



## VERIFICATION OF FEEDING TUBE PLACEMENT

### Expected Practice:

- Obtain radiographic confirmation of correct tube placement on all critically ill patients who are to receive feedings or medications via blindly inserted gastric or small bowel tubes prior to initial use.
- Mark and document the tube's exit site from the nose or mouth immediately after radiographic confirmation of correct tube placement; observe the mark to assess for a change in length of the external portion of the tube.
- Use bedside techniques to assess tube location at regular intervals to determine if the tube has remained in its intended position. No one single technique has been shown to be reliable for continually assessing tube placement:
  - Review routine chest and abdominal x-rays to determine if they refer to tube location
  - Helpful bedside techniques include measuring the pH and observing the appearance of fluid withdrawn from the tube.
  - Do not rely on the auscultatory method to determine tube location.

### Supporting Evidence:

- Radiographic confirmation is the only reliable method to date of confirming enteral tube placement. The pH and appearance of an aspirate from the newly inserted tube, while not 100% reliable, are highly suggestive of gastric or small bowel placement and can be used as an initial indicator of placement. However, radiographic confirmation should always be done.
  - An aspirate from a gastric tube often has a pH of 5 or less and is usually grassy-green or clear and colorless, with off-white to tan mucus shreds. <sup>(1-10)</sup>
  - An aspirate from a small bowel tube often has a pH of 6 or greater and is usually bile-stained (ranging in color from light to golden yellow or brownish-green). In addition, the aspirate is usually thicker and more translucent than fluid withdrawn from a gastric tube. <sup>(1-10)</sup>
  - An aspirate from a tube inadvertently positioned in the tracheobronchial tree or the pleural space typically has a pH of 6 or greater. An aspirate from a tube in the tracheobronchial tree usually has the appearance of fluid obtained during tracheal suctioning. An aspirate from a tube in the pleural space is usually straw-colored and watery, perhaps tinged with bright-red blood (caused by perforation of the pleura by the tube). <sup>(1-10)</sup>
- There are numerous anecdotal reports of blindly-inserted tubes entering the respiratory tract undetected. In most of these cases, the auscultatory method falsely assured that the tube was correctly positioned in the stomach. <sup>(11-16)</sup> There is also a report of the auscultatory method failing to detect inadvertent placement of a nasogastric tube in the brain. <sup>(17)</sup> The auscultatory method was found to have a sensitivity of only 34% in differentiating between gastric and small bowel tube placement in 85 acutely ill adults. <sup>(18)</sup> In another study auscultation for insufflated air was found to have a sensitivity of only 45% in determining whether 134 tube insertions resulted in placement above or below the diaphragm. <sup>(19)</sup>
- It is not uncommon for a feeding tube to dislocate from its intended site, either after being tugged at by a confused patient or during the delivery of care. <sup>(20,21)</sup> An increase in the external portion of tubing extending from the nose or mouth can signal that the tube's distal tip has dislocated upward in the gastrointestinal tract (such as from the small bowel into the stomach or esophagus, or from the stomach into the esophagus). <sup>(22)</sup>
- Measuring the pH of fluid aspirated from tubes of *fasting* patients is helpful in differentiating between gastric and respiratory placement, and gastric and small bowel placement. <sup>(1-7)</sup>
- Observing the appearance of fluid aspirated from tubes of *fasting* patients is helpful in differentiating between gastric and respiratory placement, and gastric and small bowel placement. <sup>(7-10)</sup>

- Observing the pH and appearance of aspirates from feeding tubes when continuous feedings are in progress is less helpful than when the patient is fasting; nonetheless, these methods are occasionally of benefit in distinguishing between gastric and small bowel tube location.<sup>(23)</sup>
- A sudden increase in residual volume from a feeding tube in the small bowel may signal upward displacement of the tube into the stomach. Aspirates from small-bowel feeding tubes are usually less than 10 ml; an increase to 50 ml or higher may signal upward displacement of the tube into the stomach.<sup>(22)</sup>
- Injecting 30 ml of air into the tube via a 60 ml syringe immediately before pulling back on the plunger facilitates the withdrawal of fluid from small-diameter tubes.<sup>(24)</sup>
- Flushing the tube with 30 ml of water (or normal saline, if indicated for patients with hyponatremia) after residual volume measurements prevents the tube from clogging.<sup>(25, 26)</sup>

### What You Should Do:

- Obtain an x-ray that visualizes the newly inserted tube to ensure that it is in the desired position (either the stomach or small bowel) before administering formula or medications via the tube for the first time.
- Ensure that your critical care unit has written practice documents such as a policy, procedure or standard of care that include when the initial x-ray should be obtained, a method of marking the feeding tube, where to document the exit site, and the frequency of the documentation.
- If documentation of tube placement is not currently a part of the routine interpretation of chest and/or abdominal x-rays, form a collaborative team including a radiologist, pulmonologist, staff nurse, and risk manager to develop strategies for implementing this practice.

### Need More Information of Help?

- Talk with a clinical practice specialist for additional information / assistance at [www.aacn.org](http://www.aacn.org) then select PRN.

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