

# Moving Beyond “NPO at Midnight”

## Healthy Patient of Any Age

(i.e., not diabetic, obese, pregnant, ileus/SBO, difficult airway)

## Undergoing Elective Procedure

(i.e., not emergent)

## General or Regional Anesthesia

(i.e., not merely local anesthesia)

### Hours Pre-Op

### Allowable Food or Beverage

> 8

Heavy foods (fried/fatty) and meats

6

Light meal (e.g., toast + clear liquid)  
Cow's milk (in moderation)  
Infant formula



4

Breast milk

2

Non-alcoholic **clear liquids** (e.g., water, fruit juice without pulp, nutritional drinks, clear tea, black coffee)



0-2

NPO

## Benefits of Clear Liquids up to 2 hours Pre-Op

- ✓ LESS patient thirst and hunger
- ✓ LOWER risk of aspiration



# INFOGRAPHICS IN ANESTHESIOLOGY

Complex Information for Anesthesiologists Presented Quickly and Clearly

## NPO! Ready to Go?

Diabetes can cause gastroparesis and delayed gastric emptying. According to ASA fasting guidelines, patients with diabetes may require longer fasting intervals. In this issue, Perlas *et al.* used gastric ultrasound to evaluate residual gastric volume after standard fasting intervals before elective surgery in diabetic and nondiabetic patients.<sup>1</sup>

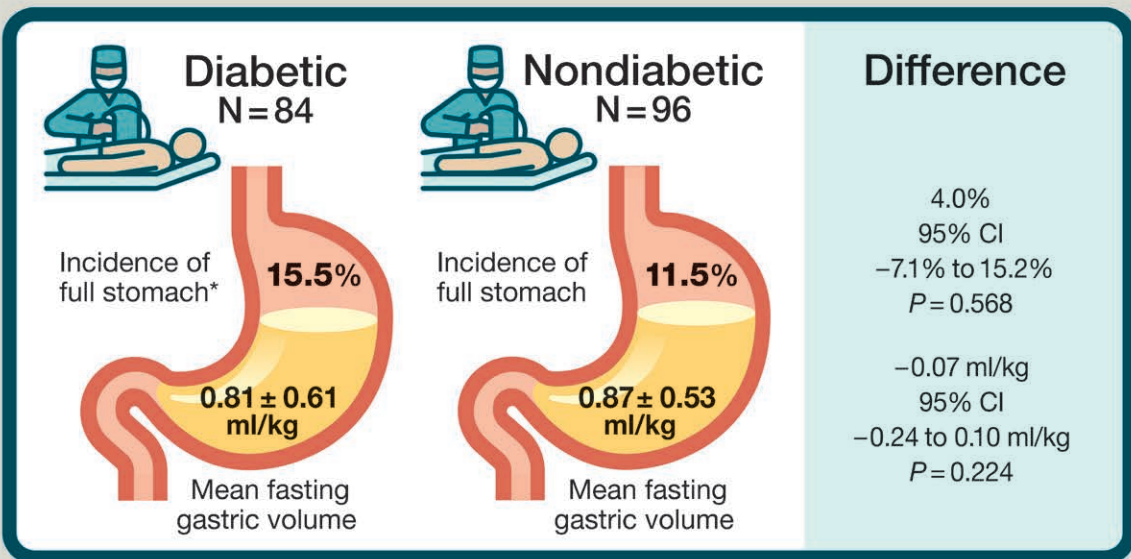
### Do Current Fasting Guidelines Ensure Empty Stomach in Diabetic Patients?

#### Inclusion:

- Age 18–85 yr old
- ASA Physical Status I–III
- BMI <40 kg/m<sup>2</sup>

#### Exclusion:

- Prior GI surgery
- Upper GI disease
- Pregnant



### Question for Future Study<sup>2</sup>



Does administration of glucagon-like peptide-1 (GLP-1) agonists affect safe fasting guidelines?

### Conclusion



Fasting guidelines are noninferior in diabetic patients compared to nondiabetic patients with BMI <40 kg/m<sup>2</sup>.

\*Full stomach defined as  $\geq 1.5$  mL/kg of fluid or solid in the stomach.

ASA, American Society of Anesthesiologists; BMI, body mass index; GI, gastrointestinal; NPO, *nil per os* (nothing by mouth).

Infographic created by Holly B. Ende, Vanderbilt University Medical Center, and Jonathan P. Wanderer, Vanderbilt University Medical Center. Illustration by Annemarie Johnson, Vivo Visuals Studio. Address correspondence to Dr. Ende: holly.ende@vumc.org.

1. Perlas A, Xiao MZX, Tomlinson G, et al.: Baseline gastric volume in fasting diabetic patients is not higher than that in nondiabetic patients: A cross-sectional noninferiority study. *ANESTHESIOLOGY* 2024; 140:648–56

2. Warner MA: Diabetic patients, assessment of preoperative gastric contents, and potential reduction of risk of pulmonary aspiration. *ANESTHESIOLOGY* 2024; 140:639–41

# Recommendations

2023 ASA UPDATE

Recommendation	Strength of Recommendation	Strength of Evidence
1. We recommend healthy adults* drink carbohydrate-containing clear liquids† until 2 h before elective procedures requiring general anesthesia, regional anesthesia, or procedural sedation. The carbohydrates may be simple or complex.	Strong	Moderate
2. There is insufficient evidence to recommend protein-containing clear liquids preferentially over other clear liquids before elective procedures requiring general anesthesia, regional anesthesia, or procedural sedation (no recommendation).	Not applicable	Very low
3. We suggest not delaying elective procedures requiring general anesthesia, regional anesthesia, or procedural sedation in healthy adults* who are chewing gum.‡	Conditional	Very low
4. There is insufficient evidence concerning benefits and harms to recommend pediatric patients drink clear liquids until 1 h <i>versus</i> 2 h before procedures with general anesthesia, regional anesthesia, or procedural sedation (no recommendation).	Not applicable	Very low
5. To avoid prolonged fasting in children, efforts should be made to allow clear liquids in children at low risk of aspiration as close to 2 h before procedures as possible. In children with shorter clear liquid fasting duration, exercise clinical judgment.	Best practice statement	Not applicable

\*Individuals without coexisting diseases or conditions that may increase the risk for aspiration, including esophageal disorders such as significant uncontrolled reflux disease, hiatal hernia, Zenker's diverticulum, achalasia, stricture, previous gastric surgery (for example, gastric bypass), gastroparesis, diabetes mellitus, opioid use, gastrointestinal obstruction or acute intraabdominal processes, pregnancy, obesity, and emergency procedures. Exercise clinical judgment with this patient population. †Up to 400 mL of clear liquids is considered an appropriate volume. Trial participants ingested a median of 400 mL of carbohydrate-containing clear liquids (interquartile range, 300 to 400 mL) up to 2 h before anesthesia administration. ‡Chewing gum should be removed before any sedative/anesthetic is administered.

Water and black coffee only remain for 20-30 minutes in stomach

**EJA**

*Eur J Anaesthesiol* 2016; **33**:457–462

**ORIGINAL ARTICLE**

## **Black or white coffee before anaesthesia?**

**CONCLUSION** The study provides evidence that adding up to 50% full fat milk to coffee leads to no or only a minimal increase of the gastric volume 2 h later. The results support a liberalization of policy on the addition of milk to hot drinks before planned anaesthesia.





# NPO Guidelines for Infants and Children

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## Key Points

- Pediatric preoperative fasting guidelines were developed to reduce the risk of pulmonary aspiration and the severity of pulmonary complications should aspiration occur.
- National guidelines recommend a “6-4-2” rule for preoperative fasting, meaning a minimum of 6-hour fast for solid food or formula, 4 hours for breast milk, and 2 hours for clear fluids.
- Recently updated recommendations encourage shorter actual fasting times while still allowing sufficient fasting times for safety.

## Introduction

- The goal of preoperative fasting recommendations is to reduce the risk of aspiration and the severity of pulmonary complications should aspiration occur.
- Most national guidelines recommend a “6-4-2” rule for preoperative fasting, meaning a minimum of 6-hour fast for solid food or formula, 4 hours for breast milk, and 2 hours for clear fluids.<sup>1,2</sup>
- In infants and children, these recommendations often result in actual fasting times that far exceed the safety margin and may result in hunger, thirst, and patient and caregiver distress.<sup>3</sup>
- There has been a shift in focus to minimal safe fasting times and encouraging intake up until that time.

## Solids and Nonhuman Milk

- The American Society of Anesthesiologists (ASA) practice guidelines on preoperative fasting<sup>1</sup>, as well as the European Society of Anaesthesiology and Intensive Care (ESA-IC) preoperative fasting guidelines in children,<sup>2</sup> recommend that solid food can be ingested until 6 hours before procedures requiring general anesthesia, regional anesthesia, or procedural sedation and analgesia.
- A meal of fried food, fatty food, or meat may require additional fasting times (e.g., 8 hours or more).
- While there is some evidence that 4 hours of fasting after a light meal is safe and well-tolerated in healthy children, there are no large studies confirming the lack of increase in aspiration rates, and the definition of a light meal may be a challenge to deliver and evaluate consistently.<sup>2</sup>

## Breast Milk and Formula

- The ASA practice guidelines recommend a 4-hour fasting period for breast milk and a 6-hour fasting period for formula before procedures requiring general anesthesia, regional anesthesia, or procedural sedation and analgesia.<sup>1</sup>
- The ESA-IC fasting guidelines recommend that breast feeding be encouraged until 3 hours prior to anesthesia.<sup>2</sup> This was based on 9 observational studies on gastric emptying after breast milk feeds in infants and young children. Their recommendations are the same (i.e., 3 hours) even for fortified breast milk.
- The ESA-IC fasting guidelines suggest that for infants, formula may be given safely up until 4 hours prior to anesthesia; however, larger studies are necessary to be confident of the safety in regard to aspiration.<sup>2</sup>

## Clear Fluids

- The ASA recommends that clear fluids may be ingested for up to 2 hours before elective procedures requiring general anesthesia, regional anesthesia, or procedural sedation and analgesia.<sup>1</sup>
- Institutions that have been using shorter clear fluid fast times of 1 hour, or even 0 hours, have shown no increased risk of aspiration with this more liberal clear fluid fasting times and have shown a marked decrease in actual fasting times.<sup>4,5</sup>
- This evidence has been shifting international consensus from a 2-hour to a more liberal 1-hour clear fluid fasting policy, which was proposed in a joint statement by the Association of Paediatric Anaesthetists of Great Britain and Ireland, the European

Society for Pediatric Anesthesiology, and the Association of French Speaking Paediatric Anaesthetists (ADARPEF).<sup>6</sup>

- This policy has been endorsed by the European Society of Anaesthesiology,<sup>2</sup> the Canadian Pediatric Anesthesia Society, and the Society for Pediatric Anaesthesia of New Zealand and Australia.
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## References

1. Practice guidelines for preoperative fasting and the use of pharmacologic agents to reduce the risk of pulmonary aspiration: Application to healthy patients undergoing elective procedures: an updated report by the American Society of Anesthesiologists Task Force on preoperative fasting and the use of pharmacologic agents to reduce the risk of pulmonary aspiration. *Anesthesiology*. 2017; 126(3):376–93. [PubMed](#)
  2. Frykholm P, Disma N, Andersson H, et al. Pre-operative fasting in children: A guideline from the European Society of Anaesthesiology and Intensive Care. *Eur J Anaesthesiol*. 2022; 39:4. [PubMed](#)
  3. Engelhardt T, Wilson G, Horne L, Weiss. Are you hungry? Are you thirsty? Fasting times in elective outpatient pediatric patients. *Paediatr Anaesth*. 2011; 21:964–968. [PubMed](#)
  4. Andersson H, Zaren B, Frykholm P. Low incidence of pulmonary aspiration in children allowed intake of clear fluids until called to the operating suite. *Paediatr Anaesth*. 2015; 25:770–777. [PubMed](#)
  5. Newton RJG, Stuart GM, Willdridge DJ, et al. Using quality improvement methods to reduce clear fluid fasting times in children on a preoperative ward. *Paediatr Anaesth*. 2017; 27:793–800. [PubMed](#)
  6. Thomas M, Morrison C, Newton R, et al. Consensus statement on clear fluids fasting for elective pediatric general anesthesia. *Paediatr Anaesth*. 2018; 28:411–4. [PubMed](#)
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