Nothing After Midnight?

The practice of restricting a patient's oral intake prior to surgery is almost as old as the discovery of anesthesia itself. Starting in the late 19th century with Sir Joseph Lister who permitted the consumption of "tea or beef tea," preoperative fasting instructions drastically changed following Mendelson's 1946 report in which 2 patients who ate full meals 6 to 8 hours prior to surgery died because of pulmonary aspiration during general anesthesia. The recommendation of "NPO after midnight" for liquids and solids soon followed to combat intraoperative vomiting and aspiration risks with little to no consideration of the individual patient's medical status or existing comorbidities. The American Society of Anesthesiologists (ASA) formally established evidence-based NPO guidelines in 1998, and virtually all anesthesia societies today have adopted some modest variation of the ASA's "2-4-6-8 rule." Healthy patients are permitted clear (nonparticulate) liquids up to 2 hours prior to surgery, breast milk for 4 hours, nonhuman milk and a light (nonfatty) meal up to 6 hours, and heavy (fatty) foods 8+ hours. Despite these contemporary fasting guidelines, the adage "nothing after midnight" seems to persist, resurfacing frequently during preoperative discussions with dental patients, their parents or caregivers, and even other health professionals and staff. Does continuing such outdated preoperative fasting instructions really make a difference? Conversely, are there times when prolonged fasting is appropriate?

The obvious need to confirm proper preoperative fasting goes without saying as anyone who has dealt with vomiting/aspiration during sedation or general anesthesia can attest. Managing perioperative pulmonary aspiration is daunting enough within the confines of a fully staffed traditional hospital operating room. Add in the relatively isolated nature of the dental clinic or oral surgeon's office and the difficulties mount exponentially. Patients presenting for treatment who fail to fast appropriately (eg, ate a full meal 2 hours prior) must be rescheduled—no ifs, ands, or buts. Failing to delay or reschedule such a case after its discovery puts the patient at significant risk for undue harm, and such a poor decision to proceed would be exceedingly difficult to defend.

To that end, implementing multiple check points throughout the preoperative period to double and triple check patient adherence to NPO instructions is strongly recommended. This process can easily start with the receptionist asking the patient upon their arrival when they last ate or drank, moving onward to include the dental assistant/nurse and finally the sedation or anesthesia provider as the last stop. This purposeful repetition may trigger a patient or parent to "fess up," uncovering a critical fasting violation. A classic example is the parent who felt the Reese's Peanut Butter Cups his child consumed while driving to the dental office were not food but rather candy and therefore fine to eat prior to general anesthesia. Equally frustrating was the mother disclosing she gave several full cups of ice to her child before arriving to the office because "it wasn't food or water, it was ice," and therefore fine to consume. In both examples, the front desk staff were told the patients had not consumed anything only to have the violation uncovered by the attentive nurse. Staff should be encouraged to speak up if a potential NPO violation is at all suspected, like the patient who presents for treatment carrying a partially full Starbucks drink. These are "red flag" events that warrant further investigation prior to proceeding.

Although preoperative fasting is critical for patient safety, prolonged fasting should ideally be avoided when appropriate and possible as patients can develop irritability, dehydration, fatigue, drowsiness, and hypoglycemia, particularly in the pediatric population.[1] A patient who is inconsolable, crying, and irritated preoperatively is at a higher risk for developing emergence delirium postoperatively.[2,3] This can be especially difficult in the ambulatory dental environment as emergence delirium can delay recovery, mask postoperative complications, and negatively impact patient and parent satisfaction. Balkaya et al[4] assessed fasting times and emergence delirium in 110 pediatric patients undergoing magnetic resonance imaging with sedation. Weak positive correlations were found with emergence delirium and longer fasting times for solids (13.05 h vs 11.32 h) and fluids (11.42 h vs 10.38 h).[4] Khanna et al[2] reported a similar study on pediatric patients undergoing ophthalmic exams under anesthesia and found a positive correlation between clear fluid fasting times and increased emergence delirium scores during the early (up to 20 min) postoperative period. Additional advantages to minimizing extended fasting may include improved venous anatomy visualization, intravenous access, and intraoperative cardiovascular stability.

Although there are clear benefits to minimizing fasting times, providers should be cautious and selective in their application. Patients and parents/caregivers must fully comprehend not only the gravity of why NPO guidelines should be followed but also the

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particulars of the instructions themselves. To be thorough, written preoperative instructions should include fasting guidelines, which should be further discussed to ensure complete understanding. Simply stating "clear liquids ≥2 hours" can easily be misinterpreted and result in disaster. Consider instead clarifying exactly what liquid options are acceptable (eg, water, Sprite, nonparticulate apple juice) and which are not (eg, milk, orange juice with pulp). Furthermore, it may be beneficial to consider adding a modest time buffer in case schedules are adjusted, like permitting clear fluids up to 2.5 to 3 hours preoperatively. This can be quite useful for patients scheduled later in the morning or afternoon. Reaching out to patients the night before surgery to remind them once again of the need to present appropriately NPO is often quite helpful. Many patients prefer texting, which can be especially effective for communicating simple reminders these days. Regardless of the particulars, clear and concise communication is of the utmost importance when discussing fasting instructions with patients.

Many factors can influence the decision to prolong preoperative fasting times. Medical comorbidities that result in delayed gastric emptying (eg, diabetes mellitus) or lower esophageal sphincter tone warrant consideration for extending normal NPO recommendations to reduce elevated aspiration risks. Patient scheduling is another factor as unforeseen cancellations could prompt later cases to be unexpectedly moved up. This easily can create a situation where a patient originally scheduled for early afternoon is called in midmorning instead, unintentionally violating fasting instructions unless they were given extended NPO times in anticipation. Additionally, it may be considered prudent to stick to "nothing after midnight" if substantial concerns exist about a patient's ability to understand and comply with more contemporary guidelines. The benefits of recommending and ensuring prolonged fasting may outweigh the risks for these types of scenarios and should be assessed on a case-by-case basis.

Sedation and anesthesia providers for dentistry can certainly improve upon the old recommendations of "nothing after midnight" in most circumstances. Although the use of contemporary NPO guidelines benefits the general welfare of our patients, it does not come without risk if applied inappropriately or indiscriminately. Effective communication, establishing purposeful redundancies into preoperative routines, and creating efficient supportive team environments are keys to minimizing those risks and maximizing patient safety.

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REFERENCES

1. Klemetti S, Suominen T. Fasting in paediatric ambulatory surgery. *Int J Nurs Pract*. 2008;14(1):47–56. doi:10.1111/j.1440-172X.2007.00666.x
2. Khanna P, Saini K, Sinha R, Nisa N, Kumar S, Maitra S. Correlation between duration of preoperative fasting and emergence delirium in pediatric patients undergoing ophthalmic examination under anesthesia: a prospective observational study. *Paediatr Anaesth*. 2018;28(6):547–551. doi:10.1111/pan.13381
3. Özaltun F, Zengin SÜ, Orhon Ergün M, Çorman Dinçer P, Umuroğlu T. Determination of the relationship between postoperative delirium development and analgesia nociception index values in pediatric patients. 2022;14(2):113–119. doi:10.14744/iksstd.2021.54366
4. Balkaya AN, Yilmaz C, Baytar C, et al. Relationship between fasting times and emergence delirium in children undergoing magnetic resonance imaging under sedation. *Medicina (Kaunas)*. 2022;58(12):1861. doi:10.3390/medicina58121861