Pediatric Gastrointestinal Disorders NCLEX Review

I. Anatomy and Physiology

The two major components of the gastrointestinal (GI) system are the alimentary canal and the accessory organs. The alimentary canal is commonly referred to as the GI tract and consists of the following:

Oral cavity

Pharynx

Esophagus

Stomach

Small intestine

Large intestine

THE ESOPHAGUS

Digestion involves mechanical and chemical processes, both of which begin in the mouth. Chewing, movement through the GI tract, and churning within the stomach are parts of the mechanical process. Saliva, hydrochloric acid, bile, and other digestive enzymes all contribute to the chemical process of digestion. The esophagus extends from the oropharynx to the stomach. At the top of the esophagus is the upper esophageal sphincter(UES)to prevent the influx of air into the esophagus during respiration. At the bottom of the esophagus is the lower esophageal sphincter(LES)that prevents the reflux of acid from the stomach into the esophagus.

THE STOMACH

The contents of the esophagus empty into the stomach through the cardiac sphincter. The stomach has three parts: the fundus, body, and pylorus. The fundus is the upper portion of the stomach that connects to the lower end of the esophagus. The body is the middle portion of the stomach where gastrin secretes. Gastrin promotes secretion of pepsinogen and hydrochloric acid, pepsin, and lipase, all of which aid digestion, and mucus formation, which helps protect the stomach lining. The pylorus is the lower portion of the stomach that connects to the duodenum by the pyloric sphincter.

THE LIVER

The liver is a very vascular organ located in the right upper quadrant of the abdomen under the diaphragm. It has two main lobes that are comprised of smaller lobules. The liver stores a variety of vitamins and minerals. It metabolizes proteins; synthesizes plasma proteins, fatty acids, and triglycerides; and stores and releases glycogen. The liver detoxifies foreign substances such as

alcohol, drugs, or chemicals. The liver forms and secretes bile to aid in digestion of fat. Bile will release into the gallbladder for storage or into the duodenum if needed for digestion if the sphincter of Oddi is open due to the secretion of the digestive enzymes secretin, cholecystokinin, and gastrin. The gallbladder is a small receptacle that holds bile until it is needed. It is located on the inferior aspect of the liver.

THE PANCREAS

The pancreas is located retroperitoneally in the upper abdomen near the stomach and extends from just right of midline to the left toward the spleen. The pancreas has both endocrine and exocrine functions. The endocrine functions include secretion of insulin in response to elevations in blood glucose from the beta cells of the islets of Langerhans and glucagon in response to decrease in blood glucose from the alpha cells. The exocrine function includes secretion of trypsin, lipase, amylase, and chymotrypsin to aid in digestion.

THE INTESTINES

The small intestine is comprised of the duodenum, jejunum, and the ileum. The duodenum attaches to the stomach, is about a foot long and C-shaped, and it curves to the left around the pancreas. The common bile duct and pancreatic duct enter here. The jejunum is between the duodenum and ileum and is about 8 feet long. The last portion of the small intestine is the ileum, which is up to 12 feet long, depending on the size of the patient. The ileocecal valve separates the ileum from the large intestine. The appendix is found at this juncture. The large intestine can be broken down into the ascending colon, transverse colon, descending colon, and sigmoid colon. The sigmoid colon joins the rectum and ultimately the anal canal. Food moves through the GI tract through a process called peristalsis. Peristalsis is the pushing of food through pulsating muscle action.

II. Cleft Lip and Cleft Palate

Cleft lip and cleft palate are congenital anomalies that occur as a result of failure of soft tissue or bony structure to fuse during embryonic development. The defects involve abnormal openings in the lip and palate that may occur unilaterally or bilaterally and are readily apparent at birth.

NCLEX!!! A cleft palate may not be detected until feeding problems develop or until the first-month examination of the infant if the infant’s lip is normal.

Signs and Symptoms:

- Distended abdominal due to swallowing air
- Abnormal formation of the lip
- Abnormal formation of the palate

Diagnostics: Prenatal ultrasonography shows cleft lip

Treatment:

- Cheiloplasty to surgically repair the cleft lip within the first 3 months after birth to provide adequate sucking.

- Palatoplasty to surgically repair the cleft palate between 12 months and 18 months of age before the child begins speaking.

Nursing Interventions:

1. Elevate the infant when feeding.
2. Use an oversized nipple.
3. Stimulate the sucking reflex because this helps with speech.
4. Give the infant time to swallow to prevent choking.
5. Feed slowly giving the infant a rest period after swallowing.
6. Burp frequently to expel swallowed air and prevent vomiting.
7. Provide small, frequent feedings to prevent the infant from getting tired.
8. Give water following feedings to flush food from the mouth and thereby preventing the growth of microorganisms.
9. Cleft palate:
   • Feed using a cleft palate nipple.
   • Use a Teflon implant for feeding.
   • Assess for abdominal distention.
   • Strict intake and output.
   • Assess the ability to suck.
   • Monitor the vital signs.
10. Postoperative care:

- Maintain airway.
- Monitor for respiratory distress.
- Restrain the infant from accessing the site.
- Clean the site after feeding.
- Place the infant on the right side after feedings to prevent aspiration.
- Cleft palate:
    - Don’t use a pacifier.
    - Use a cup rather than a nipple for feeding.
    - Don’t brush teeth for 2 weeks following surgery.
    - Don’t use pointed objects near the infant’s mouth.
    - Explain the disorder and treatment to the family.

III. Lactose Intolerance

Inability to tolerate lactose as a result of an absence or deficiency of lactase, an enzyme found in the secretions of the small intestine that is required for the digestion of lactose.

Signs and Symptoms:

- Abdominal Distention
- Crampy, abdominal pain; colic
- Diarrhea and excessive flatus

Nursing Interventions:

1. Eliminate the offending dairy product, or administer an enzyme tablet replacement.
2. Provide information to the parents about enzyme tablets that predigest the lactose in dairy products or supplement the body's own lactase.
3. Substitute soy-based formulas for cow's milk formula or human milk.
4. Limit milk consumption to 1 glass at a time.
5. Instruct the child and family that the child should drink milk with other foods rather than by itself.
6. Encourage consumption of hard cheese, cottage cheese, and yogurt, which contain the inactive lactase enzyme.
7. Encourage consumption of small amounts of dairy foods daily to help colonic bacteria adapt to ingested lactose.
8. Instruct the parents about the foods that contain lactose, including hidden sources.

NCLEX!!! A child with lactose intolerance can develop calcium and vitamin D deficiency. Instruct the parents about the importance of providing these supplements.

IV. Celiac Disease

Celiac disease occurs when enzymes in the intestinal mucosal cells are damaged when they are in contact with gluten, resulting in decreased absorption by the small intestines. Gluten is a protein found in wheat, rye, oats, and barley. Celiac disease is detected in infants when they are introduced to gluten-containing food

Nursing Interventions:

Basics of a Gluten-free Diet

Foods Allowed	Foods Prohibited
Beef, pork, poultry, and fish; eggs; milk and some dairy products; vegetables, fruits, rice, corn, gluten-free flour, puffed rice,cornflakes,cornmeal, and precooked gluten-free cereal	Commercially prepared ice cream; malted milk; prepared puddings; and grains, including anything made from wheat, rye, oats, or barley, suchasbreads,rolls,cookies,cakes,crackers, cereal, spaghetti, macaroni noodles, beer, and ale.

1. Maintain a gluten-free diet, substituting corn, rice, and millet as grain sources
2. Administer mineral and vitamin supplements, including iron, folic acid, and fat-soluble vitamins A, D, E, and K.
3. Teach the child and parents about a gluten-free diet and about reading food labels carefully for hidden sources of gluten.

V. Appendicitis

Appendicitis is the inflammation of the vermiform appendix, which is a blind pouch located near the ileocecal valve in the right lower quadrant of the abdomen that may be obstructed by stool. The mucosal lining of the appendix continues to secrete fluid, which will increase the pressure within the lumen of appendix, causing a restriction of the blood supply to the appendix. This decrease in blood supply may result in gangrene or perforation as the pressure continues to build. Pain localizes at the McBurney point,located midway between the umbilicus and right anterior iliac crest. Appendicitis may occur at any age, but the peak occurrence is from the teenage years to age 30.

NCLEX!!! Rupture of the appendix is more likely to occur in acute appendicitis within the first 36 to 48 hours and can result in peritonitis, which is inflammation of the peritoneum, the membrane lining the abdominal cavity. Rapid diagnosis and surgical intervention are necessary to avoid rupture of the appendix.

Signs and Symptoms:

- Abdominal pain begins periumbilical and travels to right lower quadrant.
- Rebound pain, pain when pressure on the abdomen is quickly removed, occurs with peritoneal inflammation.
- Guarding, protecting the abdomen from painful exam.
- Rigidity of the abdomen (abdomen feels more firm when palpating).
- Fever due to infection.
- Nausea and Vomiting.
- Loss of appetite
- Peritonitis - Results from a perforated appendix

Assessment:

1. Increased fever
2. Progressive abdominal distention
3. Tachycardia and tachypnea
4. Pallor
5. Chills

NCLEX!!! An indication of a perforated appendix is the sudden relief of pain and then a subsequent increase in pain accompanied by right guarding of the abdomen.

Nursing Interventions:

Appendectomy - Surgical removal of the appendix

1. Pre-Op Interventions:

a. Maintain NPO status.

b. Administer IV fluids and electrolytes as prescribed to prevent dehydration and correct electrolyte imbalances.

c. Monitor for changes in the level of pain.

d. Monitor for signs of a ruptured appendix and peritonitis.

e. Avoid the use of pain medications so as not to mask pain changes associated with perforation.

f. Administer antibiotics as prescribed.

g. Monitor bowel sounds.

h. Position in a right side-lying or low to semi-Fowler's position to promote comfort.

i. Apply ice packs to the abdomen for 20 to 30 minutes every hour if prescribed. j. Avoid the application of heat to the abdomen.

k. Avoid laxatives or enemas.

2. Postoperative intervention:

a. Monitor vital signs, particularly temperature.

b. Maintain NPO status until bowel function has returned, advancing the diet gradually as tolerated and as prescribed when bowel sounds return.

c. Assess the incision for signs ofinfection, such as redness, swelling, drainage, and pain.

d. Monitor drainage from the drain, which may be inserted if perforation occurred.

e. Position the child in a right side-lying or low to semi-Fowler's position with the legs slightly flexed to facilitate drainage.

f. Change the dressing as prescribed, and record the type and amount of drainage.

g. Perform wound irrigations if prescribed.

h. Maintain nasogastric tube suction and patency of the tube if present.

i. Administer antibiotics and analgesics as prescribed.

VI. Hirschsprung Disease

A congenital condition where there is the lack of nerve cells in the colon causing a lack of peristalsis, resulting in stool being unable to be pushed through the colon.

Assessment:

Newborns	Children

Failure to pass meconium stool Abdominal Distention Bile stained vomitus Refusal to suck	Failure to gain wt and delayed growth Abdominal distention Vomiting Constipation alternating with diarrhea Ribbon-like and foul-smelling stools

Management:

1. Maintain a low-fiber, high-calorie, high-protein diet; parenteral nutrition may be necessary in extreme situations.

2. Administer stool softeners as prescribed.

3. Administer daily rectal irrigations with normal saline to promote adequate elimination and prevent obstruction as prescribed.

Preoperative interventions:

• Nothing by mouth.

• Administer IV fluids as ordered to prevent maintain fluid and electrolyte balance.

• Insert an nasogastric (NG) tube to decompress the upper GI tract.

• Administer normal saline or mineral oil enemas to clean the bowel.

• Administer antibiotics as ordered.

NCLEX!!! If the colon is obstructed, a temporary colostomy or ileostomy is performed to decompress the colon. Once decompressed, a second surgery is performed to remove the affected portion of the colon and remove the colostomy or ileostomy.

Postoperative Interventions:

• Strict input and output.

• Provide care for the colostomy or ileostomy, if necessary.

• Monitor bowel sounds.

• Begin feeding by mouth when bowel sounds are present.

• Nothing should be placed in the rectum.

• Monitor for constipation.

NCLEX!!! Tell the family to call the health-care provider at the first signs of constipation, dehydration, fever, vomiting, and diarrhea.

NCLEX!!! Don't use tap water in the enema because this can induce water intoxication. Return of anal sphincter control and complete continence can take months to develop.

NCLEX!!! Monitor for fecal vomiting.

VII. Pyloric Stenosis

Spasms of the pylorus muscle in the pyloric sphincter that connects the stomach to the duodenum, causing the pyloric sphincter to become inflamed and swell, thus preventing the stomach from emptying into the duodenum. The cause is unknown and is seen in children between 1 and 6 months of age.

Nursing Interventions:

1. Monitor strict intake and output.
2. Monitor vomiting episodes and stools.
3. Obtain daily weights.
4. Monitor for signs of dehydration and electrolyte imbalances.
5. Prepare the child and parents for pyloromyotomy if prescribed.

Pyloromyotomy - An incision through the muscle fibers of the pylorus; may be performed by laparoscopy

Preoperative interventions:
a. Monitor hydration status by daily weights, intake and output, and urine for specific gravity.
b. Correct fluid and electrolyte imbalances; administer fluids intravenously as prescribed for rehydration.
c. Maintain NPO status as prescribed.
d. Monitor the number and character of stools.
e. Maintain patency of the nasogastric tube placed for stomach decompression.

Postoperative interventions:
a. Monitor intake and output.
b. Begin small, frequent feedings postoperatively as prescribed.
c. Gradually increase amount and interval between feedings until a full feeding schedule has been reinstated.
d. Feed the infant slowly, burping frequently, and handle the infant minimally after feedings.
e. Monitor for abdominal distention.
f. Monitor the surgical wound and for signs of infection.
g. Instruct the parents about wound care and feeding.

VIII. Intussusception

A disorder where the intestine telescopes and causes inflammation and edema resulting in blood vessel occlusion leading to necrosis. Intussusception occurs between 6 months and 3 years of age and is common in children who have cystic fibrosis.

NCLEX!!! Intussusception is an emergency condition. Treatment must begin within 24 hours.

Nursing Interventions:

1. Monitor for signs of perforation and shock as evidenced by fever, increased heart rate, changes in level of consciousness or blood pressure, and respiratory distress, and report immediately.
2. Antibiotics, IV fluids, and decompression via nasogastric tube may be prescribed.
3. Monitor for the passage of normal, brown stool, which indicates that the intussusception has reduced itself.
4. Prepare for hydrostatic reduction as prescribed,if no signs of perforation or shock occur (in hydrostatic reduction, air or fluid is used to exert pressure on area involved to lessen, diminish, or rid the intestine of prolapse).
5. **Posthydrostatic reduction**
    1. Monitor for the return of normal bowel sounds, for the passage of barium, and the characteristics of stool.
    2. Administer clear fluids, and advance the diet gradually as prescribed.
6. If surgery is required, postoperative care is similar to care after any abdominal surgery; procedure may be done via laparoscope.

IX. Abdominal Wall Deficits

1. Omphalocele

Herniation of the abdominal contents through the umbilical ring, usually with an intact peritoneal sac. The protrusion is **covered by a translucent sac** that may contain bowel or other abdominal organs. Rupture of the sac results in evisceration of the abdominal contents. Immediately after birth, the **sac is covered with sterile gauze soaked in normal saline** to prevent drying of abdominal contents; a layer of plastic wrap is placed over the gauze to provide additional protection against moisture loss. Monitor vital signs frequently (every 2 to 4 hours), particularly **temperature**, because the infant can lose heat through the sac.

Preoperative Nursing Care: Maintain NPO status, administer IVfluidsasprescribed to maintain hydration and electrolyte balance, monitor for signs of infection, and handle the infant carefully to prevent rupture of the sac.

Postoperative Nursing Care: Control pain, prevent infection, maintain fluid and electrolyte balance, and ensure adequate nutrition.

2. Gastroschisis

1. Gastroschisis occurs when the herniation of the intestine is lateral to the umbilical ring. **No membrane covers the exposed bowel**. The **exposed bowel** is **covered loosely in saline soaked pads**, and the abdomen is loosely wrapped in a plastic drape or bowel bag; wrapping directly around the exposed bowel is contraindicated because if the exposed bowel expands, wrapping could cause pressure and necrosis.

Preoperative Nursing Care: Similar to omphalocele; surgery is performed within several hours after birth because no membrane is covering the sac.

Postoperative Nursing Care: Most infants develop prolonged ileus, require mechanical ventilation, and need parenteral nutrition; otherwise, care is similar to that for omphalocele.

1. **Volvulus**

A a disorder where the intestine twists around itself as a result of ingesting a foreign substance and adhesion or from unknown causes that result in blood vessels to compress and an ischemia to that can lead to necrosis.

Assessment:

- Abdominal pain
- Vomiting after feeding
- No bowel sounds
- Bloody stool
- Distended abdomen

NCLEX!!! Administer stool softeners following surgery because opioid analgesics decrease GI motility.

Nursing Interventions:

1. Nothing by mouth.
2. Insert NG tube to decompress the GI tract.
3. Monitor bowel sounds.
4. Monitor bowel movements

Postoperative care:
- Increase dietary fiber and fluid and increase the child's activity to encourage normal bowel movements.
- Explain the disorder and treatment to the family.

XI. Tracheoesophageal Atresia and Esophageal Atresia

A tracheoesophageal fistula is a congenital anomaly in which the trachea and the esophagus are connected. A child with a tracheoesophageal fistula is likely to have an esophageal atresia where the esophagus ends in a blind pouch preventing food from entering the stomach. These disorders occur approximately at 5 weeks of gestation when the foregut normally develops into the trachea

and esophagus.

Maternal polyhydramnios (excessive amniotic fluid) noted prenatally is a suspicious finding, especially if the mother is not diabetic. The fetus with an incomplete gastrointestinal system is unable to swallow amniotic fluid, which results in excess amniotic fluid in the uterine cavity.

NCLEX!!! Tracheoesophageal fistula and esophageal atresia are an emergency condition.

Assessment:

1. Frothy saliva in the mouth and nose and excessive drooling
2. The “3 Cs”—coughing and choking during feedings and unexplained cyanosis
3. Regurgitation and vomiting
4. Abdominal distention
5. Increased respiratory distress during and after feeding

Preoperative Care:

Nothing by mouth:
• Insert the NG tube as ordered.

- Suction the contents of the blind pouch as ordered.
- **NCLEX!!!** No pacifier prior to surgery because sucking increases saliva production. Saliva can enter the lungs through the fistula and/or accumulate in the blind pouch.

Postoperative care:
• Monitor vital signs.
• Place NG tube to low suction per order.
• Monitor output of NG tube every 4 hours.
• Provide gastrostomy feeding until esophagus returns to normal.
• Monitor chest tube drain, if necessary.
• Use pacifier.
• Start feeding by mouth with sterile water and then advance diet as tolerated.

XII. Ulcerative Colitis

Ulcerative colitis is an inflammation of the large intestine affecting the mucosal layer beginning in the rectum and colon and spreading into the adjacent tissue. Ulcerations in the mucosal layer of the intestinal wall lead to inflammation and abscesses, resulting in bloody diarrhea with mucus, which is the primary symptom.
There are periods of exacerbations and remissions. Symptom severity may vary from mild to severe. The exact cause is unknown, but there is increased incidence in people with northern European, North American, or Ashkenazi Jewish origins. The peak incidences are from mid-teen to mid-20s and again from mid-50s to mid-60s.

Patients may have an increase in symptoms with each flare-up of the disease.

Malabsorption of nutrients can cause weight loss and health problems. Some patients need surgery to resect the affected area of the large intestine, resulting
in a colostomy, ileal reservoir, ileoanal anastomosis, or ileoanal reservoir. There is an increased risk of colon cancer in patients with ulcerative colitis. The patient is also at risk for developing toxic megacolon or perforating the area of ulceration.

- Weight loss
- Abdominal pain
- Chronic bloody diarrhea with pus due to ulceration
- Electrolyte imbalance due to diarrhea
- Tenesmus, which is a persistent desire to empty bowel

Diagnostics:

- Blood count: Decreased hemoglobin (anemia), hematocrit due to blood loss and chronic disease
- Erythrocyte sedimentation rate: Elevated due to inflammation
- Electrolytes: Abnormal due to diarrhea and poor absorbance of nutrients
- Double-contrast barium enema: Shows ulceration and inflammation.
- Sigmoidoscopy: Shows ulcerations and bleeding
- Colonoscopy: Shows ulcerations and bleeding

Ulcerative Colitis:

Treatment:

- Keep stool diary to identify irritating foods.
- Low-fiber, high-protein, high-calorie diet.

Administer antidiarrheal medications:
• Loperamide
• Diphenoxylate hydrochloride and atropine
Administer salicylate medications to reduce inflammation within the intestinal mucosa:
• Sulfasalazine
• Mesalamine
• Olsalazine
• Balsalazide
Administer corticosteroids during exacerbations to reduce inflammation:
• Prednisone
• Hydrocortisone
Nothing by mouth to rest the bowel during exacerbations.
Administer anticholinergics to reduce abdominal cramping and discomfort:
• Dicyclomine
Surgical resection of affected area of large intestine.

NCLEX!!! Monitor for toxic megacolon (distended and tender abdomen, fever, elevated WBC, elevated pulse, distended colon).

Nursing Interventions:

1. Monitor intake and output.
2. Monitor stool output, frequency.
3. Weigh patient regularly.
4. Provide a sitz bath to soothe the skin.
5. Administer A and D ointment or barrier cream to skin.
6. Administer witch hazel to soothe sensitive skin.
7. Teach:
   • Dietary modification, foods to avoid
   • Medication use, schedule, and side effects
   • Importance of follow-up care
   • Proper wound care for postoperative patients
   • Proper skin care of perianal area to avoid skin breakdown
   • Avoidance of fragrant products that can be irritating
   • Home care for new ostomy patients

XIII. Parasitic Infections

Giardiasis is caused by protozoa and is prevalent among children in crowded environments, such as classrooms or day care centers.

Nursing Interventions:

1. Medications that kill the parasites may be prescribed; medications are not usually prescribed for children younger than 2 years.
2. Caregivers should wash hands meticulously.
3. Provide education to family and caregivers regarding sanitary practices.

2. Pinworms (enterobiasis) are universally present in temperate climate zones and are easily transmitted in crowded environments.

Nursing Interventions:

1. Perform a visual inspection of the anus with a flashlight 2 to 3 hours after sleep.
2. The tape test is the most common diagnostic test.
3. Educate the family and caregivers regarding the tape test. A loop of transparent tape is placed firmly against the child’s perianal area; it is removed in the morning and placed in a glass jar or plastic bag and transported to the laboratory for analysis.
4. Medications that kill the parasites may be prescribed; medications are not usually prescribed for children younger than 2 years.
5. The medication regimen may be repeated in 2 weeks to prevent reinfection.
6. All members of the family are treated for the infection.
7. Teach the family and caregivers about the importance of meticulous hand washing and about washing all clothes and bed linens in hot water.