Chapter 28
Medical Nutrition Therapy for Upper Gastrointestinal Tract Disorders
Digestive Disorders

- Common problem; more than 50 million outpatient visits per year
- Dietary habits and nutrition play key roles in prevention and treatment of diseases of the gastrointestinal tract (GIT)
- Medical nutrition therapy is necessary to prevent and treat malnutrition associated with the diseases of the GIT
Assessment Parameters

- Screening: most important indicator is unintentional weight loss
- Diet history: changes in appetite, nausea, vomiting, diarrhea, chewing and swallowing problems, food intolerances, typical intake
- Laboratory parameters: vitamin B12, folate, ferritin, 25-hydroxy vitamin D
Normal Esophagus

- Food takes 5 seconds to reach stomach; up to 30s if supine
- Achlasia: Loss of ability to relax LES and perform normal peristalsis d/t failure of neurons
- Odynophasia: Painful swallowing
Disorders of the Esophagus

Gastroesophageal reflux disease (GERD)
- Backward flow of the stomach, duodenal contents, or both into the esophagus
- Burning sensation after meals; heartburn
- Competency of the lower esophageal sphincter (LES) is compromised
- Possible discomfort during and after eating
- 7%-8% of population heartburn daily, 20-40% weekly
Esophagitis

- Inflammation, ulceration, erosions, scarring
- Acute from reflux, ingestion of a corrosive agent, infection, intubation, radiation
- Chronic from prolonged contact with gastric acid or other irritant (e.g., NSAIDs)
- Barrett’s Esophagus results in 5% to 15%
Barrett’s Esophagus (BE)

- Precancerous condition - normal squamous epithelium is replaced with abnormal columnar epithelial cells.
- Risk factors include prolonged GERD, male gender, age older than 50 years, family history
- Increasing incidence
Hiatal Hernia

- An outpouching of a portion of the stomach into the chest cavity through the esophageal hiatus of the diaphragm
- Epigastric discomfort after large, energy-dense meals
- Medical nutrition therapy: weight reduction, decreasing meal size
- May require surgery
Nutritional Care Guidelines for Patients with Reflux and Esophagitis

- Avoid large, high-fat meals.
- Avoid eating at least 3 to 4 hours before retiring.
- Avoid smoking.
- Avoid alcoholic beverages.
- Avoid caffeine-containing foods and beverages.
- Stay upright and avoid vigorous activity soon after eating.
- Avoid tight-fitting clothing, especially after a meal.
- Consume a healthy, nutritionally complete diet with adequate fiber.
- Avoid acidic and highly spiced foods when inflammation exists.
- Lose weight if overweight.
- Small meals
Disorders of the Stomach

- Indigestion or dyspepsia
- Nonspecific persistent upper abdominal pain
- Epigastric discomfort after meals
- Due to reflux, gastritis, peptic ulcer, gallbladder ds; may also occur along with GERD, IBS or depression
- Symptoms: abdominal pain, bloating, early satiety, nausea, and belching
- Tx: reduce dietary fat intake, use smaller meals, eat meals with low caloric density, limit alcohol
Gastritis

- Mucosal integrity is compromised
- **Helicobacter pylori**- infection and inflammation
  - Atrophic gastritis- chronic inflammation with deterioration of the mucous membrane and glands- resulting in achlorhydria and loss of intrinsic factor
- Chronic used of aspirin and NSAIDS, steroids, alcohol, tobacco can also cause gastritis
- Acute gastritis: rapid onset of inflammation and symptoms
- Chronic gastritis: occurs over period of time
- Symptoms: nausea, vomiting, malaise, anorexia, hemorrhage, and epigastric pain
Peptic Ulcer Disease

- Primary causes: H. pylori infection, gastritis, use of NSAIDs, corticosteroids, and so-called stress ulcers
- Gastric ulcer formation involves widespread gastritis, inflammation of oxyntic cells (parietal), and atrophy of acid- and pepsin-producing cells
- Can involve gastric and/or duodenal regions
Peptic Ulcer Disease

- Gastric ulcers: in stomach; normal or low acid secretion - most likely to occur in lesser curvature - hemorrhage and mortality higher than with duodenal ulcer
  - Gastric ulcer formation involves widespread gastritis, and atrophy of acid- and pepsin-producing cells.

- Duodenal ulcers: in duodenum; associated with high acid secretion and decrease bicarb secretion - usually occurs in first few centimeters of duodenum.
Management of Peptic Ulcers

- Antibiotics
- Acid suppression
- Surgery
Medical Nutrition Therapy for Peptic Ulcers

- Protein foods temporarily buffer gastric secretions but also stimulate gastrin, acid, and pepsin
- Moderate alcohol intake
- Usually not necessary to limit acidic foods; most foods are much less acidic than normal gastric pH of 1 to 3
- Chili, cayenne, and black pepper and caffeine may increase acid secretion
- Overall good diet; frequent small meals
- Milk does not “coat” the stomach
Dumping Syndrome

- Complex physiologic response to the rapid emptying of hypertonic contents into the duodenum and jejunum.
- Dumping syndrome occurs as a result of total or subtotal gastrectomy.
- Symptoms: abdominal fullness, nausea, flushing, rapid heartbeat, faintness, sweating, flatulence, abdominal cramps, diarrhea.
- Often causes weight loss.
# Nutritional Care Guidelines for Patients with Dumping Syndrome

1. Small meals spread throughout the day are likely to result in improved net absorption and less dramatic fluid shifts.

2. High-protein, moderate-fat foods are recommended, with sufficient calories for weight maintenance or gain as needed. Complex carbohydrates are included as tolerated.

3. Intake of fibrous foods slows upper GI transit and increases viscosity. However, to avoid obstruction, caution should be used with large particles and fiber supplements, especially with esophageal or gastric outlet narrowing or dysmotility.

4. Lying down and avoiding activity an hour after eating may help slow gastric emptying.

5. Taking large amounts of liquids with meals is thought to hasten GI transit, but adequate amounts of liquid should be consumed throughout the day, small amounts at a time.

6. Only very small quantities of hypertonic, concentrated sweets should be ingested. These include soft drinks, juices, pies, cakes, cookies, and frozen desserts (unless made with sugar substitutes).

7. Lactose, especially in milk or ice cream, may be poorly tolerated because of rapid transit and thus may need to be avoided. Cheeses and yogurt are likely to be better tolerated.
Chapter 29
Medical Nutrition Therapy for Lower Gastrointestinal Tract Disorders
Common Intestinal Problems

- Intestinal gas and flatulence
- Constipation
- Diarrhea
  - Steatorrhea
- IBD/IBS
- Gastrointestinal strictures and obstruction
Intestinal Gas and Flatulence

- Air that is swallowed (aerophagia) and other gases are produced in the gastrointestinal tract (GIT) by digestive processes and bacteria.
- Intestinal gases: nitrogen, oxygen, carbon dioxide, hydrogen, and sometimes methane.
- Gas is passed by belching or flatus.
- Gas production occurs in the stomach and small intestine from bacterial fermentation of carbohydrates and can result in abdominal distension and discomfort.
Recommendations to Decrease Gas

- Eat slowly chew with the mouth closed
- Avoid chewing gum; avoid using straws
- Avoid high-fat meals
- Upright position during and after meals; do not remain sedentary if possible
- May need to limit lactose, sugar alcohols, and high-fructose corn syrup
Causes of Constipation: Systemic

- Side effect of medication (50-80% of patients on opioids)
- Metabolic endocrine abnormalities, such as hypothyroidism
- Some illnesses
- Lack of exercise
- Ignoring the urge to defecate
- Vascular disease of the large bowel
- Systemic neuromuscular disease leading to deficiency of voluntary muscles
- Poor diet low in fiber
- Pregnancy

Normal BM:
- 100-200g daily
- once/day to every three days normal
- Normal transit time is 18-48 hours
Causes of Constipation:
Gastrointestinal

- Cancer
- Diseases of the upper GIT
- Diseases of the large bowel resulting in
  - Failure of propulsion along the colon (colonic inertia)
  - Failure of passage through anorectal structures (outlet obstruction)
- Irritable bowel syndrome
- Laxative abuse
Medical Nutrition Therapy for Constipation

- Address reason for constipation!!
- Then ensure,
  - Adequate soluble and insoluble dietary fiber
  - Recommended intake is 14 g per 1000 kcal
  - About 25 g for women, 38 g for men, and 19 to 25 g for children
  - Fiber increases colonic fecal fluid, microbial mass (which accounts for 60-70% of stool weight), stool weight frequency and rate of transit
  - Fiber may help soften stools and make them easier to pass
  - Supplements may be helpful
Diarrhea

- Defined as frequent evacuation of liquid stools usually exceeding 300mL leading to an excessive loss of fluid, Na and K

1. Osmotic – osmotically active solutes are poorly absorbed (e.g. dumping syndrome and lactose intolerance)
2. Secretory due to infection- not resolved with fasting like osmotic
3. Medication induced
4. Malabsorptive- one or more nutrients is not digested and absorbed so large amount in stool steratorrha= fatty diarrhea

- Antibiotic-associated diarrhea- opportunistic infection
**Clostridium difficile**

- Leading cause of nosocomial (hospital acquired) diarrhea in the United States
- Opportunistic proliferation of pathogenic organisms associated with antibiotic therapy
- Causes colitis, secretory diarrhea, severe dilation of the colon, and even death
- Spore forming and can be spread
- Diagnosed by stool sample
- Treatment with probiotics so far inconclusive
Medical Nutrition Therapy for Diarrhea

- Identify and treat underlying problem
- Replace fluid and electrolytes; oral glucose electrolyte solutions with potassium, soups and broths, vegetable juices, and other isotonic liquids
- Introduce starchy CHO's, low-fat meats, and small amounts of vegetables and fruits followed by lipids
- No evidence BRAT is beneficial
- Avoid sugar alcohols, lactose, fructose
- Prebiotics and probiotics
Celiac Disease: Gluten-Sensitive Enteropathy

- Autoimmune reaction to gluten - a protein fraction found in wheat, barely and rye
- Intestinal mucosa damaged
- Malabsorption of nutrients
- Iron deficiency
- Osteomalacia
- Growth failure
- Projectile vomiting
Celiac Disease: Gluten-Sensitive Enteropathy

- Trigger of disease not known
- Affects proximal and middle sections of the SI—though can occur distally
- Affects 1:133
- Most often in women, diagnosed most frequently between 40-60 years

Assessment

- Patterns
- Family hx
- Biopsy of SI is gold standard—NO gluten-free diet s/p biopsy
Normal Human Duodenal Mucosa (A) and Peroral Small Bowel Biopsy Specimen (B) from a Patient with Gluten Enteropathy
Medical Nutrition Therapy for Celiac Disease

- Omit sources of gluten: wheat, rye, barley
- Label reading is critical
- Use uncontaminated corn, potato, rice, soybean, tapioca, arrowroot, amaranth, quinoa, millet, and buckwheat
- Oats are questionable
- Cross-contamination must be considered
Inflammatory Bowel Disease

- Crohn’s disease or ulcerative colitis
- Both cause diarrhea, fever, weight loss, anemia, food intolerances, malnutrition, growth failure, and extraintestinal manifestations (arthritic, dermatologic, and hepatic); associated with malignancy
Inflammatory Bowel Disease

Crohn’s disease:
- may involve any part of the GI
- Most in distal ileum and colon; segments of inflamed bowel; transmural

Ulcerative colitis
- Mucosal disease of the large intestine, including the rectum
- Continuous sections
Medical Nutrition Therapy for Inflammatory Bowel Disease

- Fears and misconceptions; individualize
- Nutrition support with parenteral or enteral nutrition to bring clinical remission
- “Complete bowel rest” using PN not necessarily required
- Enteral nutrition may temper inflammatory process and be steroid sparing and is preferred over PN
- Children benefit from enteral nutrition to maintain growth and reduce steroid dependence
- Vitamins, folate, vitamin B6, and vitamin B12 may require supplementation
Disorders of the Large Intestine

1. Irritable bowel syndrome
   - Common syndrome involving abdominal discomfort and altered intestinal motility, bloating, feelings of incomplete evacuation, mucus in stool, straining or increased urgency, GI distress with psychosocial distress
   - Ensure adequate nutrient intake, tailor diet for specific pattern of IBS, management of symptoms, adequate fiber, prebiotics

2. Diverticular disease
   - Herniations of the colon, chronic diverticulosis, acute diverticulitis
   - Diverticulosis: high-fiber diet, increase gradually, supplements if necessary, adequate fluid intake
   - Diverticulitis: low-residue, possible PN, then gradual return to high fiber diet
Disorders of the Large Intestine (cont’d)

3. Intestinal polyps and colon cancer

- Colorectal cancer is the third most common cancer among U.S. adults
- Polyps are considered precursors of colon cancer
- Recommend sufficient exercise, weight maintenance or reduction, modest and balanced intake of lipids, adequate micronutrients, and limited alcohol
Short Bowel Syndrome (SBS)

- Loss of 70% to 75% of the small bowel usually results in SBS:
  - 100 to 120 cm of small bowel without a colon
  - 50 cm of small bowel with the colon intact
- Causes weight loss; diarrhea; decreased transit time; malabsorption; dehydration; loss of electrolytes; hypokalemia
- Removal of ileocecal valve causes more complications
- Fat malabsorption frequent
  - Steatorrhea
- Supplement calcium, zinc, and magnesium
- Remove ileum and likely lose vitamin B12 and bile salt absorption
Factors affecting the severity of malabsorption, number of complications, and dependence on parenteral nutrition:

- Length of remaining small intestine
- Loss of ileum, especially distal third
- Loss of ileocecal valve
- Loss of colon
- Disease in remaining segments(s) of the GIT
- Coexisting malnutrition
- Older age
- Surgery
Short Bowel Syndrome: Nutritional Care

Step 1
- Parenteral only for most patients

Step 2
- Gradually introduce enteral nutrition; start early
- Continuing care
  - Narcotic drugs for pain cause GI problems and should be evaluated
  - Eventually, the remaining bowel increases its absorptive surface, and problems decrease; adaptation takes up to 1 year
  - Nutrition support is designed to meet each patient’s needs
  - Intestinal transplant
Ileostomy or Colostomy: Surgical Opening of Intestine to Outside

- Causes: ulcerative colitis, Crohn’s disease, colon cancer, trauma

Treatment
- Nutrition needs vary with location and individual
- Avoid gas- and odor-forming foods
- Fluid and electrolyte needs
- Vitamin B12 if loss of terminal ileum