



## Management of Gastric Residuals

*BQIS Fact Sheets provide a general overview on topics important to supporting an individual's health and safety and to improving their quality of life. This document provides general information on the topic and is not intended to replace team assessment, decision-making, or medical advice. This Fact Sheet is one of ten regarding aspiration prevention.*

### Intended Outcomes

Readers will gain an understanding of the need to measure residuals (the volume of food, fluid remaining in the stomach at a point in time during enteral tube nutrition feeding) and how this practice contributes to the overall prevention of aspiration (occurs when a person inhales a foreign substance into his lungs. Possibilities include food, drink, and medications. In some cases, however, it is mucus that causes this problem, and a person may even aspirate saliva).

### Definitions

**Bolus Feeding:** A set amount of feeding usually delivered four (4) to eight (8) times per day, with each feeding lasting about 15 to 30 minutes.

**Continuous Feeding:** Drip feeding that may be delivered without interruption for an unlimited period of time each day. It is best to limit feeding to 18 hours or less, or as ordered by the physician.

**Gastric Residual:** Food, liquid, or material from a previous feeding left in the stomach at the start of the next feeding.

### Facts

- Assessing for the rate of gastric emptying (how quickly food and fluid leave the stomach) is a major nursing responsibility to prevent aspiration in persons who receive nutrition through tubes. This is done by measuring the amount of gastric (stomach) contents at regular intervals during continuous tube feedings or prior to each intermittent feeding.
- High gastric residual volumes (GRV) or the volume of food or fluid remaining in the stomach at a point in time during enteral tube nutrition feeding, increase the risk for pulmonary aspiration (the most severe complication of tube feedings).
- Excessive accumulation of feeding formula and gastric secretions causes distention (bloating in the stomach) and greatly increases the potential for regurgitation (the ejecting of material from the throat, or esophagus (food tube), usually with the presence of undigested food or blood) and vomiting, with subsequent aspiration of the gastric contents into the lungs.



- The risk for potential aspiration from a massively distended stomach is much greater than the risk of a clogged, improperly handled tube.
- Risk factors most commonly associated with aspiration in persons who are tube fed are:
  - Depressed level of consciousness
  - Lying flat in bed
  - Impaired cough or gag reflex
  - Vomiting, regurgitation, and reflux (stomach acid coming up from the stomach into the esophagus (food tube).
  - Inadequate gastric (stomach) emptying
  - Increased GRV
- It is necessary for the team to meet with the physician and discuss the parameters that will be implemented in the individual's specific environment. Factors such as stomach size, skeletal integrity, and formation, and past history should be considered.

### Recommended Actions and Prevention Strategies

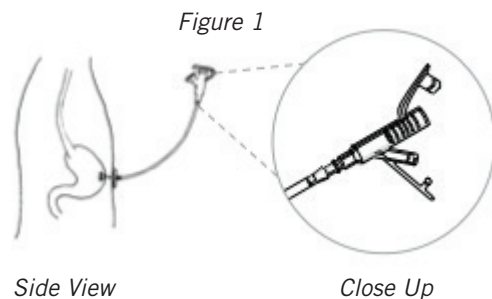
1. Monitor for excessive GRV in continuously fed persons:
  - a. GRV should be checked every 4-6 hours and feedings held for one (1) hour if the GRV is 1.5 times the hourly rate, or as directed, then rechecked at a predetermined time.
  - b. For a GRV that continues to exceed 1.5 times the hourly rate, the feeding should be held, a gastrointestinal evaluation performed, and the physician should be notified.
2. Monitor for excessive GRV in intermittently fed persons:
  - a. GRV should be checked prior to each administration and *held one (1) hour* for a GRV greater than 100 mls.
  - b. Feedings should be discontinued and the physician should be notified if the GRV is still *greater than 100 mls after a one-hour recheck*. If the GRV is below 100 mls, feeding may be resumed.
3. Elevate the head of the bed, as determined to be appropriate for the individual. Current research findings indicate that it is reasonable to elevate the head of the bed 30-45 degrees to minimize the risk of aspiration. However, this should be individualized, as not everyone may be able to achieve this degree of elevation.

4. Implement elevation of the individual to the degree determined to be appropriate not only during feedings, but during all aspects of the individual's daily routine.
5. Remember, most or all of the measured residual fluid should be replaced into the patient's stomach to prevent fluid, electrolyte, and nutrient loss.
6. Perform tube placement checks prior to bolus feedings, or at least every eight (8) hours if continuous feeding, as tubes can be dislodged or migrate.
7. Follow agency protocol for administering tube feedings and competency-based training.

### Types of Devices

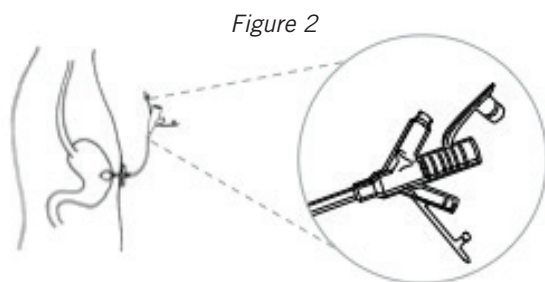
**Percutaneous endoscopic gastrostomy (PEG):** The first gastrostomy tube placed in surgery. It has one (1) or two (2) ports and a plastic bumper inside the stomach to secure it.

Figure 1 shows the side view and a close up of the PEG.



**Gastrostomy tube (or "G-tube"):** has two (2) or three (3) ports, and a balloon filled with water inside the stomach to secure it. It is placed after the PEG is removed.

Figure 2 shows the G-tube; notice the differences in the ports as compared to the PEG.



**Skin-level gastrostomy tube (or “button”):** This device lies flat against the skin and has a balloon inside the stomach. This device is sometimes called a “MICK-EY,” which is a brand name. An adapter tube called an extension set has two (2) or three (3) ports and is used to give the feedings and medicines.

Figure 3 indicates an example of an extension set for a skin-level gastrostomy.

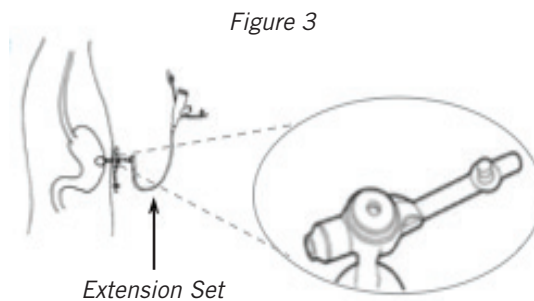
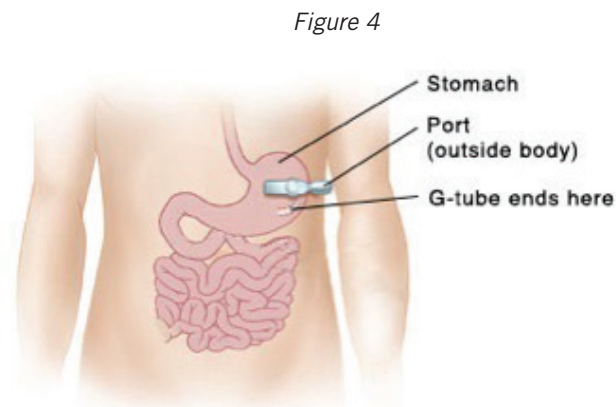


Figure 4 shows a port located outside of the body to attach tube feeding.





## Learning Assessment

The following questions can be used to verify a person's competency regarding the material contained in this Fact Sheet:

1. Risk factors commonly associated with aspiration in individuals who are tube fed include:
  - A. High level of alertness
  - B. Decreased level of consciousness
  - C. Lying flat in bed
  - D. Both B and C
2. True or False: An excessive accumulation of feeding formula and gastric secretions causes distention and greatly increases the potential for regurgitation and vomiting.
3. True or False: Bolus feedings may be delivered without interruption for an unlimited period of time each day.
4. True or False: Head of bed elevation is only important during or right after a feeding is administered.

## References

Johnson, A. D. (2009). Assessing Gastric Residual Volumes. *American Association of Critical-Care Nurses*, 29(5), 72-73. Retrieved 06/15/15 from <http://ccn.aacnjournals.org/content/29/5/72.full.pdf>.

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Methany, N. A., Schallom, L., Oliver, D. A., Clouse, R. E. (2008). Gastric Residual Volume and Aspiration in Critically Ill Patients Receiving Gastric Feedings. *American Journal of Critical Care*, 6, 512-520. Retrieved 06/15/15 from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2627559/>.



## Related Resources

Aspiration Prevention Series Fact Sheets: *Food Texture and Fluid Consistency Modification, Management of Constipation, Management of Oral Health, Dysphagia, Modified Barium Swallow Study/Videofluoroscopy, Management of Gastroesophageal Reflux Disease (GERD), Positioning, Feeding Tubes and Feeding/Medication Administration Options, and Choice Considerations Relevant to the Use of Enteral Nutrition*

*General Description of Diet Textures* Handout

These resources can be located on the BQIS Fact Sheet & Reminders webpage at:  
<http://www.in.gov/fssa/ddrs/3948.htm>.

## Learning Assessment Answers

1. D
2. True
3. False
4. False