital or acquired weakness of the abdominal wall or postoperative defect
    - Abdominal
    - Femoral or inguinal
    - Umbilical

Disorders of the Intestines

External hernias (continued)
Clinical manifestations/assessment

- Protruding mass or bulge around the umbilicus, in the inguinal area, or near an incision
- Incarceration
- Strangulation

Diagnostic tests

- Radiographs
- Palpation

Disorders of the Intestines

External hernias (continued)

Medical management/nursing interventions

- If no discomfort, hernia is left unrepaired, unless it becomes strangulated or obstruction occurs
- Truss
- Surgery
  - Synthetic mesh is applied to weakened area of the abdominal wall

Disorders of the Intestines

Hiatal hernia

Etiology/pathophysiology

- Protrusion of the stomach and other abdominal viscera through an opening in the membrane or tissue of the diaphragm
- Contributing factors: obesity, trauma, aging

Clinical manifestations/assessment

- Most people display few, if any, symptoms
- Gastroesophageal reflux

Disorders of the Intestines

Hiatal hernia (continued)

Medical management/nursing interventions

- Head of bed should be slightly elevated when lying down
• Surgery
  ▪ Posterior gastropexy
  ▪ Transabdominal fundoplication (Nissen)

• Disorders of the Intestines

• Intestinal obstruction
  ▪ Etiology/pathophysiology
    ▪ Intestinal contents cannot pass through the GI tract
    ▪ Partial or complete
    ▪ Mechanical
    ▪ Non-mechanical
  ▪ Clinical manifestations/assessment
    ▪ Vomiting; dehydration
    ▪ Abdominal tenderness and distention
    ▪ Constipation

• Disorders of the Intestines

• Intestinal obstruction (continued)
  ▪ Diagnostic tests
    ▪ Radiographic examinations
    ▪ BUN, sodium, potassium, hemoglobin, and hematocrit
  ▪ Medical management/nursing interventions
    ▪ Evacuation of intestine
      ▪ NG tube to decompress the bowel
      ▪ Nasointestinal tube with mercury weight
    ▪ Surgery
      ▪ Required for mechanical obstructions

• Disorders of the Intestines

• Colorectal cancer
  ▪ Etiology/pathophysiology
• Malignant neoplasm that invades the epithelium and surrounding tissue of the colon and rectum
• Second most prevalent internal cancer in the United States

Clinical manifestations/assessment
• Change in bowel habits; rectal bleeding
• Abdominal pain, distention, and/or ascites
• Nausea
• Cachexia

Disorders of the Intestines

Cancer of the colon (continued)

Diagnostic tests
• Proctosigmoidoscopy with biopsy
• Colonoscopy
• Stool for occult blood

Medical management/nursing interventions
• Radiation
• Chemotherapy

Disorders of the Intestines

Cancer of the colon (continued)

Medical management/nursing interventions (continued)

Surgery
• Obstruction
  o One-stage or two-stage resection
  o Two-stage resection
• Colorectal cancer
  o Right or left hemicolecotomy
  o Anterior rectosigmoid resection

Disorders of the Intestines

Hemorrhoids
Etiology/pathophysiology

- Varicosities (dilated veins)
  - External or internal
- Contributing factors
  - Straining with defecation, diarrhea, pregnancy, CHF, portal hypertension, prolonged sitting and standing

Clinical manifestations/assessment

- Varicosities in rectal area
- Bright red bleeding with defecation
- Pruritus
- Severe pain when thrombosed

Disorders of the Intestines

Hemorrhoids (continued)

- Medical management/nursing interventions
  - Pharmacological management
    - Bulk stool softeners
    - Hydrocortisone cream
    - Topical analgesics
  - Sitz baths
  - Ligation
  - Sclerotherapy; cryotherapy
  - Infrared photocoagulation
  - Laser excision
  - Hemorrhoidectomy

Disorders of the Intestines

Anal fissure

- Linear ulceration or laceration of the skin of the anus
- Usually caused by trauma
- Lesions usually heal spontaneously
- May be excised surgically
• Anal fistula
  ▪ Abnormal opening on the surface near the anus
  ▪ Usually from a local abscess
  ▪ Common in Crohn’s disease
  ▪ Treated by a fistulectomy or fistulotomy

• Nursing Process

• Nursing diagnoses

• Disorders of the Intestines

• Fecal incontinence
  ▪ Potential causes
  ▪ Medical management/nursing interventions
    ▪ Biofeedback training
    ▪ Bowel training
    ▪ Patient education
    ▪ Dietary recommendations