General

Guideline Title


Bibliographic Source(s)


Guideline Status

This is the current release of the guideline.


Recommendations

Major Recommendations

I. Preanesthesia History and Physical Examination
   - Impact
     - The assessment of anesthetic risks associated with the patient's medical conditions, therapies, alternative treatments, surgical and other procedures, and of options for anesthetic techniques is an essential component of basic anesthetic practice.
     - Benefits may include, but are not limited to, the safety of perioperative care, optimal resource use, improved outcomes, and patient satisfaction.
   - Timing
     - An assessment of readily accessible, pertinent medical records with consultations, when appropriate, should be performed as part of the preanesthetic evaluation before the day of surgery for procedures with high surgical invasiveness.
     - For procedures with low surgical invasiveness, the review and assessment of medical records may be done on or before the day of surgery by anesthesia staff.
     - The information obtained may include, but should not be limited to, (1) a description of current diagnoses; (2) treatments, including medications and alternative therapies used; and (3) determination of the patient's medical condition(s).
     - The timing of such assessments may not be practical with the current limitation of resources provided in specific healthcare systems or practice environments.
An initial record review, patient interview, and physical examination should be performed before the day of surgery for patients with high severity of disease. For patients with low severity of disease and undergoing procedures with high surgical invasiveness, the interview and physical exam should also be performed before the day of surgery. For patients with low severity of disease undergoing procedures with medium or low surgical invasiveness, the initial interview and physical exam may be performed on or before the day of surgery. At a minimum, a focused preanesthetic physical examination should include an assessment of the airway, lungs, and heart, with documentation of vital signs. It is the obligation of the healthcare system to, at a minimum, provide pertinent information to the anesthesiologist for the appropriate assessment of the severity of medical condition of the patient and invasiveness of the proposed surgical procedure well in advance of the anticipated day of procedure for all elective patients.

II. Selection and Timing of Preoperative Tests

- Routine Preoperative Testing
  - Preoperative tests should not be ordered routinely.
  - Preoperative tests may be ordered, required, or performed on a selective basis for purposes of guiding or optimizing perioperative management.
    - The indications for such testing should be documented and based on information obtained from medical records, patient interview, physical examination, and type and invasiveness of the planned procedure.
  - Preoperative Testing in the Presence of Specific Clinical Characteristics
    - There is insufficient evidence to identify explicit decision parameters or rules for ordering preoperative tests on the basis of specific clinical characteristics.
    - Consideration of selected clinical characteristics may assist the anesthesiologist when deciding to order, require, or perform preoperative tests. The following clinical characteristics may be of merit, although the anesthesiologist should not limit consideration to the characteristics suggested below.
      - Electrocardiogram (ECG)
        - Important clinical characteristics may include cardiocirculatory disease, respiratory disease, and type or invasiveness of surgery.
        - The Task Force recognizes that ECG abnormalities may be higher in older patients and in patients with multiple cardiac risk factors.
        - An ECG may be indicated for patients with known cardiovascular risk factors or for patients with risk factors identified in the course of a preanesthesia evaluation. Age alone may not be an indication for ECG.
      - Preanesthesia Cardiac Evaluation Other Than ECG
        - Preanesthesia cardiac evaluation may include consultation with specialists and ordering, requiring, or performing tests that range from noninvasive passive or provocative screening tests (e.g., stress testing) to noninvasive and invasive assessment of cardiac structure, function, and vascularity (e.g., echocardiogram, radionucleotide imaging, cardiac catheterization).
        - Anesthesiologists should balance the risks and costs of these evaluations against their benefits.
        - Clinical characteristics to consider include cardiovascular risk factors and type of surgery.
      - Preanesthesia Chest Radiographs
        - Clinical characteristics to consider include smoking, recent upper respiratory infection, chronic obstructive pulmonary disease (COPD), and cardiac disease.
        - The Task Force recognizes that chest radiographic abnormalities may be higher in such patients but does not believe that extremes of age, smoking, stable COPD, stable cardiac disease, or resolved recent upper respiratory infection should be considered unequivocal indications for chest radiography.
      - Preanesthesia Pulmonary Evaluation Other than Chest X-ray
        - Preanesthesia pulmonary evaluation other than chest x-ray may include consultation with specialists and tests that range from noninvasive passive or provocative screening tests (e.g., pulmonary function tests, spirometry, pulse oximetry) to invasive assessment of pulmonary function (e.g., arterial blood gas).
        - Anesthesiologists should balance the risks and costs of these evaluations against their benefits.
        - Clinical characteristics to consider include type and invasiveness of the surgical procedure, interval from previous evaluation, treated or symptomatic asthma, symptomatic COPD, and scoliosis with restrictive function.
      - Preanesthesia Hemoglobin or Hematocrit
        - Routine hemoglobin or hematocrit is not indicated.
Clinical characteristics to consider as indications for hemoglobin or hematocrit include type and invasiveness of procedure, patients with liver disease, extremes of age, and history of anemia, bleeding, and other hematologic disorders.

**Preanesthesia Coagulation Studies**
- Clinical characteristics to consider for ordering selected coagulation studies include bleeding disorders, renal dysfunction, liver dysfunction, and type and invasiveness of procedure.
  - The Task Force recognizes that anticoagulant medications and alternative therapies may present an additional perioperative risk.
  - The Task Force believes that there were not enough data to comment on the advisability of coagulation tests before regional anesthesia.

**Preanesthesia Serum Chemistries (i.e., Potassium, Glucose, Sodium, Renal and Liver Function Studies)**
- Clinical characteristics to consider before ordering preanesthesia serum chemistries include likely perioperative therapies, endocrine disorders, risk of renal and liver dysfunction, and use of certain medications or alternative therapies.
  - The Task Force recognizes that laboratory values may differ from normal values at extremes of age.

**Preanesthesia Urinalysis**
- Urinalysis is not indicated except for specific procedures (e.g., prosthesis implantation, urologic procedures) or when urinary tract symptoms are present.

**Preanesthesia Pregnancy Testing**
- Patients may present for anesthesia with early undetected pregnancy.
  - The Task Force believes that the literature is inadequate to inform patients or physicians on whether anesthesia causes harmful effects on early pregnancy.
  - Pregnancy testing may be offered to female patients of childbearing age and for whom the result would alter the patient's management.

**Timing of Preoperative Testing**
- The current literature is not sufficiently rigorous to permit an unambiguous assessment of the clinical benefits or harms of the timing for preoperative tests.
  - There is insufficient evidence to identify explicit decision parameters or "rules" for ordering preoperative tests on the basis of specific patient factors.
  - Test results obtained from the medical record within 6 months of surgery generally are acceptable if the patient's medical history has not changed substantially.
  - More recent test results may be desirable when the medical history has changed, or when a test result may play a role in the selection of a specific anesthetic technique (e.g., regional anesthesia in the setting of anticoagulation therapy).

**III. Summary and Conclusions**
- Content of the preanesthetic evaluation includes, but is not limited to, (1) readily accessible medical records, (2) patient interview, (3) a directed preanesthesia examination, (4) preoperative tests when indicated, and (5) other consultations when appropriate. At a minimum, a directed preanaesthetic physical examination should include an assessment of the airway, lungs, and heart.
- Timing of the preanesthetic evaluation can be guided by considering combinations of surgical invasiveness and severity of disease, as shown in table 2 in appendix 2 in the original guideline document.
  - Limitations in resources available to a specific healthcare system or practice environment may affect the timing of the preanesthetic evaluation.
  - The healthcare system is obligated to provide pertinent information to the anesthesiologist for the appropriate assessment of the invasiveness of the proposed surgical procedure and the severity of the patient's medical condition well in advance of the anticipated day of procedure for all elective patients.
  - Routine preoperative tests (i.e., tests intended to discover a disease or disorder in an asymptomatic patient) do not make an important contribution to the process of perioperative assessment and management of the patient by the anesthesiologist.
  - Selective preoperative tests (i.e., tests ordered after consideration of specific information obtained from sources such as medical records, patient interview, physical examination, and the type or invasiveness of the planned procedure and anesthesia) may assist the anesthesiologist in making decisions about the process of perioperative assessment and management.
  - Decision-making parameters for specific preoperative tests or for the timing of preoperative tests cannot be unequivocally determined from the available scientific literature.
  - Specific tests and their timing should be individualized and based upon information obtained from sources such as the patient's medical record, patient interview, physical examination, and the type and invasiveness of the planned procedure.
Clinical Algorithm(s)
None provided

Scope

Disease/Condition(s)
Any condition that requires anesthesia for a surgical or non-surgical procedure

Guideline Category
Evaluation
Management

Clinical Specialty
Anesthesiology

Intended Users
Advanced Practice Nurses
Allied Health Personnel
Health Care Providers
Nurses
Physician Assistants
Physicians

Guideline Objective(s)
- To assess the currently available evidence pertaining to the healthcare benefits of preanesthesia evaluation
- To offer a reference framework for the conduct of preanesthesia evaluation by anesthesiologists
- To stimulate research strategies that can assess the healthcare benefits of a preanesthesia evaluation
- To collect new evidence to determine whether recommendations in the existing Practice Advisory were supported by current evidence

Target Population
Patients of all ages who are scheduled to receive general anesthesia, regional anesthesia, or moderate or deep sedation for elective surgical and nonsurgical procedures

Note: The Advisory does not address the selection of anesthetic technique; nor does it address the preanesthesia evaluation of patients requiring urgent or emergency surgery or anesthetic management provided on an urgent basis in other locations (e.g., emergency rooms).

Interventions and Practices Considered
1. Review of medical records
2. Patient interview
3. Timing of preanesthetic assessment based on invasiveness of procedure and severity of disease
4. Physical examination (minimum of airway, lungs, and heart)
5. Selective preoperative tests, if indicated
   - Electrocardiogram (ECG)
   - Cardiac evaluation other than ECG (e.g., stress testing, echocardiogram, radionucleotide imaging, cardiac catheterization)
   - Chest radiographs
   - Pulmonary evaluation other than chest X-ray (e.g., pulmonary function tests, spirometry, pulse oximetry, arterial blood gas)
   - Hemoglobin or hematocrit
   - Coagulation studies
   - Serum chemistries (i.e., potassium, glucose, sodium, renal and liver function studies)
   - Urinalysis for prosthesis implantation, urologic procedures
   - Pregnancy testing if the result would alter patient management
6. Decision making parameters (for specific preoperative tests and timing of tests)

Major Outcomes Considered

- Rate of abnormal findings on preanesthetic evaluations in symptomatic and asymptomatic patients
- Rate of postponement, cancellation, or changes in management of surgery based on preanesthetic evaluations
- Perioperative outcomes, including morbidity and mortality

Methodology

Methods Used to Collect/Select the 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

State of the Literature

For this updated Advisory, a review of studies used in the development of the original Advisory was combined with a review of studies published subsequent to approval of the original Advisory. The updated literature review was based on evidence linkages, consisting of directional statements about relationships between specific preanesthesia evaluation activities and clinical outcomes. The evidence linkage interventions are listed below.

Preanesthesia History and Physical Examination

- Preprocedure review of pertinent medical records
- Patient interviewing for medical or anesthetic history
- Preanesthesia patient examination

Cardiac Evaluation

- Electrocardiogram
- Other cardiac evaluation (e.g., angiography, echocardiography, stress tests)
- Cardiac function tests
- Echocardiography (transesophageal, transthoracic)
- Stress tests
- Ventriculography
Pulmonary Evaluation

- Chest radiography
- Other pulmonary evaluation (e.g., pulmonary function tests, spirometry)

Blood Tests

- Hemoglobin
- Hematocrit
- Complete blood count
- Coagulation studies
- Serum chemistries (i.e., sodium, potassium, glucose)
- Potassium
- Glucose
- Urinalysis (as distinct from pregnancy testing)
- Pregnancy evaluation

For purposes of literature review, potentially relevant clinical studies were identified via electronic and manual searches of the literature. The principal source of citations was PubMed, although citations from the Cochrane database, direct internet searches, task force members, liaisons from other organizations, and hand searches of references located in reviewed articles were also searched. The updated electronic search covered a 10-year period from 2002 through 2011. The manual search covered a 15-year period of time from 1997 through 2011. More than 300 new citations that addressed topics related to the evidence linkages were identified. These articles were reviewed, and studies that did not provide direct evidence were eliminated (combined total = 985). Articles that were accepted as containing direct linkage-related evidence were combined with pre-2002 articles accepted by the 2003 amended Advisory, resulting in a combined total of 245 articles.

No evidence linkage contained sufficient literature with well-defined experimental designs and statistical information to conduct an analysis of aggregated studies (i.e., meta-analysis). A complete bibliography used to develop this updated Advisory, organized by section, is available as Supplemental Digital Content 2, [http://links.lww.com/ALN/A789](http://links.lww.com/ALN/A789).

Number of Source Documents

Articles that were accepted as containing direct linkage-related evidence were combined with pre-2002 articles accepted by the 2003 amended Advisory, resulting in a combined total of 245 articles.

Methods Used to Assess the Quality and Strength of the Evidence

Expert Consensus

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Preparation of this update used the same methodological process as was used in the original Advisory to obtain new scientific evidence. Opinion-based evidence obtained from the original Advisory is reported in this update. The protocol for reporting each source of evidence is described.

Scientific Evidence

Study findings from published scientific literature were aggregated and are reported in summary form by evidence category, as described below. All literature (e.g., randomized controlled trials, observational studies, case reports) relevant to each topic was considered when evaluating the findings. However, for reporting purposes in this document, only the highest level of evidence (i.e., level 1, 2, or 3 identified below) within each category (i.e., A, B, or C) is included in the summary.

Category A: Supportive Literature

Randomized controlled trials report statistically significant ($P<0.01$) differences between clinical interventions for a specified clinical outcome.
Level 1: The literature contains multiple randomized controlled trials, and the aggregated findings are supported by meta-analysis.*

Level 2: The literature contains multiple randomized controlled trials, but there is an insufficient number of studies to conduct a viable meta-analysis.

Level 3: The literature contains a single randomized controlled trial.

Category B: Suggestive Literature

Information from observational studies permits inference of beneficial or harmful relationships among clinical interventions and clinical outcomes.

Level 1: The literature contains observational comparisons (e.g., cohort, case-control research designs) of clinical interventions or conditions and indicates statistically significant differences between clinical interventions for a specified clinical outcome.

Level 2: The literature contains noncomparative observational studies with associative (e.g., relative risk, correlation) or descriptive statistics.

Level 3: The literature contains case reports.

Category C: Equivocal Literature

The literature cannot determine whether there are beneficial or harmful relationships among clinical interventions and clinical outcomes.

Level 1: Meta-analysis did not find significant differences among groups or conditions.

Level 2: The number of studies is insufficient to conduct meta-analysis, and (1) randomized controlled trials have not found significant differences among groups or conditions or (2) randomized controlled trials report inconsistent findings.

Level 3: Observational studies report inconsistent findings or do not permit inference of beneficial or harmful relationships.

Category D: Insufficient Evidence from Literature

The lack of scientific evidence in the literature is described by the following terms.

Inadequate. The available literature cannot be used to assess relationships among clinical interventions and clinical outcomes. The literature either does not meet the criteria for content as defined in the "Focus" of the Advisory or does not permit a clear interpretation of findings due to methodological concerns (e.g., confounding in study design or implementation).

Silent. No identified studies address the specified relationships among interventions and outcomes.

Opinion-based Evidence

The original Advisory contained formal survey information collected from expert consultants and random samples of active members of the American Society of Anesthesiologists. Additional information was obtained from open forum presentations and other invited and public sources. All opinion-based evidence relevant to each topic (e.g., survey data, open-forum testimony, Internet-based comments, letters, and editorials) was considered in the development of the original Advisory. However, only the findings obtained from formal surveys are reported.

Survey responses from Task Force-appointed expert consultants and specialty society members obtained during development of the original Advisory are summarized in the text and reported in appendix 2, tables 1–5 in the original guideline document.

*Practice Advisories lack the support of a sufficient number of adequately controlled studies required to conduct an appropriate meta-analysis. Therefore, categories A1 and C1 evidence are not reported in this document.

Methods Used to Analyze the Evidence

Systematic Review

Description of the Methods Used to Analyze the Evidence

State of the Literature

A study or report that appears in the published literature can be included as evidence in the development of an advisory if it meets four essential criteria. Failure to meet one or more of these criteria means that a study had features that did not make it suitable for analytic purposes. The four
The Task Force developed the original Advisory by means of a six-step process. First, they reached consensus on the criteria for evidence of effectiveness of preanesthesia evaluation. Second, original published articles from peer-reviewed journals relevant to preanesthesia evaluation were evaluated. Third, consultants who had expertise or interest in preanesthesia evaluation and who practiced or worked in various settings (e.g., academic and private practice) were asked to (1) participate in opinion surveys on the effectiveness of various preanesthesia evaluation strategies, and (2) review and comment on a draft of the Advisory developed by the Task Force. Fourth, additional opinions were solicited from active anesthesiologists from various geographic areas of the United States and two methodologists from the ASA Committee on Standards and Practice Parameters.

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members of the ASA. Fifth, the Task Force held several open forums at three major national anesthesia meetings to solicit input on the draft Advisory. Sixth, all available information was used to build consensus within the Task Force to finalize the Advisory.

In 2009, the ASA Committee on Standards and Practice Parameters requested that scientific evidence for this Advisory be updated. The update consists of an evaluation of literature published after completion of the original Advisory.


Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

The guideline developers reviewed published cost analyses.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

For the original Advisory, consultants who had expertise or interest in preanesthesia evaluation and who practiced or worked in various settings (e.g., academic and private practice) were asked to (1) participate in opinion surveys on the effectiveness of various preanesthesia evaluation strategies, and (2) review and comment on a draft of the Advisory developed by the Task Force. Additional opinions were solicited from active members of the American Society of Anesthesiology (ASA). The Task Force held several open forums at three major national anesthesia meetings to solicit input on the draft Advisory. All available information was used to build consensus within the Task Force to finalize the Advisory.

The draft of the updated document was made available for review on the ASA Web site.

This Practice Advisory was approved by the ASA House of Delegates on October 19, 2011.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The Task Force relied primarily upon observational literature, opinion surveys of consultants, and surveys of a random sample of members of the American Society of Anesthesiologists.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

- Potential benefits of anesthesia interventions, tests, and consultations may include a change in the content or timing of anesthetic management or perioperative resource use that may improve the safety and effectiveness of anesthetic processes involved with perioperative care.
- Benefits of preoperative history and physical examination may include, but are not limited to, the safety of perioperative care, optimal resource utilization, improved outcomes, and patient satisfaction.
Potential Harms

Potential adverse effects of anesthesia interventions, tests, and consultations may include interventions that result in injury, discomfort, inconvenience, delays, or costs that are not commensurate with the anticipated benefits.

Qualifying Statements

Qualifying Statements

- Practice Advisories are systematically developed reports that are intended to assist decision-making in areas of patient care. Advisories provide a synthesis and analysis of expert opinion, clinical feasibility data, open forum commentary, and consensus surveys. Practice Advisories developed by the American Society of Anesthesiologists (ASA) are not intended as standards, guidelines, or absolute requirements, and their use cannot guarantee any specific outcome. They may be adopted, modified, or rejected according to clinical needs and constraints and are not intended to replace local institutional policies.
- Practice Advisories are not supported by scientific literature to the same degree as standards or guidelines because of the lack of sufficient numbers of adequately controlled studies.
- Numerous methodological concerns were encountered in the preanesthesia evaluation literature, including (1) lack of "no-test" controls, (2) failure to blind the practitioner to test results before and during the procedure, and (3) confounding of outcomes. These concerns limit the interpretability of published findings and are discussed in more detail in appendix 2 in the original guideline document.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Resources

For information about availability, see the Availability of Companion Documents and Patient Resources fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Staying Healthy

IOM Domain

Effectiveness

Safety
Identifying Information and Availability

Bibliographic Source(s)


Adaptation

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

Date Released

2002 Feb (revised 2012 Mar)

Guideline Developer(s)

American Society of Anesthesiologists - Medical Specialty Society

Source(s) of Funding

American Society of Anesthesiologists

Guideline Committee

Committee on Standards and Practice Parameters

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Financial Disclosures/Conflicts of Interest

Not stated

Guideline Status

This is the current release of the guideline.


Guideline Availability

Electronic copies: Available in Portable Document Format (PDF) and EPUB for eBook devices from the Anesthesiology Journal Web site
Availability of Companion Documents

None available

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI on July 14, 2005. The information was verified by the guideline developer on July 20, 2005. This NGC summary was updated by ECRI Institute on April 20, 2012.

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