

Enteral Nutrition in the Hospital

Hospitalized patients who are not able to eat for extended periods require an alternative source of nutrition that can be provided in both enteral (intestinal) and parenteral (non-intestinal) liquid forms. This pocket card provides an overview of enteral nutrition.

What is enteral nutrition? (Seres, 2024a)

Enteral nutrition provides the necessary calories, protein, electrolytes, vitamins, minerals, trace elements, and fluids via an intestinal route. Enteral nutrition is a liquid formula that is delivered via an orogastric or nasogastric tube to the stomach (gastric feeding) or a distal (post-pyloric) part of the gastrointestinal (GI) tract (e.g., duodenum). Enteral nutrition can also be administered through percutaneous endoscopic gastrostomy (PEG), percutaneous radiologic gastrostomy, and surgical gastrostomy tubes.

There are a variety of enteral formulas designed to provide 100 percent of the recommended nutritional requirements needed by critically ill patients. The daily amount of enteral nutrition is individualized based on the caloric and fluid needs of the patient.

Clinical Indications for Enteral Nutrition (Lippincott Procedures, 2022)

- Inability to eat normally due to dysphagia
- Oral or esophageal obstruction
- Recovery from GI surgery
- Injury
- Endotracheal intubation
- Unconsciousness

Note: Enteral feedings may be safely administered to patients requiring prone positioning. Nasal bridles should be used to secure the feeding tube (Seres, 2024a).

General Parameters for Initiation of Enteral Nutrition (Seres, 2024b)

- The goal is to begin enteral nutrition within 48 to 72 hours of admission into the intensive care unit (ICU).
- Continuous infusion is generally preferred over bolus feeding to decrease the risk of vomiting, reflux, and aspiration.
- Initial calorie goal is between 18 and 25 kcal/kg/day.
- Initiate tube feed infusion at a rate that is 30-50% of the target goal and gradually increase over 3 to 7 days until the target rate is reached. However, consult your facilities' specific policies and the prescribed order when initiating enteral feedings.
- Standard formulation of enteral nutrition is recommended. Exceptions include the following:
 - Patients requiring volume restriction may benefit from concentrated formulas.

- Patients with renal failure complicated by fluid and electrolyte abnormalities may benefit from both concentrated and electrolyte-restricted formulas.
- Patients who don't tolerate the standard formulation may benefit from predigested enteral nutrition.

Contraindications to Enteral Nutrition (Lippincott Procedures, 2022; Seres 2024a)

- Suspected bowel obstruction
- Upper GI bleeding
- Unmanageable vomiting and diarrhea
- Severe hemodynamic instability
- Gastrointestinal ischemia
- High-output fistula

Initiating Enteral Nutrition (Lippincott Procedures, 2022)

- Verify the order: route, feeding device, formula, administration method, volume, rate, and frequency of water flushes.
 - Compare the enteral feeding label with the order in the medical record.
 - Check the expiration date on the label.
 - Review the medical record to ensure the enteral tube placement has been confirmed via x-ray.
- Allow the enteral formula to warm to room temperature before administering, as this can decrease the risk of diarrhea.
- Verify enteral tube placement by at least two of the following methods:
 - The marking on the enteral tube where it exits the patient's nose should be noted once the placement has been verified by x-ray. Check for tube migration (movement of the marking) before beginning tube feedings.
 - Check routine chest and abdominal x-ray reports.
 - Aspirate to confirm the presence of gastric contents with an enteral syringe.
 - Assess the aspirate. Fasting gastric secretions appear light green, brown, or clear and colorless.
 - Check for a change in the volume of aspirate from the feeding tube. An inability to withdraw fluid may indicate the gastric tube slipped back into the esophagus.
 - Per your facility protocol, measure the pH of the aspirate from the enteral feeding tube. Fasting gastric pH is five or less.
- If you think the enteral tube has moved out of proper position, don't start the feeding. Notify the practitioner immediately. An x-ray will be needed to verify the tube location.
- Label the container and administration set with the date and time that it was first hung.
- Position the patient's head of bed at 30 degrees to prevent aspiration.

Monitoring Enteral Nutrition Administration (Lippincott Procedures, 2022)

- If the feeding is ordered to run continuously, flush the feeding tube every 4 hours with 30 mL of water, as ordered and tolerated, to ensure patency and provide hydration.
- Assess for GI tolerance of enteral tube feedings every 4 hours.
 - Check for abdominal distention.
 - Monitor for abdominal pain.
 - Assess for passage of flatus and bowel movements.
- Measure gastric residual volume (GRV) per your facility policy and practitioner orders (Yasuda et al., 2019).
 - GRV is used to assess feeding intolerance (FI) and gastric emptying.
 - GRV is measured either by aspirating the enteral tube using a syringe or by gravity drainage into a reservoir.
 - GRV may not be used routinely to monitor critical care patients receiving enteral nutrition.
 - In other patient care areas that monitor GRV, avoid holding the enteral tube feeding for a GRV of less than 500 mL if there are no other signs of feeding intolerance.
- Monitor the patient's weight, fluid, electrolyte, and metabolic status to assess the effectiveness of the enteral tube feedings.

Preventing Infection (Lippincott Procedures, 2022)

- Change the enteral administration set per the manufacturer's instructions to inhibit bacterial growth.
- If the feeding container used is not sterile, only pour a 4-hour volume of formula into the feeding bag to limit the risk of bacteria growth.
- Discard enteral formula that isn't used within 24 hours.
- At home, patients should use a new enteral feeding bag each day.

Complications of Enteral Nutrition (Lippincott Procedures, 2022; Seres, 2024b)

- Irritation, infection, or necrosis of the esophageal, tracheal, nasal, or oropharyngeal mucosa
- Abdominal bloating and distention
- Dehydration
- Diarrhea
- Vomiting
- Feeding intolerance (e.g., glycosuria, cramping)
- Aspiration
- Fluid and electrolyte imbalances
- Constipation
- Hyperglycemia

- Refeeding syndrome: a potentially fatal condition marked by hypophosphatemia, cardiovascular collapse, respiratory failure, rhabdomyolysis, seizures, and delirium.

Documentation of Enteral Nutrition (Lippincott Procedures, 2022)

- Date and time of enteral feeding administration
- Type and volume of formula
- Volume of water given
- GI assessment
- Enteral tube exit site care
- GRV (if used)
- Verification of enteral tube placement
- Patient's tolerance of feeding
- Hydration status
- Medications administered through the enteral tube
- Date and time of enteral administration set changed
- Oral care
- Enteral tube feeding issues
- Patient and family education

References

Lippincott Procedures (2022, November 28). Enteral tube feeding, gastric. *Lippincott Solutions*.
<https://procedures.lww.com/lnp/view.do?pld=859175&hits=enteral%2Centerally%2Cnutrition&a=true&ad=false&q=enteral+nutrition>

Seres, D. (2024a, September 5). Nutrition support in critically ill patients: Initial evaluation and prescription. *UpToDate*.
<https://www.uptodate.com/contents/nutrition-support-in-critically-ill-patients-an-overview>

Seres, D. (2024b, September 3). Nutrition support in critically ill patients: Enteral nutrition. *UpToDate*.
<https://www.uptodate.com/contents/nutrition-support-in-critically-ill-patients-enteral-nutrition>

Yasuda, H., Kondo, N., Yamamoto, R., Asami, S., Abe, T., Tsujimoto, H., Tsujimoto, Y., & Kataoka, Y. (2019). Monitoring of gastric residual volume during enteral nutrition. *The Cochrane Database of Systematic Reviews*, 2019(5), CD013335.
<https://doi.org/10.1002/14651858.CD013335>