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Carol M. McGinnis, Pat Worthington and Linda M. Lord

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Nasogastric Versus Feeding Tubes in Critically Ill Patients



When should nasogastric tubes be changed to feeding tubes?

A Carol M. McGinnis, MS, CNS, CNSN, Pat Worthington, RN, MSN, CNSC, and Linda M. Lord, LMNP, MSN, CNSN, reply:

A convincing body of evidence linking improved outcomes to the use of enteral nutrition in critically ill patients has dramatically increased the use of feeding tubes in critical care. In the past, enteral feeding

was not started until bowel sounds were audible, but current guidelines recommend starting enteral feeding as soon as the patient is hemodynamically stable, typically within 24 to 48 hours of admission to critical care.^{1,2} Although enteral feeding is without question the preferred route for providing nutritional support for critically ill patients, many questions concerning the most appropriate type of tube and the optimal location of the tip of the tube remain unanswered.

Factors related to the patient's clinical status and treatment often present challenges to achieving and maintaining safe enteral access. In particular, numerous factors can impair gastric motility, including medications (eg, opioids, dopamine, propofol, and acid-reducing agents), hyperglycemia, hemodynamic instability, and sepsis.³ To minimize the potential for gastric distention and reflux, large-bore suction tubes are often used for decompression. The question of when to exchange a large-bore suction tube for a small-bore feeding tube is a common clinical dilemma.

Terminology regarding enteral tubes varies from institution to institution. Tubes used for evacuation or

suctioning of stomach content may be fairly stiff and intended for short-term use or they may be more flexible. They are often referred to by brand name, such as "Levine" or "Salem Sump" or simply as an NG (nasogastric) tube. Small-bore feeding tubes may be called "Dobhoff" or "Corpak" as opposed to a generic term. Some are placed via the oral cavity instead of the nares for patients who are intubated for ventilation purposes. For clarity, generic terminology is used here. When origin and termination of the tube is important for clinical reasons, the name should be more specific to reflect this, for example, nasojejunal. Of note, a dual-lumen tube exists with access to both the stomach and the small intestine. Placement of this tube may be via the nares or mouth (not to be confused with a gastrojejunal tube). Because of its intended dual function, this tube is larger in external diameter than other tubes, and obtaining ideal placement may be challenging.

Critical care nurses may deliberate about the best choice for the feeding tube, where the tip should terminate, when to change from the nasogastric (NG) suction tube to a feeding tube, or perhaps how long to use both tubes simultaneously. With the increased frequency with

Authors

Carol M. McGinnis is a clinical nurse specialist with a nutrition/metabolic focus at Sanford USD Medical Center in Sioux Falls, South Dakota.

Pat Worthington is a nutrition support clinical specialist at Thomas Jefferson University Hospital in Philadelphia, Pennsylvania.

Linda M. Lord is a nurse practitioner specializing in nutrition support at the University of Rochester Medical Center in Rochester, New York.

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which nurses are able to obtain access to the small bowel, the question may be raised whether gastric feeding should be tried or if small-bowel access is desired. According to the Guidelines for the Provision and Assessment of Nutrition Support Therapy in the Adult Critically Ill Patient from the Society of Critical Care Medicine and the American Society for Parenteral and Enteral Nutrition (ASPEN),¹ use of the small bowel for enteral feedings in intensive care patients is not required unless gastric feeding intolerance is present. These guidelines suggest that the selection of an enteral access device be based on patient-specific factors such as disease state, current anatomy, gastric and intestinal motility, and estimated length of therapy. Guidelines issued by ASPEN recommend use of a large-bore suction tube for the first 1 or 2 days of enteral feeding² (when present), monitoring tolerance.

Gastric residual volumes (GRVs) have traditionally been used to determine tolerance to feeding and the potential for aspiration. Current recommendations for management of high GRVs vary, with feedings withheld for volumes ranging from 150 to 500 mL. Elevated GRVs can indicate worsening clinical status when considered in combination with other factors such as abdominal distention and/or firmness, vomiting, sepsis, or the need for pressor agents.^{4,6} Despite the lack of

consensus regarding the interpretation of GRVs, researchers agree that a single elevated measurement does not constitute a reason to stop feeding, emphasizing instead the need to evaluate trends in GRVs. ASPEN guidelines state that if the GRV remains at 250 mL or greater after a second residual check, implementing strategies to enhance gastric emptying, including use of prokinetic agents and narcotic antagonists, may promote feeding tolerance.² However, when GRVs remain persistently elevated, placement of a postpyloric tube may be indicated.

In some cases, tube feeding may be successful when administered in conjunction with simultaneous gastric decompression, with a large-bore tube in the stomach and a feeding tube terminating in the small intestine. Obtaining small-bowel access with a suction tube in place may be aided by partial temporary retraction of the suction tube to help the person inserting the tube feel the advancement of the tube and provide access via the pylorus if the suction tube tip is partially obstructing it. The potential for success of gastric feeding should be weighed in terms of degree of trauma, medications, and other treatments including the ability to keep the head of the bed raised (or in reverse Trendelenberg position), or if specific therapies, such as placing the patient prone, are being used. Small-bowel feedings are most appropriate for patients with gastric outlet obstruction, gastroparesis, pancreatitis, and for patients with known reflux and aspiration of gastric contents.²

With both a suction tube and a feeding tube, the feeding may be advanced to the goal rate in a

reasonable period and the suction tube can be removed when no longer indicated. The decision regarding when the suction tube is no longer needed is patient specific and most likely depends on factors such as gastrointestinal motility and whether cessation of suction via the tube is tolerated.

Various factors influence the ability to measure residual volume via an enteral tube, such as termination of the tube tip in the distal vs the proximal part of the stomach, having multiple ports on the internal aspect of the tube for aspiration, position of the patient, method of aspiration of contents, and size of the tube.^{7,8} Metheny et al⁹ found that GRVs obtained from large-diameter (14F-18F) suction tubes were about 1.5 times greater than GRVs obtained from 10F small-bore tubes. Yet many who work with small-bore feeding tubes often obtain large GRVs. One author can attest to a report of 1100-mL returns with wall suction in a short period via an 8F Corpak feeding tube in a patient who refused to have an NG placed for abdominal distention, as his existing feeding tube was the only tube he would permit. Selection of enteral tubes may depend on what is stocked in the supply area and may not take into consideration the patient's size and needs. The small patient with a mild ileus may not need the larger bore tube that may be thought necessary for another patient.

The decision to exchange a large-bore suction tube with a small-bore feeding tube must be made in light of the patient's overall clinical condition and the potential benefit to the patient. Factors such as recent



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gastrointestinal or esophageal surgery, the presence of a hiatal hernia or other altered upper gastrointestinal anatomy may present challenges to tube replacement.

Other considerations that play a role in the decision-making process include concerns for patients' comfort and the potential for mucosal trauma and epistaxis from tube insertion versus adverse effects from an existing large-bore tube. Additional staff time is involved with tube reinsertion as well as the need for verification of placement. According to several authors, evidence indicating that larger tubes are associated with higher rates of reflux and aspiration is inconclusive.^{10,11} Therefore, a prudent course of action may sometimes be to continue using the large-bore suction tube for feeding in clinical situations where the risks associated with tube insertion are high, at least temporarily.

Regulatory factors may also influence selection of specific feeding tubes. The state of New York has enacted legislation regarding tube selection. New York State Public Health Law¹² states:

To minimize patient discomfort, nasogastric tubes used for patient feeding purposes shall:

- i) be the smallest gauge appropriate for the patient and shall not exceed 3.96 millimeters (#12 French) in outside diameter unless medically indicated;
- ii) be made of a soft, flexible material such as medical grade polyurethane or silicone; and
- iii) be specifically manufactured for nasogastric feeding purposes.

Additionally, patients are to be evaluated periodically for the ability to return to normal feeding function or whether a percutaneous (ie, gastrostomy or jejunostomy) tube should be placed.¹² In the critical care setting, the discussion about whether a longer term tube may be implicated should occur if another surgical procedure such as a tracheostomy is being planned and if need is anticipated for more than 4 weeks.²

It is often the critical care nurse who makes product suggestions as well as recommendations for changes in the patient's plan of care. There are principles to help guide practice, as discussed earlier, yet decisions also should be patient specific. The risks of potential damage from the existing tube and risks associated with changing any tube must be balanced against the benefit of the smaller feeding tube. Efficacy, safety, and comfort should be guiding principles in making these choices. The adage that is often asked, "What would I want for my loved one?" may guide caregivers in many areas, including this one. **CCN**

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