

Clinical Module 1 – Gastrointestinal Disorders

Module 1 Questions:

I. Definitions:

Endoscopy

- a procedure where a doctor uses an instrument called an endoscope to look inside an organ.

Steatorrhea

- fat in feces

Bacterial translocation

- the passage of viable bacteria from the GI tract to extra intestinal sites such as the mesenteric lymph node complex, liver, spleen, kidney, and bloodstream.

Ileus

- lack of movement in the intestines that leads to a buildup and potential blockage of food material which can lead to an intestinal obstruction.

II. Pathophysiology:

A. What laboratory values would most likely be changed in a patient with dehydration due to severe diarrhea?

The following lab values will be **increased**: Albumin, BUN, creatinine, hematocrit, & osmolality

The following lab values will be **decreased**: Na⁺, K⁺, bicarbonate

B. For each of the following disorders, describe the etiology, clinical symptoms, medical management, and diet therapy:

Hiatal hernia

Etiology:

- o Caused by the protrusion of part of the stomach through the diaphragm muscle.

Clinical Symptoms:

- o Heartburn, swallowing difficulty, reflux, shortness of breath, or vomiting.

Medical Management:

- o Medications – antacids (Mylanta, Tums, and Rolaids), H-2-receptor blockers (Pepcid, Axid, and Zantac), proton pump inhibitors (Prevacid, Prilosec)

- Surgery – creating a smaller opening in the diaphragm or removing the hernia sac

Diet Therapy:

- Diet should be reflective of patient's needs
- Small frequent feedings of soft foods when there are acute episodes
- High protein diet stimulate gastrin secretion and increase lower esophageal sphincter pressure. Chocolate, peppermint, onions, garlic, and spearmint should be avoided.
- Consume foods that are lower in fat. Consume more fruits and vegetables.
- Consume fluids in between meals

Gastroesophageal reflux disease (GERD)

Etiology:

- Weakened lower esophageal sphincter (LES) which causes the contents of the stomach to go back up to the esophagus.

Clinical Symptoms:

- Common symptoms: regular heartburn, painful/burning feeling in the middle of chest, behind the breastbone, and in the middle of the abdomen.
- Other symptoms: bad breath, nausea, painful swallowing, vomiting, wearing away of teeth.

Medical Management:

- Over-the-counter acid suppression medication, promotility therapy, or anti-reflux surgery. Intractable GERD may require minor surgery. Obese patients with severe GERD may require bariatric surgery to relieve heartburn.

Diet Therapy:

- Reduced-energy diet for weight loss for those patients who need it
- Eat small frequent meals.
- High protein diet stimulate gastrin secretion and increase lower esophageal sphincter pressure. Chocolate, peppermint, onions, garlic, and spearmint should be avoided.
- Avoid caffeine, citrus fruits/juices, carbonated beverages, alcohol, tomato products, spicy foods, and garlic and onions.
- Consume a diet lower in fat
- Do not lay down after meals.

Diabetic gastroparesis

Etiology:

- Vagus nerve is damaged or stops working which affects the muscles of the stomach and intestines. These muscles stop working and the movement of food is either slowed or stopped which is also referred to as delayed gastric emptying.

Clinical Symptoms:

- Heartburn, nausea, vomiting of undigested food, early satiety, weight loss, abdominal bloating, erratic sugar levels, lack of appetite, gastroesophageal reflux, spasms of the stomach wall

Medical Management:

- Manage blood glucose levels by taking insulin or oral medications.
- Correct dehydration and electrolyte abnormalities.
- Reduce or control pain, diarrhea, or bouts of constipation.

Diet Therapy:

- Soft-to-liquid diet low in fat since isotonic liquids empty more quickly than hypertonic liquids.
- Six small meals. Sit upright while eating.
- Eat more fiber to ease diarrhea. Less fiber for those with a history of bezoar formation.
- For those with lesser obstruction, move to a mechanical soft diet.
- For those with greater obstruction, recommend a low-fiber diet or tube feeding. Check residuals.
- Parenteral nutrition via j-tube for those with inadequate oral intake.

Crohn's disease

Etiology:

- Cause is unknown. It is an inflammatory bowel disease that causes inflammation and irritation of the digestive tract (mouth to anus)

Clinical Symptoms:

- Diarrhea, fever, fatigue, abdominal pain and cramping, blood in your stool, mouth sores, reduced appetite and weight loss, pain or drainage near or around the anus because of a fistula.
- Other signs and symptoms may include:
 - Inflammation of skin, eyes, and joints
 - Inflammation of liver or bile ducts
 - Delayed growth or sexual development (children)

Medical Management:

- Replace fluid and electrolytes lost through diarrhea and vomiting.
- Reduce risk of infections.
- Reduce inflammatory process.
- Surgery if necessary (total colectomy or right sided ileocollectomy)
- Prevent complications such as peritonitis, obstruction, renal calculi, and fistulas.
- Prevent thrombotic events.

Diet Therapy:

- High fruit and dietary fiber are protective.
- High intakes of mono- and disaccharides and total fat increases risk. Omega-3 fatty acids may be beneficial.
- Supplement diet with multivitamins and minerals (thiamin, folate, Vitamin B12, Vitamin E, Zinc, Vitamin D, calcium, magnesium, and iron)

- Reduce lactose if not tolerated. Also check for gluten and wheat intolerances.

III. Drug Therapy:

Discuss the use of the following drugs; include classification, mechanism of action, indications for use, and nutrient/drug interactions.

Drug Name	Classification	Mechanism of Action	Indications for Use	Nutrient/Drug Interactions
Reglan (Metoclopramide)	Antiemetic, Antigerd, Diabetic gastroparesis treatment	Dopamine receptor antagonist	Indicated for: -Symptomatic Gastroesophageal Reflux (short term therapy for people who do not respond to conventional therapy) -Diabetic Gastroparesis	May interact with foods containing lactose
Flagyl (Metronidazole)	Antibiotic, Amebicide, Antitrichomonal	Inhibits nucleic acid synthesis	Indicated for: -Symptomatic Trichomoniasis -Asymptomatic Trichomoniasis -Treatment of Asymptomatic Consorts -Amebiasis -Anaerobic Bacterial Infections -Intra-abdominal infections -Skin and skin structure infections -Gynecologic infections -Bacterial septicemia -Bone and joint infections -CNS infections -Lower respiratory tract infections -Endocarditis	Interacts with alcohol
Immodium (Loperamide)	Antidiarrheal	Acts on receptors along the small intestine to decrease muscle activity. It also slows down transit time.	Indicated for: -Control and symptomatic relief of acute and nonspecific diarrhea and chronic diarrhea in adults associated with inflammatory bowel disease.	Avoid alcohol

Lactulose	Laxative	Synthetic disaccharide	Indicated for: -Constipation -Conditions requiring facilitated bowel movements -Hepatic encephalopathy -Hepatic coma	-Individuals with hypersensitivity to lactose should not take this medication
Solumedrol	Corticosteroid	Anti-inflammatory glucocorticoid	Indicated for: -Allergic states (asthma, atopic dermatitis, etc). -Dermatologic diseases (exfoliative erythroderma, pemphigus, etc) -Endocrine disorders (primary or secondary adrenocortical insufficiency, congenital adrenal hyperplasia, etc) -Gastrointestinal diseases (regional enteritis, ulcerative colitis) -Hematologic disorders (acquired hemolytic anemia, congenital hypoplastic anemia, etc) -Neoplastic diseases -Nervous system (acute exacerbations of multiple sclerosis, craniotomy, etc) -Ophthalmic diseases -Renal diseases -Respiratory diseases -Rheumatic disorders	-Do not consume grapefruit or grapefruit juice -Dietary sodium restriction

IV. Nutritional Management:

A. Describe the nutritional management of the following problems:

- Diarrhea

- Limit foods and beverages that contain sugar, lactose, fructose, high-fructose corn syrup, and sorbitol.
- Avoid beverages with caffeine
- Eat a small meal or snack every 3 to 4 hours
- Avoid spicy foods
- Choose low-fiber foods (less than 2 grams)
- Increase fluid consumption
- Limit fat to 8 teaspoons/day

- Constipation

- Consume more whole grains and root vegetables. Gradually increase fiber, maintain adequate fluid intake, and exercise regularly.
- Atonic constipation – 20 – 35 g of fiber
- Spastic constipation – Decrease fiber during painful episodes. Gradually increase use of prune juice, dried fruits, raw fruits and vegetables, nuts, and whole grains.
- TF constipation – use a fiber-containing formula if appropriate. Use adequate flushes for hydration.
- Pediatric constipation – add more whole grains, fruits, and vegetables to diet; increase fluid intake.

- Dumping syndrome

- Additional use of soy and fermentable fiber; liquid pectin may prolong gastric emptying time and reduce onset of dumping.
- Eat 5 or 6 small meals a day. Drink 30 minutes after a meal.
- Increase protein, fiber, and complex carbohydrate intake.
- Avoid simple sugars which can be found in table sugar, candy, syrup, sodas, and juice beverages.
- Increase thickness of food.

- Early satiety

- Small, frequent, high-energy, high-protein meals and snacks.
- Suggest energy-dense liquids between meals to help meet fluid needs.
- Discourage intake of common gas producing foods.
- Avoid high fiber foods that may contribute to satiety.
- Chew food well.
- Encourage fluids be taken 30 minutes before or after meals/snacks.

- Lactose intolerance

- Limit or avoid food and drink that contain lactose.
- Lactase supplements help breakdown lactose

- Hard cheeses, yogurt, and cottage cheese contains lower amounts of lactose.

B. Describe the role of pre-biotics and pro-biotics in the management of GI disorders.

Although more research is needed regarding prebiotics and probiotics and their effect on our gut microbiota and GI diseases, it is widely known that the more good bacteria our gut has, the better our gut health will be. Prebiotics are the food that probiotics need in order to grow and thrive. Probiotics are live microorganisms that serve a number of purposes. For instance, “good bacteria” present in our gut help digest food, destroy microorganisms that may potentially cause disease and produce vitamins. For individuals with GI disorders, consumption of prebiotic and probiotic containing food products may help alleviate symptoms of certain GI disorders such as irritable bowel syndrome. However, as stated earlier, more research needs to be conducted regarding the health effects of prebiotics and probiotics.

C. How do dietary changes affect the microbiome?

Research has shown that carbohydrates have the most effect with regards to the growth of microorganisms in the gut since this is where they get most of their energy from. It was also pointed out by researchers that consumption of dietary fiber is very important for gut health because once fiber is consumed, it is fermented by microorganisms in the gut which then results in all the positive benefits associated with dietary fiber consumption. This means that an individual whose diet consists of the recommended amount of dietary fiber will most likely have a better gut microbiota than someone who does not consume fiber.

Besides fiber, other foods that we consume also have a big effect on our gut microbiome since the different microorganisms in our intestines prefer different types of food so depending on what one eats, some microorganisms may either increase or decrease in numbers.