SOAP
Society for Obstetric Anesthesia and Perinatology

Advancing the pregnancy-related health and outcomes of pregnant women and their newborn.

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Considerations for NPO Guidelines and Gastric Emptying during Labor and Delivery

SOAP Task Force for OB/GYN Continuing Education
Learning Objectives

• Assess the risk (and benefit) of oral intake during labor and delivery.
• Identify the type and timing of oral intake that is permissible in the pregnant population.
• Define appropriate candidates for oral intake during labor.
• Predict patients at greatest risk of complications associated with oral intake.
Introduction

• Pregnant patients face increased risk of pulmonary aspiration due to:
  1. Changes in gastric physiology in the context of labor (and maybe also secondary to pain, stress and/or anxiety)
  2. Mechanical compression by the uterus (and consequent increased intragastric pressure)

However...

• There are known benefits in allowing oral intake during uncomplicated labor.

• Labor is a dynamic process. The potential progression of a once uncomplicated labor to a delivery at elevated risk requires constant vigilance by the OB/GYN and obstetric anesthesiologist regarding the permission or restriction of food and/or liquid consumption.
Background: RISK of Oral Intake

• Traditional fasting during labor guidelines and recommendations originate from Dr. Mendelson’s classic description of respiratory failure secondary to acid pulmonary aspiration during obstetric anesthesia in 1946.

• Pulmonary aspiration occurs most often during induction of general anesthesia and tracheal extubation.

• Neuraxial anesthesia techniques and advanced airway preparation have likely reduced risk of pulmonary aspiration (in obstetrics, the estimated risk is 0.0625 – 0.15%).

• The current rationale for parturient fasting during labor is protection from pulmonary aspiration in the event general anesthesia is required for emergency cesarean delivery.
Background: BENEFIT of Oral Intake

- Evidence from Enhanced Recovery After Surgery (ERAS)\(^1\) protocols to conserve normal physiology in the perioperative period suggests that intravenous fluid loading to compensate for prolonged patient fasting slows recovery. Oral intake restriction can increase the incidence of impaired glucose metabolism and postoperative insulin resistance.

- Eating and drinking during labor can improve a patient’s level of energy, comfort and satisfaction.

- The impact of permissive oral intake upon the duration of labor, the mode of delivery, and other obstetric and neonatal outcomes is not yet known.
Clinical Correlation

Case 1: Any berry-flavored Italian ices on the menu? A healthy patient presenting in labor

A 19 yo G1P0 (BMI 35) presents to labor and delivery triage at 37 weeks gestational age. Her sporadic contractions are now occurring every 4 minutes and “unbearable”. Her cervical exam changed from 4 cm dilated and 50% effaced to 6 cm and 80% effaced in 2 hours. She is admitted for expectant management of labor.

The patient tells her nurse that she recently started a new diet similar to the Keto-diet, strictly forbidding any oral intake for extended periods of time. She has not had anything to eat or drink in over 8 hours and is requesting Italian ice.

What is the appropriate management of her oral intake during labor?
**Definition: Complicated Patient**

= having additional risk factors for aspiration

**Maternal Risk Factors**

- Known or suspected difficulty to ventilate/intubate
- Morbid obesity (BMI > 40 kg/m²)
- Chronic opioid use (delayed gastric emptying)
- Intention to use parenteral opioids for labor analgesia
- Upper gastrointestinal tract disorder/abnormal gastric anatomy and/or function
- Neurologic condition or altered level of consciousness (including Magnesium therapy)
Definition: Complicated Patient
= additional risk for cesarean delivery

Obstetric Risk Factors
• Preterm Labor
• Trial of Labor After Cesarean (TOLAC)
• Placental pathology (previa, abruption)

Fetal Risk Factors
• Non-reassuring fetal status
• Fetal growth restriction
• Multiple gestation

Maternal Risk Factors
• Known medical condition that may increase the likelihood of complicated or operative delivery
Definition: Complicated Patient
= additional risk for general anesthesia

Maternal Risk Factors
• Known coagulopathy/severe thrombocytopenia
• Other contraindication to/refusal of neuraxial anesthesia
• Failed neuraxial anesthesia
### Case 1: Should oral intake be permitted for an uncomplicated patient during labor?

<table>
<thead>
<tr>
<th>Source</th>
<th>Date</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACOG Committee Opinion</td>
<td>2017 (Reaffirmed from 2009)</td>
<td>Modest amounts of clear liquids for patients with uncomplicated labor (i.e., healthy patient at ≥ 37 weeks gestational age, singleton pregnancy in vertex presentation).</td>
</tr>
<tr>
<td>ASA Task Force on Obstetric Anesthesia and SOAP</td>
<td>2016 (Updated from 2007)</td>
<td>Moderate amounts of clear liquids for uncomplicated laboring patients. Solid foods should be avoided.</td>
</tr>
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ACOG = American College of Obstetricians and Gynecologists  
ASA = American Society of Anesthesiologists
Definition: Clear Liquids

Examples include, but are not limited to:

- Water
- Carbonated beverages
- Black coffee and tea with sugar or sweetener
- Fruit juices (without pulp or particulate)
- Jello
- Popsicles, Italian ice (non-particulate, non-dairy)
- Sports drinks with carbohydrates

**NO milk, cream**

**NO gum, candy**
Case 1: Uncomplicated Labor

- This patient may benefit from carbohydrate-supplying clear liquids.
- In labor, there is an average energy consumption of 50-100 kcal/hour – this expenditure is equivalent to that of continuous moderate aerobic exercise! Carbohydrate consumption during aerobic exercise decreases fatigue and enhances performance.
- Laboring women given carbohydrates have demonstrated a shortened second stage of labor (without significant differences in neonatal outcomes, such as APGAR scores)\(^2\).
Case 1a: Labor for a medically-complex patient

The patient develops a headache, elevated blood pressures, and has a protein/creatinine of 0.41. She is started on magnesium for seizure prophylaxis. Should permission of clear liquids during labor be reevaluated?

• The patient exhibits signs and symptoms of preeclampsia.
• This patient now may face increased risk of aspiration and clear liquids may not be appropriate.
• Routine NPO guidelines intended to prevent risk of pulmonary aspiration should be enforced in complicated patients during labor.
Clinical Correlation

Case 2: *Breakfast of Cesarean Champions. A scheduled repeat cesarean delivery*

A healthy 32yo (90kg) G2P1 presents at 38 weeks 6 days gestation for her scheduled repeat elective cesarean delivery. On arrival, the patient reports that she ate breakfast (egg and cheese croissant with hot chocolate) on her way to the hospital about 1 hour ago. Fetal monitoring is reassuring and the patient denies symptoms of labor.

What is the appropriate timing of her delivery after a full meal?
Case 2: Should oral intake be permitted for an elective cesarean delivery?

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<tr>
<td>ACOG Committee Opinion</td>
<td>2017 (Reaffirmed from 2009)</td>
<td>Patients undergoing elective cesarean delivery (or elective postpartum tubal ligation) should fast 6 – 8 hours prior to procedure.</td>
</tr>
<tr>
<td>ASA Task Force on Obstetric Anesthesia and SOAP</td>
<td>2016 (Updated from 2007)</td>
<td>Clear liquids are permitted up to 2 hours before the induction of anesthesia. The patient should undergo a fasting period of solids for 6 – 8 hours, depending on the type of food ingested (e.g., fat content). Before surgery, consider aspiration prophylaxis.</td>
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Definition: Aspiration Prophylaxis

1. **Nonparticulate antacids** (large particles will increase risk of aspiration pneumonitis)
   e.g., Sodium Citrate (Bicitra)
   - Neutralizes gastric content (30mL dose PO will alkalize 300mL gastric content for 30min)
   - Onset: 20 minutes (if not in OR within 20 mins, repeat dose)
   - Duration: 2 – 3 hours

2. **H₂-receptor antagonists**
   e.g., Ranitidine (Zantac)
   - Inhibits gastric acid secretion
   - Dose: 30 – 50mg
   - Onset: IV within 30 minutes (peak activity after 60 – 90 minutes)
   - Duration: 8 - 12 hours

3. **Metoclopramide (Reglan)**
   - Stimulates gastric motility, increases lower esophageal sphincter tone
   - Dose: 10mg
   - Onset: 1 – 3 minutes (peak reduction in gastric content within 15 minutes)
   - Duration 1 - 2 hours
   - Contraindications: risk of extrapyramidal symptoms
Case 2: Elective Cesarean Delivery

• Current data indicate that risk of acid pulmonary aspiration resulting in maternal morbidity or mortality has decreased substantially over 30 years and is relatively low.\(^3\)

• A specific fasting time for solids that is predictive of maternal anesthetic complications has not been determined. There is insufficient published literature to address the safety of *any* fasting period for solids in obstetric patients.
Case 2: Elective Cesarean Delivery

Literature is not available that examines the relation between reduced gastric acidity and the frequency of pulmonary aspiration, emesis, morbidity, or mortality in obstetric patients who have aspirated gastric contents. Randomized controlled trials indicate that:

- Preoperative nonparticulate antacids (e.g., sodium citrate and sodium bicarbonate) are associated with higher gastric pH values during the peripartum period and are equivocal regarding gastric volume.
- H2-receptor antagonists are associated with higher gastric pH values in obstetric patients and are equivocal regarding gastric volume.
- Metoclopramide is associated with reduced peripartum nausea and vomiting.

Practice guidelines for obstetric anesthesia: an updated report by ASA Task Force 2016
Case 2a: Urgent Cesarean Delivery

The patient’s nurse calls to tell you that while the patient was changing into a hospital gown, her membranes ruptured spontaneously. The patient is now complaining of tightening in her abdomen. A routine preoperative ultrasound scan diagnoses breech presentation.

What is the appropriate timing of her cesarean delivery now?
Case 2a: Urgent Cesarean Delivery

- Again, the absolute risk of pulmonary aspiration in the patient population undergoing cesarean delivery is considered low.
- Weighing the relative risk of aspiration against specific obstetric or fetal risks (e.g., umbilical cord prolapse, fetal hypoxia) is appropriate and will require collaborative decision-making between the obstetric and anesthesia teams for each individual patient.
Recent Research and Controversies

- Radiological evaluation (such as gastric ultrasound) of the cross-sectional area of the antrum, body and fundus may be helpful in guidance – but has not proven – to reduce risk of aspiration.\(^4\)
- Insufficient evidence exists on aspiration prophylaxis in laboring patients with risk factors, thus should be managed on a case by case basis.
- Specific fasting times for solids are not determined in research studies, and the relationship between fasting times for clear liquids and risk of aspiration is unclear.
- Gastric emptying may not return to normal function within the first hour after delivery but only from the 18\(^{th}\) hour postpartum (consider for surgery in the peripartum period).\(^5\)
Key Points

- Moderate amounts of clear liquids may be allowed in the uncomplicated parturient during labor.
- Modest oral intake of clear liquids may be permissible for a patient undergoing uncomplicated elective cesarean delivery up to 2 hours prior to induction of anesthesia.
- Solid food intake for elective cesarean delivery should be held 6-8 hours prior to induction of anesthesia, depending on fat content.
- Patients at elevated risk for pulmonary aspiration (e.g., morbid obesity, diabetes, difficult airway) or risk for need of operative delivery should be assessed (and possibly reassessed) on a case by case basis to balance risk versus benefit of continued oral intake.


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