American Society of Anesthesiologists™

Recommendations on preprocedural fasting in hospitalized patients who receive tube feeding

American Society of Anesthesiologists Committee on Critical Care Medicine

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Figure 1. Rationale for recommendations: preventable periprocedural starvation in hospitalized patients who receive tube feeding.

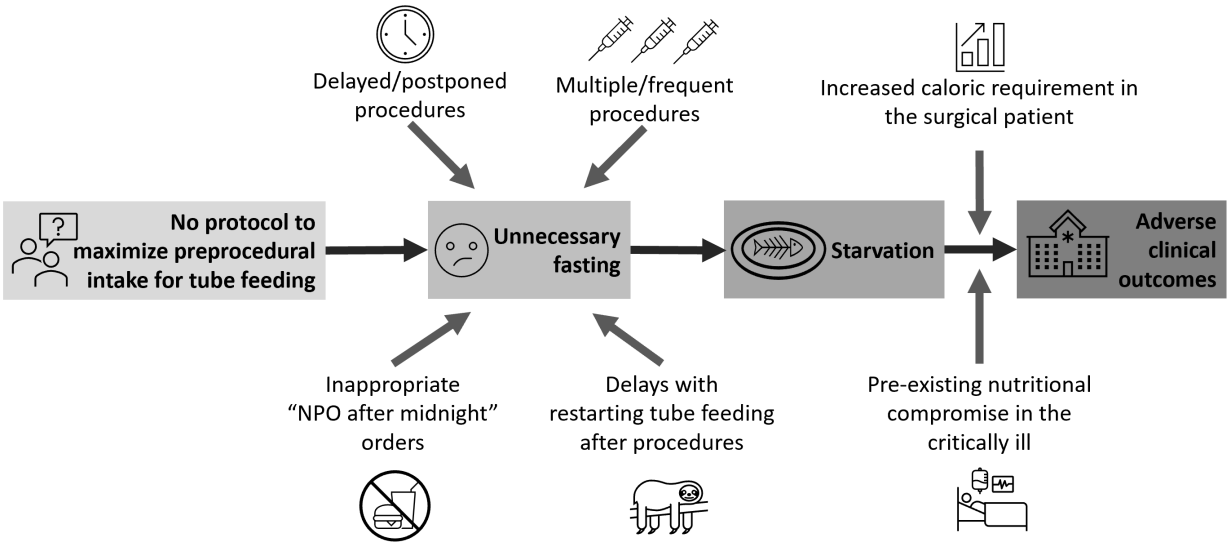

Table 1. Summary of recommended exceptions to the conventional preprocedural fasting times* in patients who receive tube feeding.

Airway	Endotracheal or cuffed tracheostomy tube	Natural airway
Patient location	Hospitalized§	
Procedure	Non-GI tract, non-lung, non-airway	
Intraoperative position	Supine, non-Trendelenburg, non-reverse Trendelenburg	
Feeding tube	Gastric or postpyloric	Postpyloric†
Type of tube feeding	Continuous	
When to stop feeding	Upon transfer to the OR‡	2 hours prior to procedure
Suction after feeding stopped#	Yes	Not required
Special considerations	Consider gastric ultrasound in cases with uncertain fasting and/or gastric emptying	

** Conventional fasting times as recommended by the American Society of Anesthesiologists (Anesthesiology 2017; 126:376)*
§ Hospitalized in the ICU or medical/surgical floor
† Surgically placed or confirmed radiologically within 48 hours prior to surgery
‡ Consider uninterrupted perioperative tube feeding in patients with an endotracheal or cuffed tracheostomy tube, especially in patients with high nutritional needs such as burn patients
 # If allowed by tube design and diameter, unless planning for uninterrupted perioperative feeding
Abbreviations: ICU – intensive care unit; GI – gastrointestinal; OR – operating room.

Background

Avoiding long periods of preprocedural fasting is a key aspect of periprocedural care,[1] particularly in mechanically ventilated patients who cannot receive oral nutrition and require tube feeding. However, current guidelines on periprocedural care and nutrition in adult patients provide no recommendations on preprocedural fasting time for patients with or without a secure airway who receive tube feeding. Furthermore, widely used guidelines suggest that tube feeding can increase the likelihood of aspiration of gastric contents.[2]

The lack of clinical guidelines and suggestion of increased risk contribute to potentially unnecessary preprocedural discontinuation of tube feeding in up to 25% of patients.[3,4] Interruption of tube feeding is often aggravated by delays or cancellation of scheduled procedures - one in five of the scheduled procedures is delayed until the following day.[5] Such frequent and prolonged interruptions in tube feeding result in a clinically significant nutritional deficit.[5-7] Indeed, preprocedural discontinuation of tube feeding is associated with prolonged ICU and hospital stay (Figure 1).[4,7]

Although protocols to minimize the preprocedural nutritional gap in tube fed patients exist at the hospital level,[8] the lack of clinical evidence and societal guidelines promotes practice heterogeneity with potential exposure of some patients to unnecessary and harmful nutritional deficit (Figure 1).[9] These challenges in preprocedural fasting practices offer an opportunity for anesthesiologists to lead systems change to improve periprocedural metabolic and nutritional care.[10] In this document, members of the American Society of Anesthesiologists (ASA) Committee on Critical Care Medicine outline safe and acceptable fasting practices in critically ill and non-critically ill hospitalized patients who receive preprocedural tube feeding.

Goal

The ASA Committee on Critical Care Medicine aimed to develop a practical approach to preprocedural fasting of hospitalized patients who receive tube feeding. Our goal is to improve the long-term health and outcomes in this patient population by balancing the risk of aspiration of gastric contents with the risk of nutritional deficiency due to frequent fasting periods during a prolonged ICU or hospital stay.

Clinical evidence: safety

We did not conduct a systematic literature review/meta-analysis. However, studies identified by our literature search team and a call for relevant publications within the ASA Committee on Critical Care Medicine demonstrated that clinical evidence on periprocedural fasting in patients receiving tube feeding is limited. Prospective observational studies and small trials available to date focused on the feasibility of continuing tube feeding until transfer to the operating room but were not powered to accurately assess the safety of such an approach.[11-15] The largest identified prospective study reported no cases of aspiration of gastric contents among 46 patients who received feeding via a postpyloric tube until transfer to the operating room.[12] In a small randomized controlled trial (n = 24) of fasting for 6 hours *vs* 45 minutes prior to bedside open tracheostomy, the authors visually assessed the subglottic area and trachea for evidence of aspiration.[15] The latter study also reported no cases of aspiration of gastric contents or the blue dye that was administered into the stomach via feeding tube prior to surgery.

The largest identified retrospective studies were conducted in hundreds of intubated trauma ICU patients and addressed the safety of continued TF until transfer to the operating room as secondary outcomes.[6,7] These studies showed no evidence of increased risk of complications with ongoing tube feeding until transfer to the operating room and suggested a potential reduction in acute respiratory distress syndrome (ARDS) and pneumonia. One of these publications also reported a reduction in overall mortality after implementation of tube feeding until the time of procedure.[7] Other retrospective studies that were conducted in substantially smaller samples also did not identify an increased risk of complications with tube feeding until transfer to the operating room[16] or with uninterrupted perioperative tube feeding.[17]

Clinical evidence: nutritional goals

Identified literature demonstrates the benefits of continuing tube feeding until transfer to the operating room in terms of meeting nutritional goals. Both prospective and retrospective studies suggest that compared to patients who are fasting prior to procedures, patients who receive tube feeding until transfer to the operating room:

1. Receive substantially more calories and protein in the periprocedural period.[2,7,11,12,15]
2. Have substantially shorter periprocedural fasting time.[11,12,14,15]

Clinical experience

The cumulative clinical experience of the ASA Committee on Critical Care Medicine suggests that most patients with an advanced airway (endotracheal tube or cuffed tracheostomy tube) can be safely tube-fed until they are transferred to the operating room. This experience applies to patients with adequate gastrointestinal motility who undergo non-gastrointestinal tract, non-lung, non-airway surgery in the supine position. Our experience also indicates that in most patients without an advanced airway, who have a surgically placed or radiologically confirmed postpyloric feeding tube, two hours of preprocedural fasting is sufficient to minimize the risk of aspiration of gastric contents. Please refer to “Caveats to consider” for conditions where such an approach may not be safe.

Institutional protocols

Based on the feasibility data presented above, multiple institutions have implemented protocols that standardize management of pre- and periprocedural tube feeding. Examples of such protocols and a detailed summary of institutional practices can be found in a recent review publication.[8] This review identified eight institutional protocols which recommended one of the following management options in patients with protected airway who underwent qualifying procedures:

a. Tube feeding until transfer/call to the operating room
b. Uninterrupted perioperative tube feeding

Some institutional protocols that are available online provide options for preprocedural management of tube feeding in patients with a natural airway. These protocols focus on patients who receive tube feeding via a postpyloric tube and, similarly to the abovementioned protocols, recommend:

a. Tube feeding until transfer to the operating room[18]

b. Uninterrupted perioperative tube feeding[19]

Recommendations

The ASA Committee on Critical Care Medicine recognizes the paucity of adequately powered studies focusing on intraprocedural safety and postprocedural outcomes in patients who receive preprocedural tube feeding. We highlight the need for such studies to inform clinical care and development of practice guidelines. However, based on the Committee's cumulative clinical experience, we make the following recommendations (Table 1).

For institutions:

1. Develop and implement protocols for preprocedural or periprocedural tube feeding to establish uniformly acceptable practices.

For individual clinicians:

1. Minimize "NPO after midnight" orders to avoid unnecessary interruptions in nutrient delivery.
2. In hospitalized patients with a protected airway (cuffed endotracheal tube or cuffed tracheostomy tube) who undergo non-gastrointestinal tract, non-lung, non-airway surgery in the supine position (non-Trendelenburg, non-reverse Trendelenburg), continue tube feeding until departure to the operating room.
    - If feeding tube permits suctioning, suction the stomach/bowel contents prior to transferring to the operating room (unless planning for uninterrupted perioperative tube feeding).
    - Consider uninterrupted perioperative tube feeding, including tube feeding during the procedure, especially in patients with high nutritional needs such as burn patients.
4. In patients with a natural airway who have a surgically placed or radiologically confirmed (within 48 hours prior to surgery) postpyloric feeding tube, continue tube feeding until two hours prior to transferring to the operating room.
    - If, in addition to a postpyloric feeding tube, a patient has a gastric tube or a gastric port of a combined tube, suction gastric contents prior to transferring to the operating room.
5. Consider ultrasonographic assessment of gastric volume in cases with uncertain fasting time and/or gastric emptying.

Caveats to consider

The recommendations presented above do NOT apply to:

- Patients with major impairment of gastrointestinal motility or significant structural disease of the gastrointestinal tract. In such patients, duration of preprocedural fasting should be determined on a case-by-case basis, following a discussion with the surgical or intensive care teams. *Examples of such conditions include:*
    - *gastroparesis*
    - *bowel obstruction*

  - *ileus*
  - *compromised lower esophageal sphincter*
  - *gastrointestinal bleeding*
- Non-hospitalized patients, since the risk of holding tube feeding is likely lower in non-hospitalized patients receiving tube feeding.
- Patients receiving bolus tube feeding. Data is lacking to guide preoperative fasting in bolus tube feeding.
- Patients who will be extubated after surgery.
- Surgical positions other than supine and level.

Restarting tube feeding after the procedure

Although the timing of restarting tube feeding after the procedure is outside the scope of this document, we encourage early initiation of feeding and nutritional catch up protocols to minimize the periprocedural nutritional gap. Please refer to specific protocols reported in the literature[6,8] and the overall approach to nutrition in surgery and critical illness outlined in the current guidelines.[1,20]

Conclusions

There is substantial potential for improvement of nutritional gap and, likely, clinical outcomes in tube fed patients who undergo procedures. Anesthesiologists should lead the efforts to minimize the nutritional gap in this patient population. Development and implementation of an institutional protocol for pre- or periprocedural management of tube feeding, based on existing protocols and feasibility evidence listed above, is a practical step towards establishing safe and acceptable fasting practices in patients who receive tube feeding and undergo procedures.

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