



Complete Summary

GUIDELINE TITLE

Practice guidelines for preoperative fasting and the use of pharmacologic agents to reduce the risk of pulmonary aspiration.

BIBLIOGRAPHIC SOURCE(S)

American Society of Anesthesiologists. 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. *Anesthesiology* 1999 Mar; 90(3): 896-905. [0 references] [PubMed](#)

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SCOPE

DISEASE/CONDITION(S)

Pulmonary Aspiration

GUIDELINE CATEGORY

Evaluation
Prevention

CLINICAL SPECIALTY

Anesthesiology

INTENDED USERS

Physicians

GUIDELINE OBJECTIVE(S)

To enhance the quality and efficiency of anesthesia care, stimulate evaluation of individual practices, and reduce the severity of complications related to pulmonary aspiration of gastric contents, should it occur.

TARGET POPULATION

Healthy patients of all ages undergoing elective anesthetic procedures.

INTERVENTIONS AND PRACTICES CONSIDERED

- Preoperative assessment (e.g., history, physical examination, survey/interview)
- Preoperative fasting periods for solids and liquids (clear liquids, breast milk, infant formula, solids and/or non-human milk)
- Preoperative gastrointestinal stimulants (e.g., metoclopramide) for reducing gastric volume
- Preoperative pharmacologic blockade of gastric acid secretion (e.g., cimetidine, famotidine, or ranitidine)
- Preoperative antacids (sodium citrate, sodium bicarbonate or magnesium trisilicate), antiemetics (droperidol, ondansetron), anticholinergics (atropine, scopolamine, or glycopyrrolate), and multiple agents (histamine-2 receptor antagonists, gastrointestinal stimulants, and antacids) for reducing gastric acidity, nausea and vomiting during the perioperative period, and reducing gastric volume, respectively

MAJOR OUTCOMES CONSIDERED

- Adverse consequences of pulmonary aspiration (e.g., pneumonia, respiratory disabilities and related morbidity)
- Patient comfort
- Patient satisfaction
- Cost/utilization of perioperative preventive medication

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The guideline developer conducted an electronic search that covered a 31-year period from 1966 through 1996. The manual search covered a 57-year period of time from 1940 through 1996

NUMBER OF SOURCE DOCUMENTS

Over 3000 citations were initially identified, yielding a total of 1156 non-overlapping articles that addressed topics related to the 10 evidence linkages. Following review of the articles, 924 studies did not provide direct evidence, and were subsequently eliminated. A total of 232 articles (from 48 journals) contained direct linkage-related evidence.

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

The following terms describe the strength of scientific data when sufficient literature is available.

- Supportive: There is sufficient quantitative information from adequately designed studies to describe a statistically significant relationship ($p < 0.01$) between a clinical intervention and a clinical outcome, using the technique of meta-analysis.
- Suggestive: There is enough information from case reports and descriptive studies to provide a directional assessment of the relationship between a clinical intervention and a clinical outcome. This type of qualitative information does not permit a statistical assessment of significance.
- Equivocal: Qualitative data have not provided a clear direction for clinical outcomes related to a clinical intervention and (1) there is insufficient quantitative information or (2) aggregated comparative studies have found no quantitatively significant differences among groups or conditions.

METHODS USED TO ANALYZE THE EVIDENCE

Meta-Analysis
Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

The scientific assessment of these Guidelines was based on the following statements, or evidence linkages. These linkages represent directional statements about relationships between preoperative fasting and pharmacologic prophylaxis of pulmonary aspiration and clinical outcomes.

1. A preoperative assessment (e.g., history, physical exam, survey/interview):
a) increases patient comfort, b) reduces adverse outcomes, c) improves patient satisfaction, and d) improves cost/utilization of services.
2. For adults, preoperative fasting status of solids between 4 and 8 hours: a) increases patient comfort, b) reduces adverse outcomes, c) improves patient satisfaction, and d) improves cost/utilization of services.
3. For adults, preoperative fasting status of liquids between 2 and 4 hours: a) increases patient comfort, b) reduces adverse outcomes, c) improves patient satisfaction, and d) improves cost/utilization of services.

4. For children, infants and neonates, preoperative fasting status of milk, breast milk or formula between 2 and 4 hours: a) increases patient comfort, b) reduces adverse outcomes, c) improves patient satisfaction, and d) improves cost/utilization of services.
5. Preoperative gastrointestinal stimulants: a) increases patient comfort, b) reduces adverse outcomes, c) improves patient satisfaction, and d) improves cost/utilization of services.
6. Preoperative pharmacologic blockage of gastric acid secretion (i.e., histamine-2 receptor antagonists and proton pump inhibitors): a) increases patient comfort, b) reduces adverse outcomes, c) improves patient satisfaction, and d) improves cost/utilization of services.
7. Preoperative antacids: a) increase patient comfort, b) reduce adverse outcomes, c) improve patient satisfaction, and d) improve cost/utilization of services.
8. Preoperative antiemetics: a) increase patient comfort, b) reduce adverse outcomes, c) improve patient satisfaction, and d) improve cost/utilization of services.
9. Preoperative anticholinergics: a) increase patient comfort, b) reduce adverse outcomes, c) improve patient satisfaction, and d) improve cost/utilization of services.
10. Preoperative multiple agents (e.g., triple prophylaxis): a) increase patient comfort, b) reduce adverse outcomes, c) improve patient satisfaction, and d) improve cost/utilization of services.

A directional result for each study was initially determined by classifying the outcome as either supporting a linkage, refuting a linkage, or neutral. The results were then summarized to obtain a directional assessment of support for each linkage.

Combined probability tests were applied to continuous data, and an odds-ratio procedure was applied to dichotomous study results. Two combined probability tests were employed as follows: (1) The Fisher Combined Test, producing chi-square values based on logarithmic transformations of the reported p-values from the independent studies, and (2) the Stouffer Combined Test, providing weighted representation of the studies by weighting each of the standard normal deviates by the size of the sample. A procedure based on the Mantel-Haenszel method for combining study results using 2 x 2 tables was available for use with outcome frequency information. An acceptable significance level was set at $p < 0.01$ (one-tailed) and effect size estimates were calculated. Interobserver agreement was established through assessment of interrater reliability testing. Tests for heterogeneity of the independent samples were conducted to assure consistency among the study results. To control for potential publishing bias, a "fail-safe N" value was calculated for each combined probability test. No search for unpublished studies was conducted, and no reliability tests for locating research results were done.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The American Society of Anesthesiologists (ASA) appointed a Task Force of 10 members to (a) review the published evidence; (b) obtain consultant opinion from a representative body of anesthesiologists, nurse anesthetists, anesthesiology assistants, perioperative nurses, surgeons, gastroenterologists and other internists, dentists and oral surgeons, ophthalmologists, psychiatrists, emergency medicine physicians, and practice management staff personnel; and (c) build consensus within the Task Force. The Task Force members consisted of anesthesiologists in both private and academic practices from various geographic areas of the United States and Canada and methodologists from the ASA Ad-Hoc Committee on Practice Parameters.

The Task Force met its objective in a five-step process. First, original published research studies relevant to these issues were reviewed and analyzed. Second, consultants from around the world who practice or work in various settings (e.g., academic and private practice) were asked to (a) participate in a survey of their impressions of the effectiveness of various fasting and pharmacologic interventions to decrease the risks of perioperative pulmonary aspiration, and (b) review and comment on the initial draft report of the Task Force. Third, the Task Force held an open forum at a major national anesthesia meeting to solicit input on its draft recommendations from attendees of the meeting. Fourth, all available information was used to build consensus within the Task Force on the recommended guidelines that follow. The fifth and final step is covered in the "Description of Guideline Validation Methods" field.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Consultants from various geographic areas of the United States who practice or work in various settings (e.g., academic and private practice) and who participated in opinion surveys and review and comment on drafts of the Guidelines (see the "Description of Methods to Formulate the Recommendations" field), were surveyed to assess their opinions on the feasibility of implementing the Guidelines as the last step of guideline development.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

I. PREOPERATIVE ASSESSMENT

Recommendations:

A review of pertinent medical records, a physical examination, and patient survey or interview should be performed as part of the preoperative evaluation. The history, examination, and interview should include pertinent assessment of gastroesophageal reflux disease, dysphagia symptoms, or other gastrointestinal motility disorders, potential for difficult airway management, and metabolic disorders (e.g., diabetes mellitus) that may increase the risk of regurgitation and pulmonary aspiration. Patients should be informed of fasting requirements and the reasons for them sufficiently in advance of their procedures. Verification of their compliance with the fasting requirements should be assessed at the time of their procedures. When the following fasting guidelines are not followed, the practitioner should compare the risks and benefits of proceeding, with consideration given to the amount and type of liquids or solids ingested.

II. PREOPERATIVE FASTING STATUS (CLEAR LIQUIDS)

Recommendations:

It is appropriate to fast from intake of clear liquids for 2 or more hours before procedures requiring general anesthesia, regional anesthesia, or sedation/analgesia (monitored anesthesia care). Examples of clear liquids include, but are not limited to, water, fruit juices without pulp, carbonated beverages, clear tea, and black coffee. These liquids should not include alcohol. The volume of liquid ingested is less important than the type of liquid ingested.

III. PREOPERATIVE FASTING STATUS (BREAST MILK)

Recommendations:

It is appropriate to fast from intake of breast milk for 4 or more hours before procedures requiring general anesthesia, regional anesthesia, or sedation/analgesia (i.e., monitored anesthesia care).

IV. PREOPERATIVE FASTING STATUS (INFANT FORMULAE)

Recommendations:

It is appropriate to fast from intake of infant formula for 6 or more hours before elective procedures requiring general anesthesia, regional anesthesia, or sedation/analgesia (e.g., monitored anesthesia care).

V. PREOPERATIVE FASTING STATUS (SOLIDS AND NON-HUMAN MILK)

Recommendations:

It is appropriate to fast from intake of a light meal or non-human milk for 6 or more hours before elective procedures requiring general anesthesia, regional anesthesia, or sedation/analgesia (e.g., monitored anesthesia care). The Task

Force notes that intake of fried or fatty foods or meat may prolong gastric emptying time. Both the amount and type of foods ingested must be considered when determining an appropriate fasting period. Since non-human milk is similar to solids in gastric emptying time, the amount ingested must be considered when determining an appropriate fasting period.

VI. PREOPERATIVE GASTROINTESTINAL STIMULANTS

Recommendations:

The routine preoperative use of gastrointestinal stimulants to decrease the risks of pulmonary aspiration in patients who have no apparent increased risk for pulmonary aspiration is not recommended.

VII. PREOPERATIVE PHARMACOLOGIC BLOCKADE OF GASTRIC ACID SECRETION

Recommendations:

The routine preoperative use of medications that block gastric acid secretion to decrease the risks of pulmonary aspiration in patients who have no apparent increased risk for pulmonary aspiration is not recommended.

VIII. PREOPERATIVE ANTACIDS

Recommendations:

The routine preoperative use of antacids to decrease the risks of pulmonary aspiration in patients who have no apparent increased risk for pulmonary aspiration is not recommended. Only nonparticulate antacids should be used when antacids are indicated for selected patients for purposes other than reducing the risk of pulmonary aspiration.

IX. PREOPERATIVE ANTIEMETICS

Recommendations:

The routine preoperative use of antiemetics to reduce the risks of pulmonary aspiration in patients who have no apparent increased risk for pulmonary aspiration is not recommended.

X. PREOPERATIVE ANTICHOLINERGICS

Recommendations:

The use of anticholinergics to decrease the risks of pulmonary aspiration is not recommended.

XI. PREOPERATIVE MULTIPLE AGENTS

Recommendations:

The routine preoperative use of multiple agents in patients who have no apparent increased risk for pulmonary aspiration is not recommended.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

Scientific evidence was derived from aggregated human research literature, with meta-analyses utilized when appropriate, and from surveys, open presentations and other consensus-oriented activities

The literature relating to eight evidence linkages contained enough studies with well-defined experimental designs and statistical information to conduct formal meta-analyses. These eight linkages were: linkage 3a [preoperative fasting status of liquids between 2 and 4 hours for adults], 3b [preoperative fasting status of liquids between 2 and 4 hours for children], 5 [preoperative gastrointestinal stimulants], 6 [preoperative histamine-2 receptor antagonists], 7 [preoperative antacids], 8 [preoperative antiemetics], 9 [preoperative anticholinergics], and 10 [preoperative multiple agents versus single agents].

The findings of the literature analyses were supplemented by the opinions of Task Force members as well as by surveys of the opinions of a panel of Consultants.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Enhanced quality and efficiency of anesthesia care including the following benefits:

- Decreased frequency and severity of complications related to pulmonary aspiration of gastric contents
- Cost-effective utilization of perioperative preventive medication
- Decreased risk of dehydration or hypoglycemia from prolonged fasting
- Increased patient satisfaction
- Avoidance of delays and cancellations
- Decreased risk of perioperative morbidity.

POTENTIAL HARMS

Fasting is associated with risk of dehydration and hypoglycemia.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

Practice guidelines are systematically developed recommendations that assist the practitioner and patient in making decisions about health care. These recommendations may be adopted, modified, or rejected according to clinical needs and constraints.

Practice guidelines are not intended as standards or absolute requirements. The use of practice guidelines cannot guarantee any specific outcome. Practice guidelines are subject to periodic revision as warranted by the evolution of medical knowledge, technology, and practice. The guidelines provide basic recommendations that are supported by analysis of the current literature and by a synthesis of expert opinion, open forum commentary, and clinical feasibility data.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Staying Healthy

IOM DOMAIN

Effectiveness
Safety

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

American Society of Anesthesiologists. 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. *Anesthesiology* 1999 Mar; 90(3):896-905. [0 references] [PubMed](#)

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

1999

GUIDELINE DEVELOPER(S)

American Society of Anesthesiologists - Medical Specialty Society

SOURCE(S) OF FUNDING

American Society of Anesthesiologists

GUIDELINE COMMITTEE

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

ENDORSER(S)

Not applicable

GUIDELINE STATUS

This is the current release of the guideline.

An update is not in progress at this time.

GUIDELINE AVAILABILITY

Electronic copies: Available from the [American Society of Anesthesiologists Web site](#).

Print copies: Available from the American Society of Anesthesiologists, 520 N. Northwest Highway, Park Ridge, IL 60068-2573.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Arens JF. A practice parameters overview. *Anesthesiology* 1993 Feb; 78(2):229-30.

NGC STATUS

This summary was completed by ECRI on May 31, 1999. The information was verified by the guideline developer on July 14, 1999.

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Date Modified: 11/15/2004

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