Medical Nutrition Therapy for Upper Gastrointestinal Tract Disorders

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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 $B_{12}$, folate, ferritin, 25-hydroxy vitamin D
Normal Esophagus
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)
  - Possible discomfort during and after eating; change in eating habits, especially in the evening
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

- Precancerous condition

- Risk factors include prolonged GERD, male gender, age older than 50 years, family history

- Increasing incidence
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.
Esophagitis

Pathophysiology and Care Management Algorithm

**Etiology**

- Viral infection
- Ingestion of irritating agents
- Intubation
- Increased abdominal pressure
- Reduced LES pressure
- Recurrent vomiting
- Hiatal hernia
- Delayed gastric emptying

**Pathophysiology**

- Reflux of gastric acid and/or intestinal contents through the lower esophageal sphincter (LES) and into the esophagus

**Behavioral Modification**

**Avoid:**
- Eating within 3-4 hours of retiring
- Lying down after meals
- Tight-fitting garments
- Cigarette smoking

**Nutrition Management**

**Goal:** Decrease exposure of esophagus to gastric contents

**Avoid:**
- Large meals
- Dietary fat
- Alcohol

**Goal:** Decrease acidity of gastric secretions

**Avoid:**
- Coffee
- Fermented alcoholic beverages

**Goal:** Prevent pain and irritation

**Avoid:**
- Any food that the patient feels exacerbates his/her symptoms

**Medical/Surgical Management**

- Proton pump inhibitors
- Histamine-2 receptor antagonists
- Antacids
- Prokinetic agents
- Fundoplication
Disorders of the Esophagus (cont’d)

Hiatal hernia

- An outpouching of a portion of the stomach into the chest 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
Hiatal Hernia
Disorders of the Esophagus (cont’d)

Cancer and surgery of the mouth or esophagus

- Existing nutritional problems and eating difficulties caused by the tumor mass, obstruction, oral infection, and ulceration
- Chewing, swallowing, salivation, and taste acuity are often affected
- Weight loss is common
Disorders of the Stomach

Indigestion or dyspepsia

- Epigastric discomfort after meals
- Abdominal pain, bloating, early satiety, nausea, and belching
- Reduce dietary fat intake, use smaller meals, eat meals with low caloric density, limit alcohol
Disorders of the Stomach (cont’d)

Gastritis

- *Helicobacter pylori*
- Infection and inflammation
- Acute gastritis: rapid onset of inflammation and symptoms
- Chronic gastritis: occurs over period of time
- Symptoms: nausea, vomiting, malaise, anorexia, hemorrhage, and epigastric pain
Disorders of the Stomach (cont’d)

Peptic ulcer disease

- Primary causes: *H. pylori* infection, gastritis, use of NSAIDs, corticosteroids, and so-called stress ulcers
- Involves gastric and duodenal regions
- Gastric ulcers: in stomach; normal or low acid secretion
- Duodenal ulcers: in duodenum; high acid secretion
Characteristics and Comparisons Between Gastric and Duodenal Ulcers

- Gastric ulcer formation involves widespread gastritis, inflammation of oxyntic cells, and atrophy of acid- and pepsin-producing cells.
- Duodenal ulcers are associated with high acid and low bicarbonate secretion.
- Hemorrhage and increased mortality are associated with gastric ulcers.
Gastric and Duodenal Ulcers
Management of Peptic Ulcers

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

- Protein foods buffer gastric secretions by 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
Peptic Ulcer

H. pylori infection
Stress
Aspirin and other NSAIDs
Gastritis

Erosion through muscularis mucosa into submucosa or muscularis propria

Medical Management
- If H. pylori positive, use antibiotics
- Reduce or withdraw use of NSAIDs
- Use sucralfate, antacids
- Suppress acid secretion with proton pump inhibitors or H₂-receptor antagonists

Behavioral Management
- Avoid tobacco products

Nutrition Management
Decrease consumption of:
- Alcohol
- Spices, particularly red and black peppers when inflamed
- Coffee and caffeine
Increase consumption of:
- ω-3 and ω-6 fatty acids, which may have a protective effect

Good nutrition helps defend against H. pylori complications
Stress Ulcers

- Complication of severe burns, trauma, surgery, shock, radiation therapy, or renal failure
- Gastric ischemia, hypoperfusion, oxidative injury, reflux of bile acids or pancreatic enzymes, microbial colonization, and mucosal barrier changes are implicated
- Significant cause of morbidity in critically ill patients
- Use of antioxidant compounds show promise
Factors That Affect Gastric Acidity

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<thead>
<tr>
<th>Increase Gastric Acidity</th>
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<tbody>
<tr>
<td><strong>Cephalic Phase of Digestion</strong></td>
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<tr>
<td>Thought, taste, smell of food, and chewing and swallowing initiate vagal stimulation of the parietal cells in the fundic mucosa, resulting in secretion of gastric acid.</td>
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<tr>
<th>Gastric Phase of Digestion</th>
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<tr>
<td>Effect of food in the stomach:</td>
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<tr>
<td>• Distension of the fundus stimulates the parietal cells to produce acid.</td>
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<tr>
<td>• Increased alkalinity of antrum causes the release of gastrin, which stimulates gastric acid secretion.</td>
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<tr>
<td>• Distension of the antrum causes release of gastrin.</td>
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<tr>
<td>• Substances in certain foods and digestive products increase acidity (e.g., coffee, both with or without caffeine; alcohol; polypeptides and amino acids [products of protein digestion]).</td>
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<td><strong>Gastric Phase of Digestion</strong></td>
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<td>Acidification of the antrum reduces gastrin release and thus gastric acid secretion.</td>
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<td>Food, especially protein, has an initial buffering effect.</td>
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<th>Intestinal Phase of Digestion</th>
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<td>Fat, acid, and protein in the small intestine stimulate release of one or more GI hormones that inhibit gastric acid secretion.</td>
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Carcinoma of the Stomach

- Obstruction and mechanical interference
- Surgical resection or gastrectomy
- Prevention of GI cancers: fruits, vegetables, and selenium
- Increase risk of GI cancers: alcohol, overweight, high salted or pickled foods, inadequate micronutrients
Gastric Surgical Procedures

- **Billroth I gastroduodenostomy**
  - Less dumping than with Billroth II.

- **Billroth II gastrojejunostomy**
  - Sequelae, such as steatorrhea, weight loss, dumping, vomiting, and bacterial overgrowth, occur more often with the Billroth II procedure than with Billroth I.

- **Partial gastric resection**
  - Small pouch

- **Vagotomy**
  - Depending on the extent of the vagotomy, HCl secretion is reduced, and gastric emptying is slowed. Dumping syndrome often follows this surgery.

- **Pyloroplasty**
  - Duodenal reflux often follows this surgery.

- **Roux-en-Y procedure**
  - Stomach
  - Jejunum

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, alimentary hypoglycemia
- Often causes weight loss
Nutritional Care Guidelines for Patients with Dumping Syndrome and Alimentary Hypoglycemia

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.
Gastroparesis

- Delayed gastric emptying
- Complex condition associated with chemical and neurological factors
- Causes include diabetes, surgery, smooth muscle disorders, neuropathic disorders, psychological disorders, and obstruction
- 30% are idiopathic
Common Medications Used to Treat Disorders of the GIT

- Antibiotics: eradicate *H. pylori*, prevent or treat infection after abdominal wounds or surgery
- Antacids: neutralize gastric acid in acid reflux, peptic ulcer
- Proton pump inhibitors (omeprazole, lansoprazole): decrease gastric acid secretion
- Histamine-2 receptor antagonists (cimetidine, ranitidine): inhibit gastric acid secretion
Common Medications Used to Treat Disorders of the GIT (cont’d)

- Sucralfate (sulfated disaccharide): protects stomach lining and may increase mucosal resistance to acid or enzyme damage
- Metoclopramide or erythromycin to stimulate gastric emptying for gastroparesis