



Certified Pediatric Nurse Review Course: Gastrointestinal Disorders and Nutrition

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Objectives

- Recall acquired and congenital gastrointestinal problems that interfere with digestion, absorption and elimination.
- Assess and plan care for children with common gastrointestinal disorders.
- Plan feeding interventions for a child with anomalies that interfere with ingesting nutrients.

Introduction

Most GI abnormalities begin during fetal life but may not be discovered during the neonatal period.

The signs and symptoms depend on which area of the GI tract is affected

In assessing the abdomen, remember that **auscultation must come before percussion and palpation** for an accurate assessment of bowel sounds



Vomiting

Vomiting Introduction

- Vomiting is the forceful emptying of stomach contents by mouth
- Mostly caused from a GI disorder
- Most common cause of infant vomiting = overfeeding
- Initial priority in evaluation of a vomiting child is exclusion of serious and life-threatening conditions that may present with vomiting:
 - Abdominal emergencies
 - Increased intracranial pressure
 - Metabolic crisis, infections
 - Toxic ingestions



Vomiting Assessment



Vomiting history



Describe the emesis



Assess the abdomen



Measure the abdomen



Check for dehydration



Assess for metabolic alkalosis



Evaluate feeding methods

Vomiting Interventions

Prevent aspiration; position the child on their side



Suction if necessary



Elevate the head of the bed



Antiemetic medications

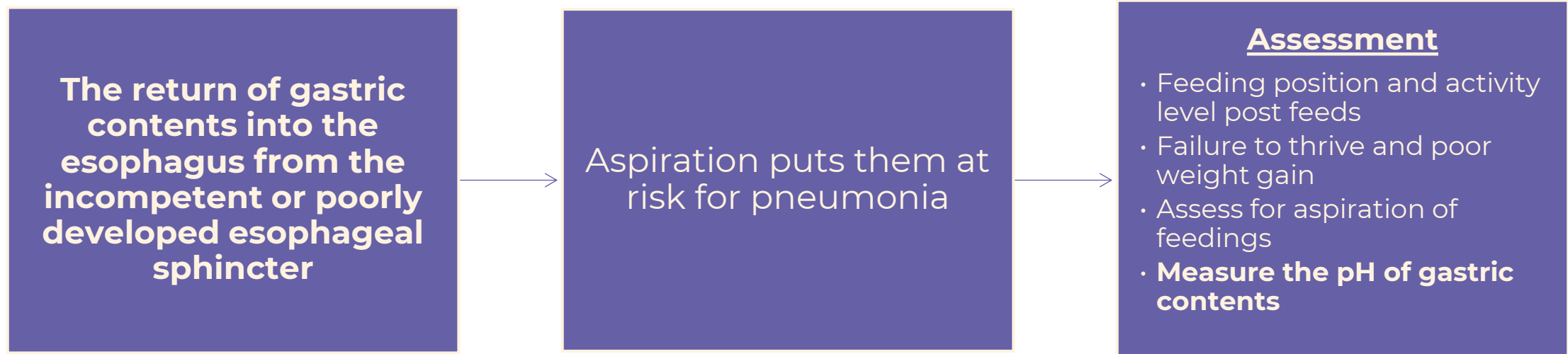


Offer clear liquids if obstruction is ruled out



Gastroesophageal Reflux (GER)

Gastroesophageal Reflux (GER) Introduction





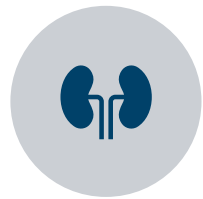
GER Interventions

- **Administer medications 30 minutes before meals: this maximizes the benefits**
- **Thicken Formula (1 tablespoon cereal/ 1 ounce of formula). Need to enlarge hole in nipple or use cross-cut nipple**
- Feed the child in an upright position; keep upright for 30 minutes after feed



Diarrhea

Diarrhea Introduction



Increased frequency & amount and decreased consistency of stool



Occurs when water in the bowel increases from osmotic pull, with electrolyte imbalances, or when peristalsis increases preventing water from being absorbed



May accompany gastroenteritis and inflammation



Can result from autonomic changes, malabsorption conditions, GI allergies, or toxins



It can lead to metabolic acidosis and dehydration through the loss of HCO_3 in the stool



In infants, rotavirus is a major cause

Diarrhea Assessment



Amount, frequency, duration, consistency, appearance and odor of the stool; weigh diapers



Test stool for blood and other reducing substances (sugars) and for pH; obtain stool cultures if ordered



Assess: abdominal pain/cramping associated with stooling, hydration status, bowel sounds, palpate for masses, distension, and pain

Diarrhea Interventions

- Mild → Regular diet. **Avoid fruit juices and soft drinks because of their high osmotic load**
- Severe → **For infants, initiate oral rehydration solutions such as Pedialyte, continue breastfeeding or formula**

★ **Note: The BRAT diet (bananas, rice, applesauce, and toast) is NOT recommended by the American Academy of Pediatrics due to the lack of protein** ★



Constipation

Constipation



- **Constipation is a decreased amount and increased consistency of stool compared to the patient's normal pattern**
- **Children do NOT need to have a bowel movement every day**
- Cause can be due to a diet low in liquids or high in fat and protein
- Determine constipation vs serious cause
- Differentiate functional constipation from potential organic cause

Constipation Assessment

- Hard, dry, infrequent stool
- Test stool for blood (guaiac test)
- Imaging
- Hard, distended abdomen
- **Assess the child's diet for liquids, fiber, carbohydrates, and constipating foods**
- **May present as encopresis/fecal incontinence with involuntary soiling of clothing as impacted stool collects in colon and rectum**





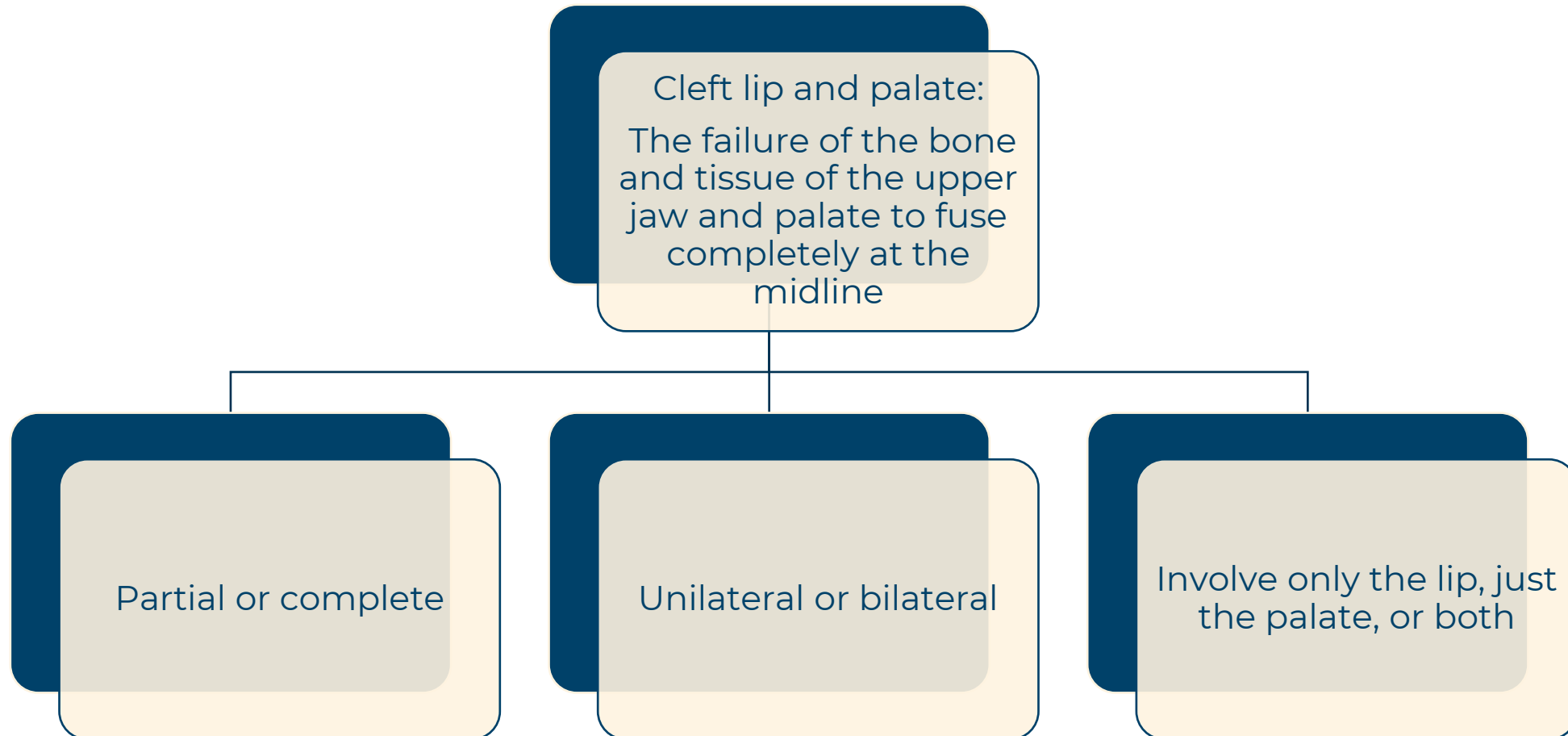
Constipation Intervention

- May have to digitally remove stool
- Administer stool softeners: suppositories, mineral oil, and docusate sodium (Colace)
- **Add fiber or prune juice to the diet; increase fluid intake**
- Administer enema, if ordered, use isotonic solutions only



Cleft Lip and Palate

Cleft Lip and Palate Introduction



Cleft Lip and Palate Assessment

1

Visually
inspect and
palpate the
palate

2

Assess the
quality of the
infant suck

3

Assess the
child's ability
to swallow

4

Assess for
abdominal
distension

5

**Monitor for
respiratory
distress when
feeding**

Pre-Operative Interventions for Cleft Lip

Feed infants slowly
and in an upright
position

Burp often

**Feed with a
specialized
nipple**

Gavage feedings

Small amounts of
water after
feeding

Promote sucking

Post-operative Interventions for Cleft Lip Repair (cheiloplasty)

Cheiloplasty → Unites the lip and gum edges for future teeth, provides a route for nutrition, promotes sucking, and improves the infant's appearance



[File:Cleft Lip Repair.png - Wikimedia Commons](#)

Post-operative Care for Cleft Lip Repair (continued) (cheiloplasty)

- **Maintain a patent airway/observe for cyanosis**
- **Maintain an intact suture line; keep infant's hands away from their mouth**
- **Prevent tension on the suture line**
- Give extra care and support
- Haberman feeder
- **Clean suture line after each feeding with warm water and apply antibiotic ointment**
- Monitor/treat pain



Pre-Operative Interventions for Cleft Palate

- **Must be weaned from the bottle or breast before a cleft palate surgery**
- **Surgery is usually scheduled before child is 1 year old**
- Teach the parents that the infant is susceptible to pathogens and otitis media (ear infections)

Post-Operative Interventions for Cleft Palate (staphylorrhaphy)

- Maintain a patent airway
- Anticipate edema in airway
- **Keep pointed objects away**
- **Do not use suction catheters**
- **Use a cup to feed; do not use a nipple or pacifier**



Cleft Palate

Cleft Palate After Repair

[File:Cleft Palate Repair.png - Wikimedia Commons](#)

Post-Operative Interventions for Cleft Palate (continued) (staphylorrhaphy)

- **Use elbow restraints** to keep the child's hands out of the mouth
- Provide soft toys
- Clear liquids and progress to a soft diet
- Rinse the suture line by giving child a sip of water post meal



A photograph of four young children sitting on a grassy lawn outdoors. They are all smiling and clapping their hands. The child in the center is a young boy with curly hair wearing a white t-shirt. To his left is a girl with curly hair in a striped shirt. To his right is a girl with long dark hair in a pink shirt. On the far right, another girl is partially visible, also smiling. The background shows green trees and a clear sky.

Esophageal Atresia (EA) and Tracheoesophageal Fistula (TEF)

EA and TEF Introduction

Atresia→ the termination of a passageway; usually refers to a pathologic closure or the absence of a normal anatomic opening

- **EA:** when the proximal end of the esophagus, ends in a blind pouch
- **Food cannot enter the stomach via the esophagus**

Fistula→ a tube-like connection between two structures

- **TEF:** when there is a connection between the esophagus and the trachea
- Aspiration of food/liquid in lungs

EA with TEF

When either the distal end of the esophagus ends in a blind pouch and the proximal end of the esophagus is connecting to the trachea by a fistula

OR

When the proximal end of the esophagus ends in a blind pouch and the distal portion of the esophagus is connected to the trachea via a fistula

Assessment of TEF

- Maternal history of excess amniotic fluid
- **Newborn with a lot of oral secretions**
- **Assess for choking, coughing and intermittent cyanosis during feeds**
- **Abdominal distension**
- **Tracheal irritation**



Interventions

If EA or TEF is suspected, do not feed by mouth



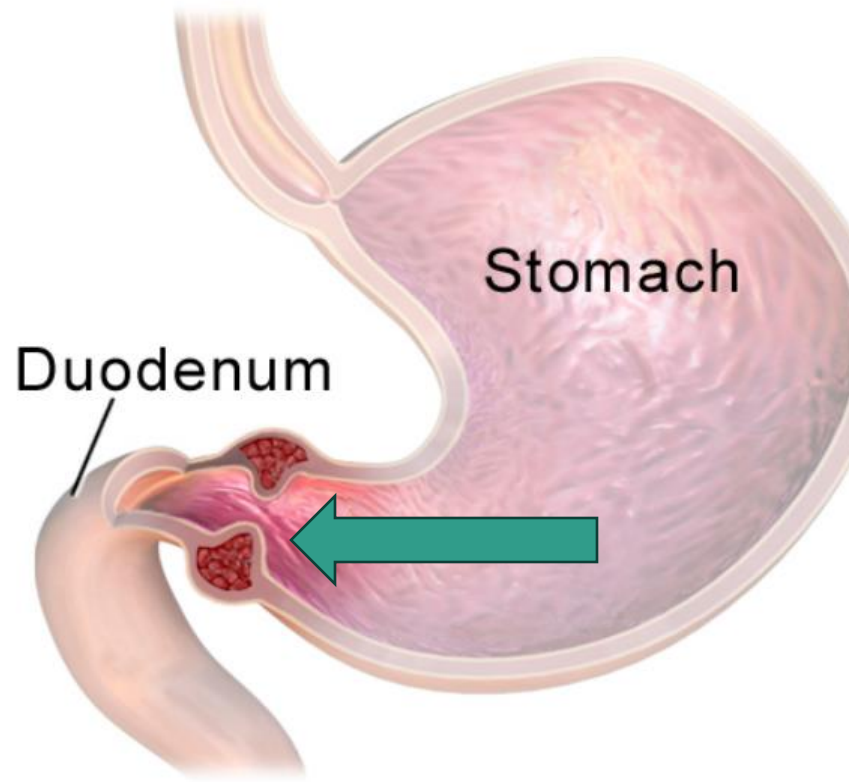
A percutaneous endoscopic gastrostomy (PEG) tube may be inserted



Surgery to correct TEF



Pyloric Stenosis



**Thick Pyloric
Muscle
Before Surgery**

Pyloric Stenosis Introduction

- Pyloric stenosis is an increasing hyperplasia and hypertrophy of the circular muscle at the pylorus
- This narrows the pyloric canal as it exits the stomach

Pyloric Stenosis Assessment



Projectile emesis during or shortly after feedings (preceded by revers peristaltic waves [going left to right] but not nausea)



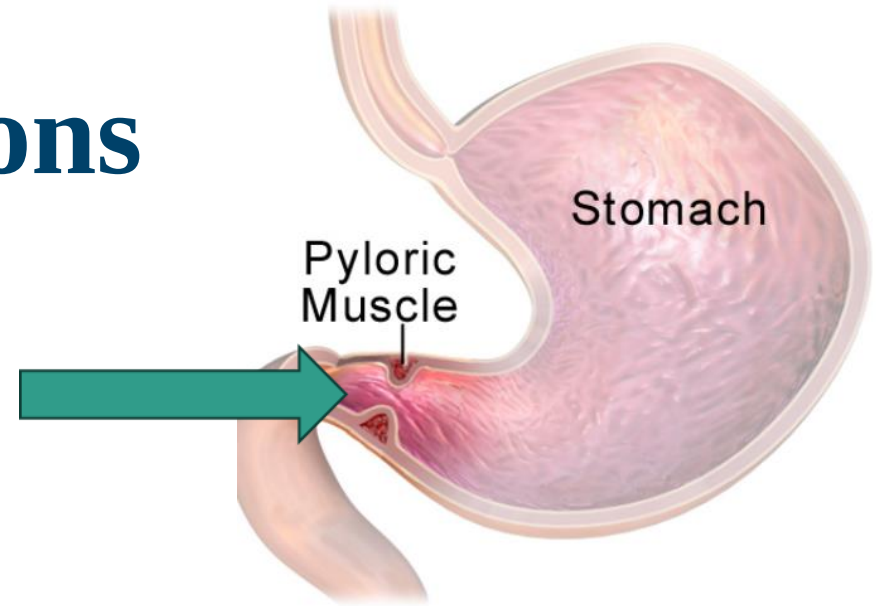
Evaluate for poor weight gain and symptoms of malnutrition despite the child's apparent hunger



May palpate for an olive-size bulge below right costal margin

Pyloric Stenosis Interventions

- Provide small, frequent feedings
- Elevate head of the bed
- Burp frequently
- Correct any electrolyte imbalance



Pyloric Muscle After Surgery

[File:Pyloric Stenosis.png - Wikimedia Commons](#)

Prepare for surgery:

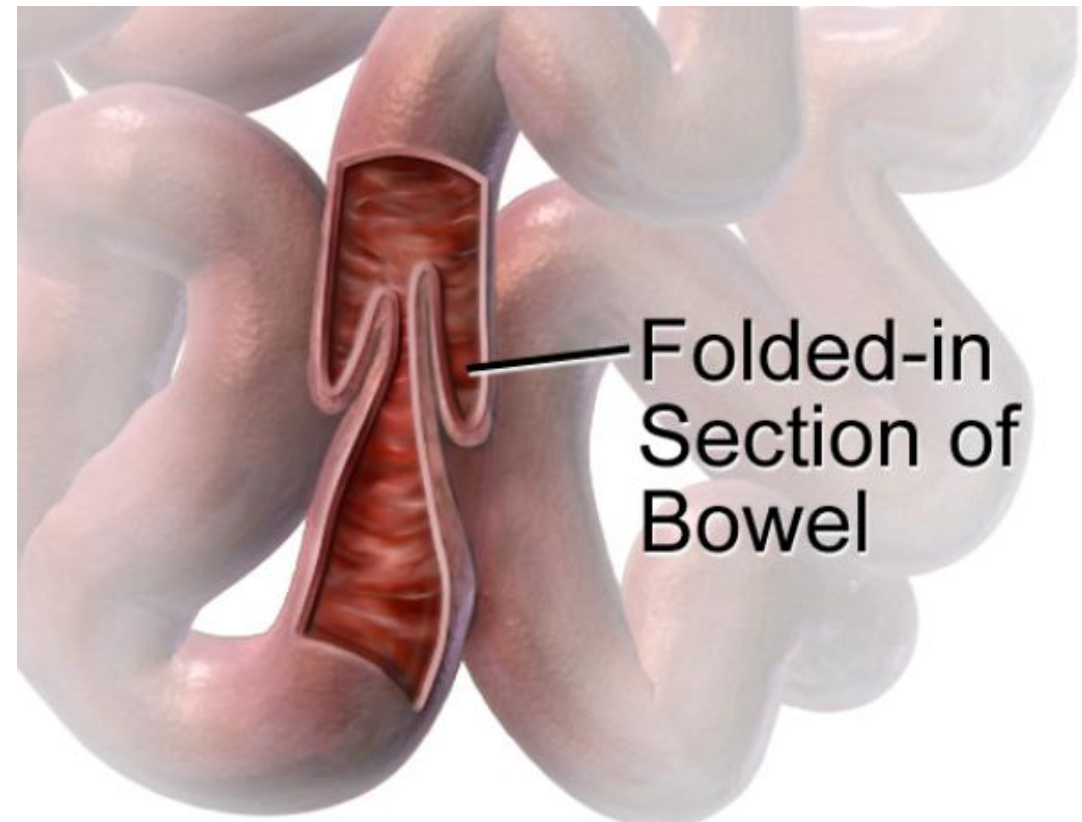
- **Pyloromyotomy** → The overdeveloped muscle around the pyloric valve is split, which opens the muscle and enlarging the pylorus to relieve the obstruction



Intussusception

Intussusception Introduction

- **Intussusception is the telescoping of a bowel segment into itself, the most common site being the ileocecal valve**
- **Usually occurs between 3 and 24 months**
- The condition may result from polyps, hyperactive peristalsis, an abnormal bowel lining or unknown cause
- Can be acute or chronic; if untreated it may lead to *peritonitis*



Intussusception

Assessment

- Sudden attack of acute abdominal pain
- Bile emesis
- **Red currant jelly-like stool (blood and mucus)**
- Distended abdomen
- Pale
- Agitation

Intervention

- **Barium enema with air pressure to confirm the condition and reduce the intestinal telescoping by pressure**

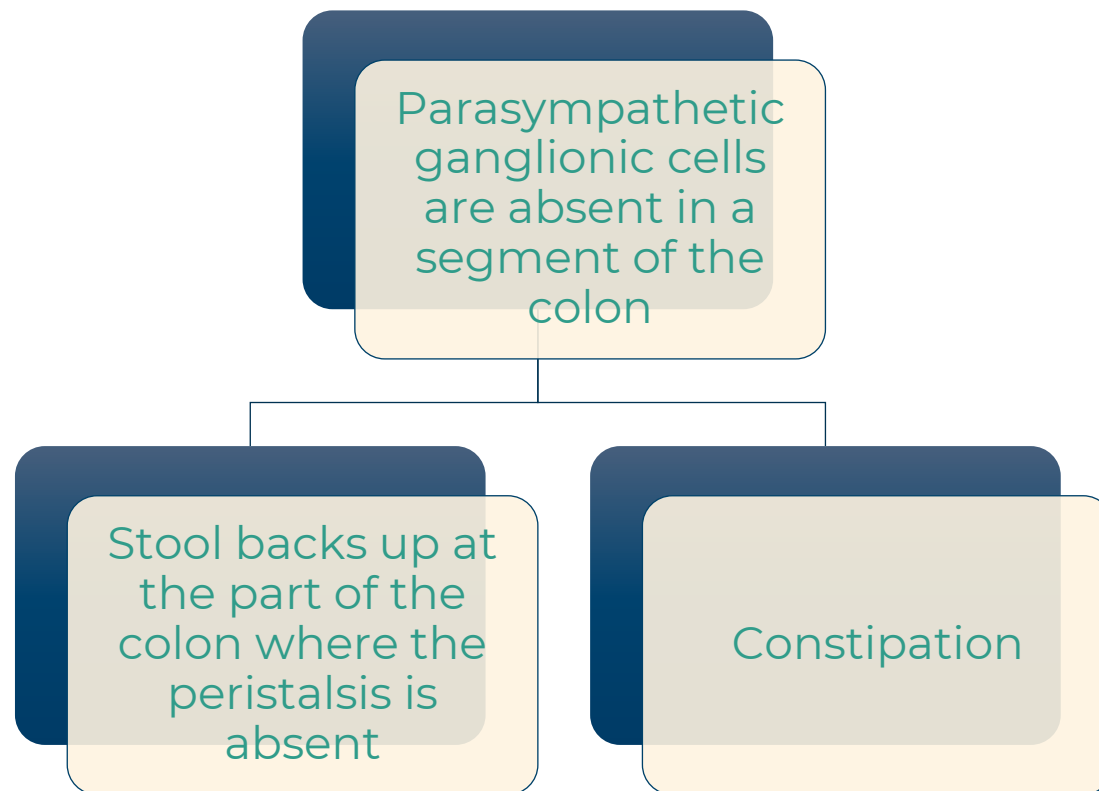




Congenital Aganglionic Megacolon/Hirschsprung Disease

Congenital Aganglionic Megacolon/Hirschsprung Disease

Introduction



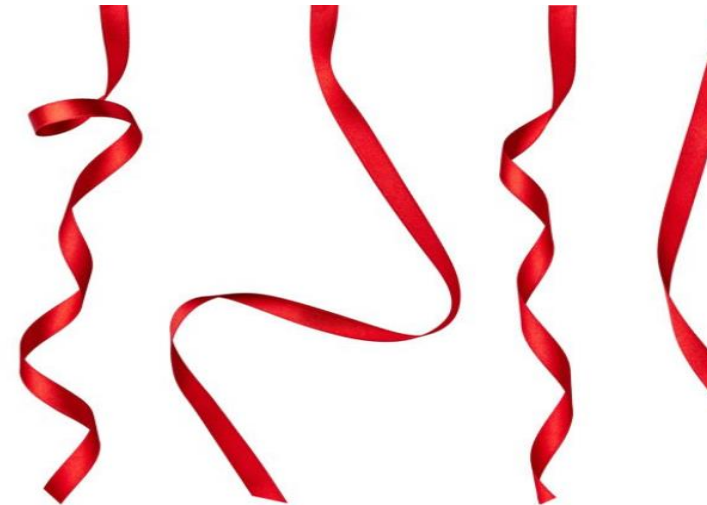
Congenital Aganglionic Megacolon/Hirschsprung Disease

Assessment

- **Liquid or *ribbon-like stools***
- Distended abdomen from stool impaction
- Nausea, vomiting, anorexia, lethargy, weight loss, and failure to thrive
- Look for signs and symptoms of enterocolitis, volvulus, and shock, which can occur from this condition

Intervention

- Barium studies and biopsy of large intestines to confirm condition
- Surgery to bypass the affected area or a resection of the aganglionic portion





Imperforate Anus

Imperforate Anus Introduction

The absence or abnormal opening; may have no anal opening onto the skin wall, or the rectum may end in a blind pouch



A fistula to the vagina in females or to the urethra in males may be present

Imperforate Anus

Assessment

- Assess for signs and symptoms of impaction from the inability to pass stool
- Measure abdominal girth to evaluate abdominal distention
- **Do not take temperature rectally**

Intervention

- Surgical reconstruction or dilation
- Post-Op reconstruction of the anus and the formation of a temporary colostomy, keep the infant prone with the hips elevated
- Keep site clean



Appendicitis

Appendicitis Introduction



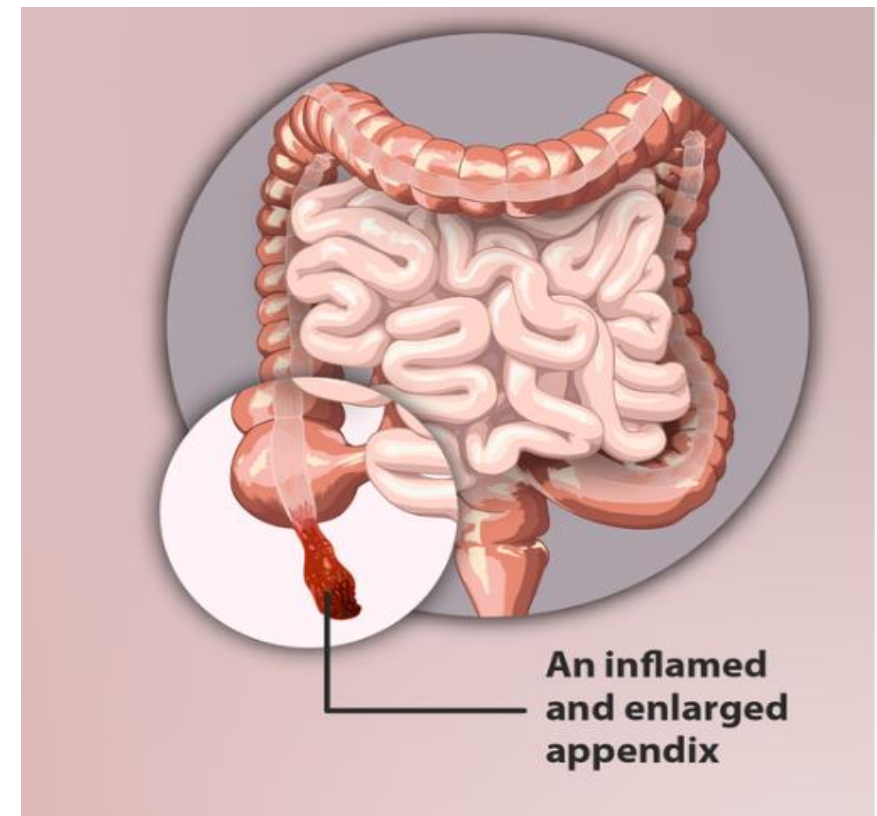
Inflammation and obstruction of the blind sac at the end of the cecum; this results in ischemia, gangrene, perforation, and peritonitis



Causes: Infection or obstruction

Appendicitis Assessment

- Symptoms vary making an accurate diagnosis difficult
- **Assess for abdominal pain and tenderness that begins as diffuse, then confines in the lower right quadrant: McBurney's Point**
- **Look for symptoms of peritonitis if rupture occurs (fever, sudden relief of pain followed by a diffuse pain); this is a surgical emergency**



[File:Depiction of a person suffering from Appendicitis.png - Wikimedia Commons](#)

Appendicitis Interventions

- Antibiotics
- Surgery (if required)
- Pain medications
- **Do not apply heat, as it may cause the appendix to rupture and lead to peritonitis**





IBD: Inflammatory Bowel Disease

IBD: Inflammatory Bowel Disease

- Crohn's disease and ulcerative colitis
- Diagnosed from results of a barium enema, biopsy of the GI mucosa, and stool studies
- Chronic exacerbation may delay growth and development; including sexual development



Inflammatory Bowel Disease

Crohn's

- Patchy lesions
- Some blood in stool
- Affects all layers of bowel
- Can occur in any portion of the GI tract

Ulcerative Colitis

- Connecting ulcers
- More blood in stool than Crohn's
- Attack on mucosa lining of bowel
- Involves large intestines

Assessment



Assess for weight loss, nausea, vomiting



Test stool for blood



Monitor for diarrhea



Test for anemia and signs of hypovolemia



Assess for pain

Interventions

Analgesics and
antispasmodics

Corticosteroids

Immunomodulators
(methotrexate and
cyclosporine)

Reduce stress

Parental nutrition

Colectomy,
ileostomy, or ileo-
anal pull through

A photograph of four children of diverse backgrounds smiling and looking off-camera in a bright, outdoor setting. The children are standing close together, with their arms around each other. The background is a soft-focus landscape with green grass and trees under a bright sky.

Celiac Disease

Celiac Disease Introduction

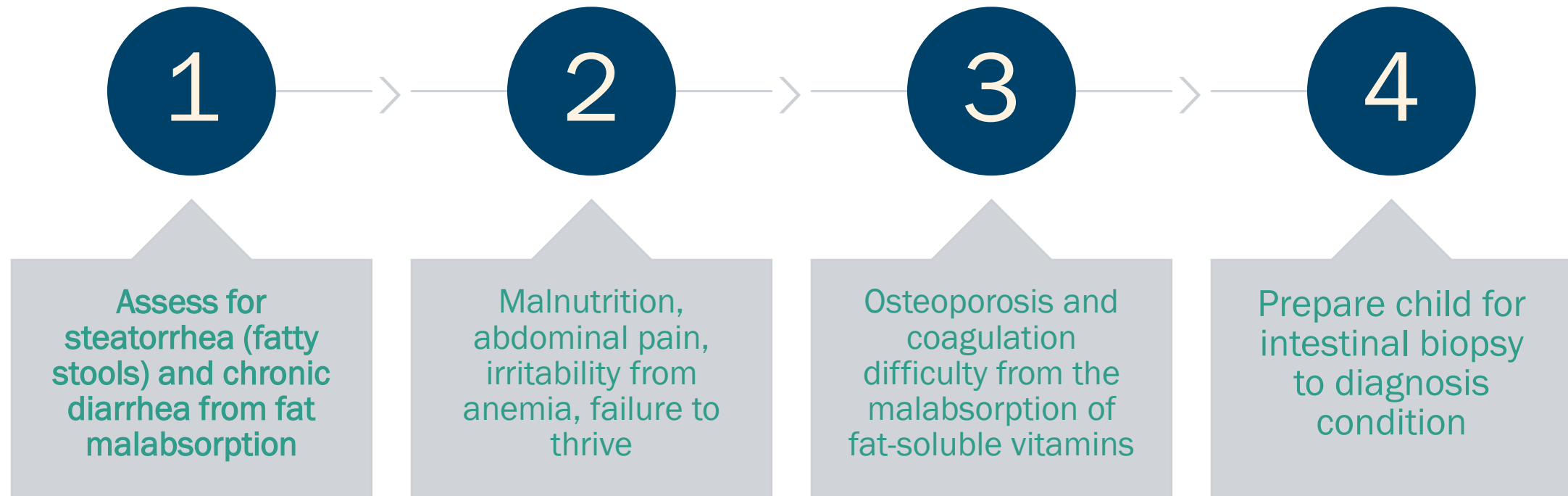


An absence of an enzyme in the intestinal mucosal cells and causes the villi of the proximal small intestine to atrophy and decreases intestinal absorption



The disease is a response to gluten intolerance (inability to absorb rye, oat, wheat, and barley glutens)

Celiac Disease Assessment



Celiac Disease Interventions

- **Eliminate gluten from diet**
- **Give corn and rice products, soy and potato flour, and all fresh fruit**
- Replace vitamins and calories; give small frequent meals



[Free of Charge Creative Commons gluten free diet](#)
[Image - Highway Signs 3](#)





Necrotizing Enterocolitis

Necrotizing Enterocolitis (NEC) Introduction

Blood flow to the GI tract is compromised as oxygenated blood is diverted to the brain and heart

Bowel mucosa becomes necrotic= decreased protective mucus

Common in premature infants

Gas-forming bacteria attack the necrotic tissue in bowel

Formula feedings may worsen the condition, because food promotes a nutritional base for bacteria to grow

Necrotizing Enterocolitis (NEC) Assessment

- Abdominal distention
- Lethargy
- **Monitor for an increase in gastric residual/vomiting**
- **Check stool for blood and sugar**
- Check abdominal x-ray and /or ultrasound for increased GI gas
- Daily abdominal girth measurements



Necrotizing Enterocolitis (NEC) Interventions

Bowel rest/NPO

TPN

NG tube to low
suction

Antibiotics

Possibility of
colostomy



Biliary Atresia

Biliary Atresia Introduction

The absence of extrahepatic biliary structures



Bile is unable to drain from liver to small intestines



Unknown cause



The congenital anomaly can cause liver failure or death

Biliary Atresia Assessment



Jaundice early in infancy, pruritis (itching), irritability



Dark urine from hyperbilirubinemia and pale stools from the absence of bile

Biliary Atresia Interventions

- **Fat-Soluble Vitamins (A, D, E, and K) in water-miscible form**
- Surgery (the Kasai procedure) is done to form a substitute duct; this is a temporary 'fix' until a liver transplantation can be done





Parasitic Worms

Parasitic Worms Introduction

- Acquired through skin, ingesting dirt or raw vegetables with helminth eggs
- Eggs hatch and travel to GI tract where they thrive
- Caused by unsanitary disposal of stool and poor handwashing
- **Pinworm** → most common and live in cecum and migrate to anus at night to lay eggs in perianal area. Tape test!



Parasitic Worms

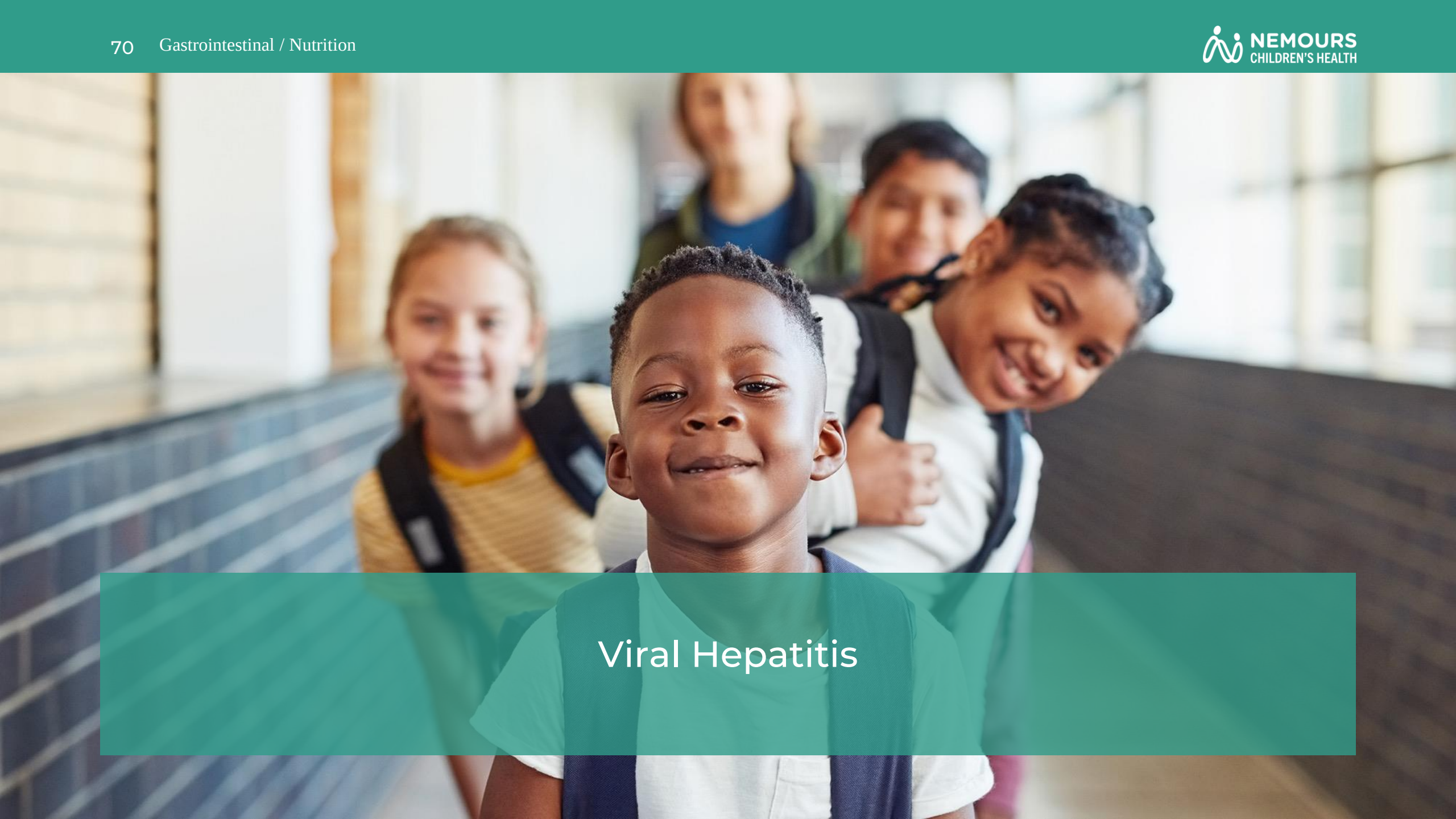
Assessment

- Bloody diarrhea
- Failure to thrive
- Abdominal distention
- Anorexia, nausea, vomiting
- Intense pruritis and scratching

Interventions

- Education on sanitary stool disposal techniques
- Handwashing
- Wash fruits and veggies before eating
- Administer medications for infestations





Viral Hepatitis

Viral Hepatitis Introduction

Hepatitis = inflammation in the liver

Diagnosed by identifying the antigenic markers with body's immune response

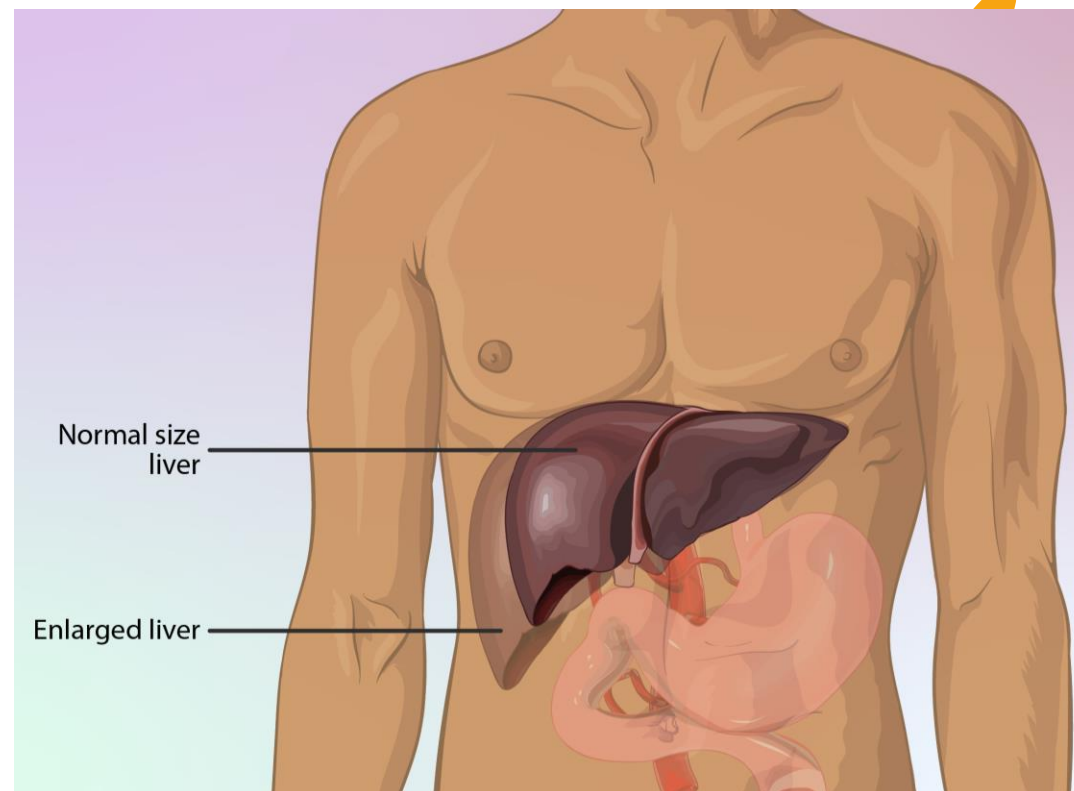
Hepatitis A: Passed via fecal-oral route

Hepatitis B: Passed on by blood & body fluids

Hepatitis C: Spread parenterally

Hepatitis D: Occurs along with hepatitis B

Hepatitis E: Spreads like hepatitis A



File:Depiction of an enlarged liver.png - Wikimedia Commons

Hepatitis Assessment

Anorexia

Nausea/vomiting

Right upper
quadrant pain

Jaundice

Dark urine

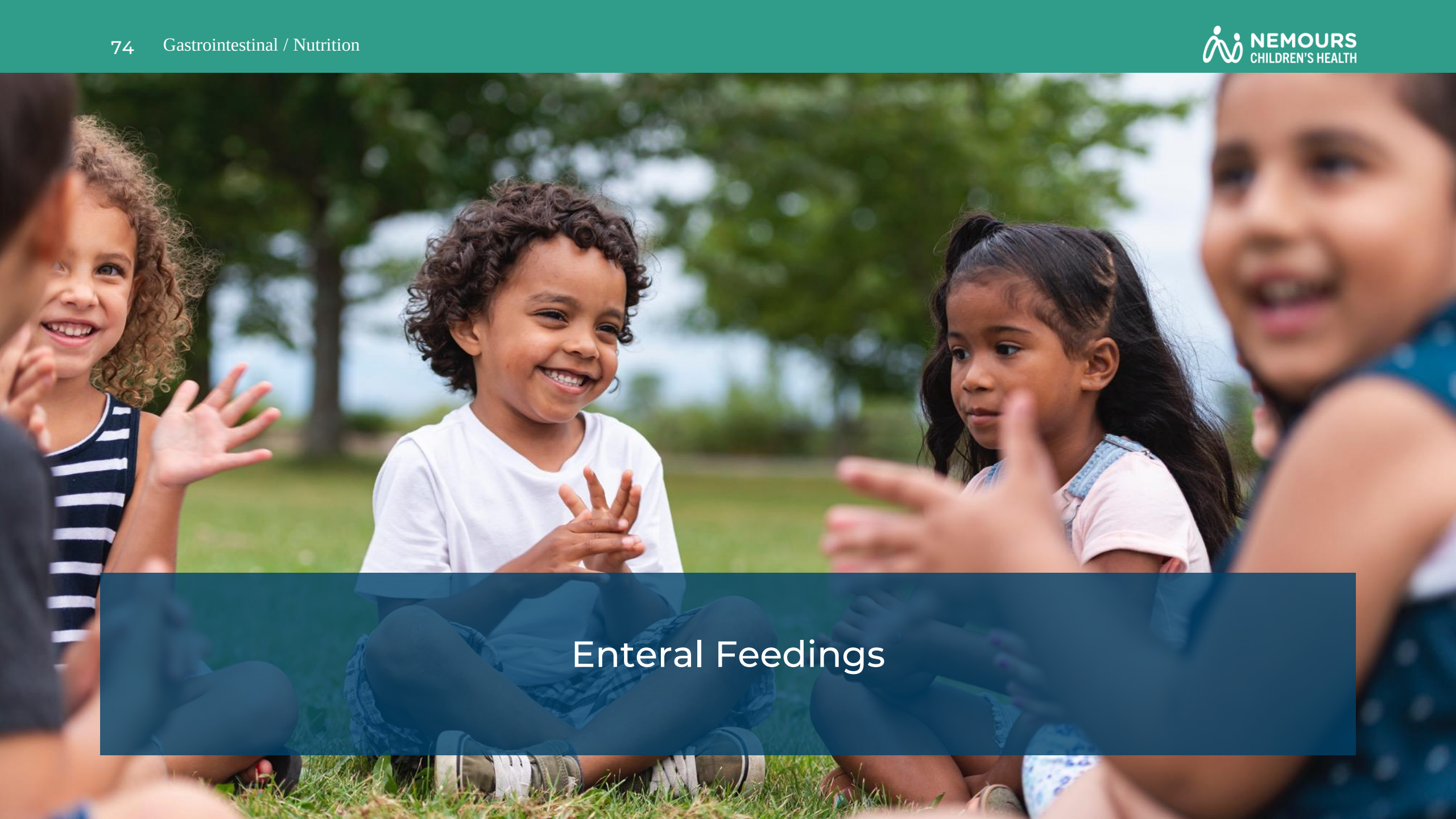
Pale stools

Liver function
tests

Hepatitis Interventions

- Administer hepatitis immunoglobulin (HBIG) for hepatitis B contact
- Immunization series
- **Good handwashing and hygienic environments!**
- Promote rest, fluids and good nutrition

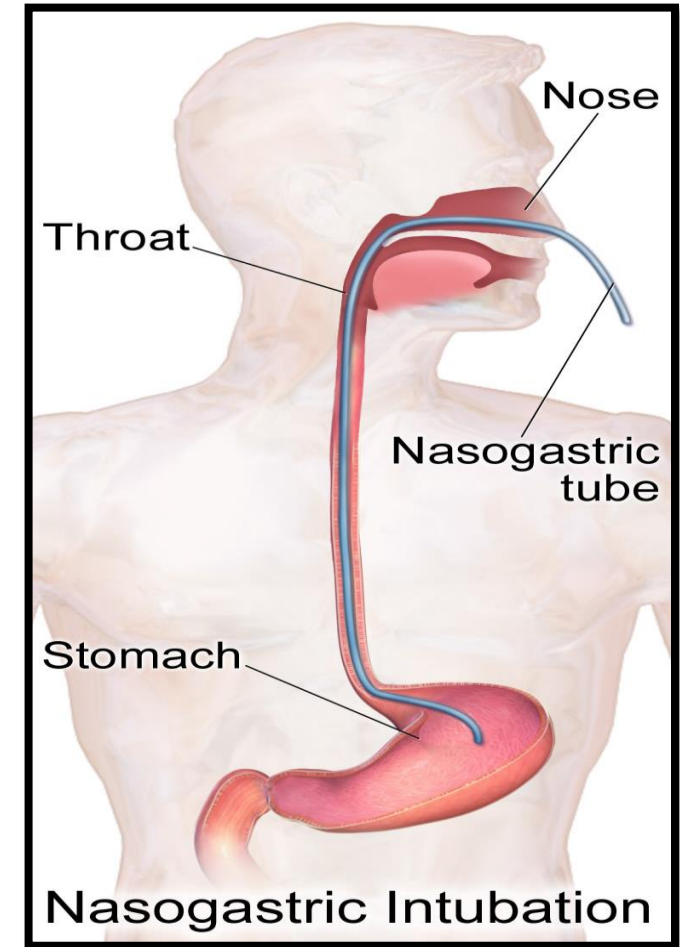


A photograph of four diverse young children sitting on a grassy lawn outdoors. They are all smiling and clapping their hands. The child in the center is a young boy with curly hair wearing a white t-shirt. To his left is a girl with curly hair in a striped shirt. To his right is a girl with long dark hair in a pink shirt. On the far right, another girl is partially visible, also smiling. The background shows green trees and a clear sky. A semi-transparent dark blue rectangle is overlaid at the bottom of the image, containing the text 'Enteral Feedings' in white.

Enteral Feedings

Enteral Feedings

- Feedings delivered directly into the stomach or intestines by either naso-gastric tube, naso-jejunal tube, or a gastrostomy tube
- Feeds can be intermittent or continuous and delivered by pump or gravity



[File:Nasogastric Intubation.png - Wikimedia Commons](#)

Enteral Feedings



File:Medical X-Ray imaging DAP03 nevit.jpg - Wikimedia Commons

When inserting an enteral tube, if resistance is encountered, withdraw the tube and try again; use of force can cause perforation

pH testing of aspirate is the most reliable way to verify placement; secondary to an Xray.

NG tubes can stiffen when left in place too long and cause mucosal irritation

pH should be <5 or <6 if on an H2 blocker



Acetaminophen Therapeutic Dosing and Poisoning

Acetaminophen (Tylenol) Dosing and Poisoning

- Analgesic & antipyretic
- Does not inhibit platelet aggregation and does not affect inflammation like aspirin
- **Appropriate dosing is 10-15mg/kg/dose**



Acetaminophen Assessment and Intervention

Assess for GI distress, such as nausea, vomiting, diarrhea, and abdominal pain



Monitor for liver damage 24-26 hours after the overdose



Antidote: acetylcysteine (Mucomyst)



Let's Check Your Knowledge!

Knowledge Check: Question 1

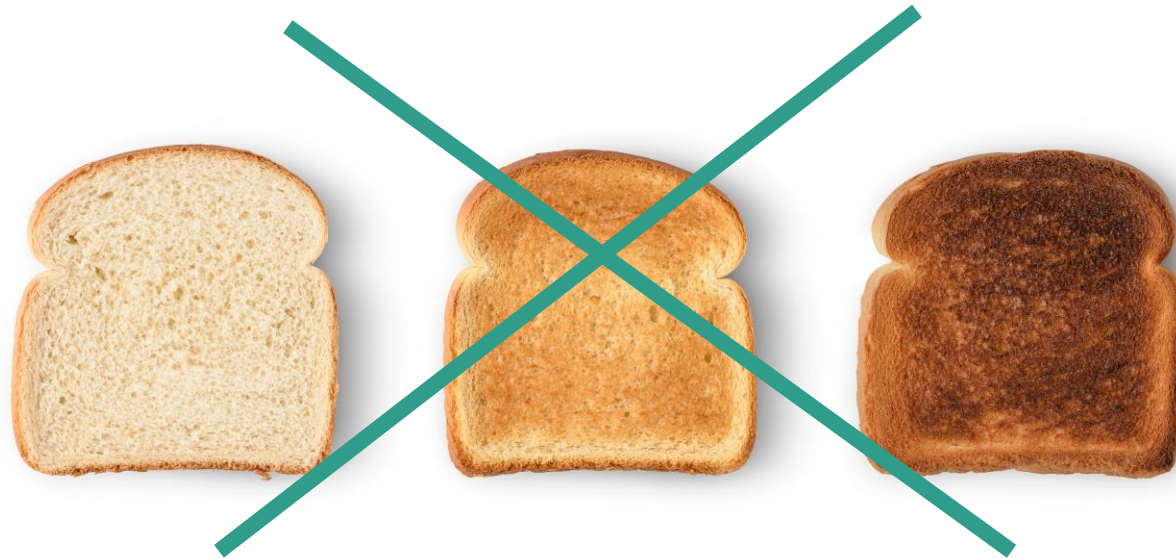
True or False:

The BRAT diet is recommended for children suffering from diarrhea.



Knowledge Check: Question 1

- False → BRAT diet is NOT recommended due to lack of protein



Knowledge Check: Question 2

When is surgery scheduled for a child with a cleft palate?

- A.) Right after birth
- B.) Before 1 year of age
- C.) After 1 year of age
- D.) Never; it will close on its own



Knowledge Check: Question 2

C.) Before 1 year of age

- This allows the growth of the palate and before the baby begins to develop speech; prevent speech delays



Knowledge Check: Question 3



Which best describes the stool from a child who has been diagnosed with intussusception?

- A.) Diarrhea
- B.) Hard and dry
- C.) Ribbon-like stool
- D.) Red currant, jelly-like stool

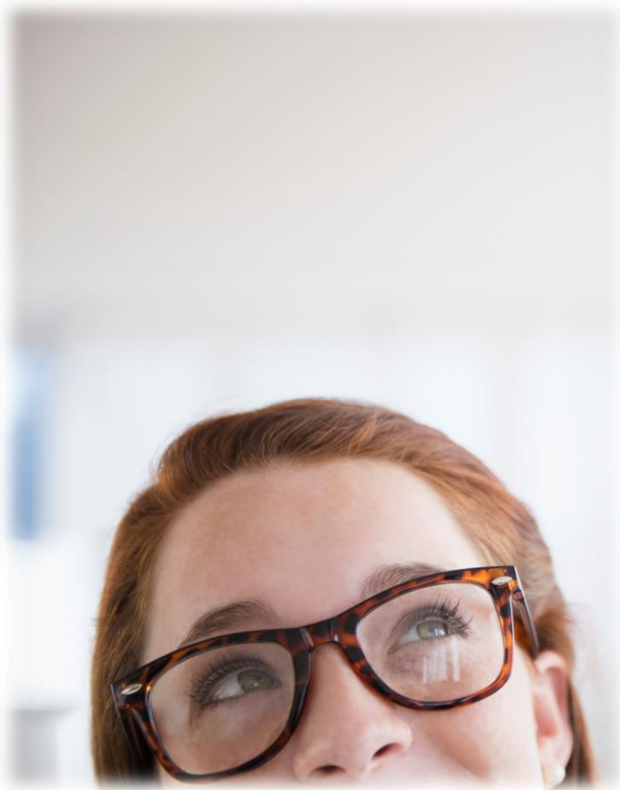
Knowledge Check: Question 3

D.) Red currant, jelly-like stool

- Red due to blood/tissue sloughing and jelly-like due to the mucus



Knowledge Check: Question 4



Your patient has a gluten-free diet due to a diagnosis of Celiac Disease. Which of the following would you want to remove from their meal tray?

- A.) Cheeseburger on bun
- B.) Corn
- C.) Banana
- D.) Eggs

Knowledge Check: Question 4

A.) Cheeseburger on bun

- Cheeseburger due to the gluten within the bun



Knowledge Check: Question 5

Which of the following would you NOT observe in an infant with biliary atresia?

- A.) Pruritis
- B.) Pale stool
- C.) Jaundice
- D.) Low oxygen levels



Knowledge Check: Question 5

D.) Low oxygen levels

- Low oxygen levels do not relate to biliary atresia



Thank you and good luck!



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