PRACTICE TOOL

Enteral Nutrition Gastrointestinal Intolerance: Issues and Solutions

In hospitalized patients receiving enteral nutrition (EN), the actual delivery of EN often falls well below the prescribed amount and can be referred to as persistent underfeeding (range of 51-58%).[1,2] This has been attributed to delays in feeding due to procedures, gastrointestinal (GI) intolerance, aspiration concerns, or comorbid medical conditions.[3] Persistent underfeeding is associated with ongoing malnutrition, impaired immune response, poor wound healing, increased mortality, increased length of hospital stay, and as a result, higher total cost of care.[4] Of those factors that contribute to this decrease in delivery, GI intolerance can be addressed through careful evaluation. The purpose of this practice tool is to review GI intolerance issues and provide solutions.

Photo Source: Kate Farms. Patient photo used with permission.

The Importance of a Definition and Thorough Evaluation and Assessment

Consider discussing the definition(s) of diarrhea and constipation with your teams. If you don't have a department-wide accepted definition of diarrhea and constipation, each clinician may have a varied idea of how these complications present in the clinical setting.

Confirm exactly what the family is doing vs. what is prescribed/recommended/ordered. Caregivers/patients/parents may repeat what the regimen is instead of explaining what they have been able to do over the last 3 days. You can start by saying, "Walk me through a typical day of how the feedings are given and what symptoms happen and when they may happen" and remind them that there is no right or wrong answer, as you're their partner in figuring out the best enteral nutrition regimen.

Monitoring

After initiation of the EN, the clinician should monitor the safety of EN, the advancement of the feedings, and the GI tolerance of the prescribed EN regimen. The EN plan must be adjusted as needed to prevent complications and achieve nutrition goals.[5] The underfeeding and subsequent malnutrition may be extended by how many times the formula needs to be changed due to intolerances before one is found to be optimally tolerated.

Gastrointestinal Challenges[5-7]

GI Complication	Contributing Factors	Prevention/Treatment Strategies
Nausea and vomiting	• Delayed gastric emptying • Sepsis • Medications • Rapid formula infusion • Cold formula • Formula fat content • Improper tube placement • Overfeeding	• Provide anti-emetic medications • Use prokinetic agents to increase gastric motility • Adjust medications that delay gastric emptying • Consider fat content of formula and/or modulars • Provide a lower fat formula and/or isotonic formula • Administer formula and water flushes at room temperature • Reduce enteral feeding rate or extend infusion time of intermittent feeding
Gastrointestinal reflux	• Delayed gastric emptying • Medications • Formulas	• Elevate the head of the bed at least 30 degrees • Change formula delivery from intermittent to continuous • Use prokinetic agents to increase gastric motility • Consider delivery of formula to post-pyloric location • Change formula to blenderized tube feeding

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Gastrointestinal Challenges[5-7] *(continued)*

GI Complication	Contributing Factors	Prevention/Treatment Strategies
Abdominal distention/ bloating	• Ileus • Bowel obstruction • Constipation • Ascites due to underlying condition • Diarrheal illness • Formula issues such as cold formula, rapid administration, or initially in those containing fiber	• Discontinue or hold EN with ileus or obstruction • Bowel regimen • Diarrhea workup and treatment • Deliver room temperature formula • Decrease rate temporarily • Monitor tolerance fiber containing formula advancement • Advance fiber containing formulas slowly • Consider venting or gastric decompression
Maldigestion and malabsorption (fat or mucous in stool)	• Impaired breakdown of nutrients and defective mucosal uptake and transport of nutrients • Causes include nutrient allergies, gluten-sensitive enteropathy, inflammatory bowel disease, radiation enteritis, pancreatic insufficiency, short bowel syndrome, among others	• Conduct maldigestion and malabsorption workup • Provide vitamin and mineral supplementation as needed • Select formula based on medical condition • Consider use of peptide-based and altered lipid formulas
Diarrhea	• Sorbitol containing medications or those with a high osmolality • Infections, illness severity, and disease states • Possible microbial contamination of formula • Enteral formula issues such as osmolality, fiber, and fat content • Mode of EN delivery • Tube migration/improper tube placement	• Adjust medications that have GI effects • Dilute hyperosmolar medications or change dosage form • Identify and treat conditions and infections contributing to diarrhea • Use clean, aseptic technique with formula delivery • Use sterile liquid formulas over powder, reconstituted formulas • Limit hang time • Adjust fiber type and amount • Consider isotonic formula or slower rate • Consider alternate formula such as peptide-based formula, blenderized feeding formula, or one higher in medium chain triglycerides • Consider continuous vs. bolus feeding delivery • Administer anti-diarrheal medications once an infectious etiology has been ruled out
Constipation	• Medications • Insufficient fluid or fiber intake • Lack of physical activity • Variety of medical conditions	• Adjust medications that decrease GI motility • Provide adequate free water • Use fiber-containing formulas if no contraindication • Increase physical activity as able

Enteral Administration and Monitoring Techniques to Improve Formula Delivery

- **Use of gastric residual volume (GRV):** Use of GRV monitoring at times leads to holding feedings. It is recommended to discontinue GRV monitoring in ICU patients. In sites which continue the practice of GRV measurement, it is suggested that feedings be held only when the GRV is more than 500 mLs.[7,8]
- **Use volume-based feeding protocols:** Volume-based feeding focuses on the total amount prescribed over a 24-hour period and the rate is adjusted to meet the volume which offsets feeding gaps when the patient leaves the unit. Several studies have found volume-based feeding to be well tolerated by patients and superior in achieving nutritional goals.[3,9]

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Pediatric Considerations

- **Appropriate feeding volumes:**
  - The volume of feeds may be decreased through the provision of continuous feeds or smaller, more frequent feeds in addition to adjusting caloric density.
  - Modulars can be used as needed to add calories without increasing the volume of feeds. Note: caloric concentrations should be adjusted slowly and the patient should be monitored for signs of tolerance. Remember to make one change at a time, (example: either caloric density or volume) and work with the parent/caregiver/patient to create a step-wise approach to the changes in regimen to manage intolerance, if needed.
- **Poor Weight Gain:** Intolerance may lead to consistent failure to meet calorie/protein goals which impacts the ability to meet interval growth goals.

Home Care Considerations

In the home setting, switching the formula or adjusting the patient's ordered regimen can be challenging. It is important to efficiently and systematically rule out contributing causes of GI intolerance. Consider the pros/cons of the different methods of administration (continuous, overnight, frequency and volume of a bolus/syringe, gravity bolus, etc.) as intolerance can be related to this. It is recommended to make just one change at a time when adjusting enteral feedings. Use the following flowchart to evaluate the common GI intolerance of constipation or diarrhea.

Constipation/Diarrhea

1st Consideration

Are fluid needs being met consistently?

Is the caregiver/patient describing "constipation" and "diarrhea" as hard bowel movements or loose stools as a single vs. ongoing event?

2nd Consideration

If the patient is having multiple, frequent diarrhea/loose stools for more than 3 days or has gone multiple days without a bowel movement, and medications, fluid, and infections have been ruled out as the cause.

3rd Consideration

- Consider trialing another formula, and if able, trial before having to switch the homecare order to make sure the switch appropriately remedies the GI intolerance symptoms.
- If using a dairy-based formula, consider a non-dairy protein-based or a peptide-based formula.
- Consider a blended formula if the patient has already been using a fiber-containing formulation, as blended formulations will contain higher fiber content.

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