PRACTICE ADVISORY FOR PREANESTHESIA EVALUATION
(Approved by the House of Delegates on October 17, 2001, and)
last amended on October 15, 2003)
A Report by the American Society of Anesthesiologists
Task Force on Preanesthesia Evaluation

Developed by the Task Force on Preanesthesia Evaluation: L. Reuven Pasternak, M.D., (Chair),
Baltimore, Maryland; James F. Arens, M.D., Houston, Texas; Robert A. Caplan, M.D., Seattle,
Washington; Richard T. Connis, Ph.D., Woodinville, Washington; Lee A. Fleisher, M.D.,
Baltimore, Maryland; Richard Flowerdew, M.B., Portland, Maine; Barbara S. Gold, M.D.,
Minneapolis, Minnesota; James F. Mayhew, M.D., League City, Texas; David G. Nickinovich,
Ph.D., Bellevue, Washington; Linda Jo Rice, M.D., St. Petersburg, Florida; Michael F. Roizen,
M.D.; Chicago, Illinois; Rebecca S. Twersky, M.D., Brooklyn, New York.

Supported by the American Society of Anesthesiologists, under the direction of James F. Arens,
M.D., Chair of the Committee on Practice Parameters. A list of articles used to develop this
advisory is available by writing to the American Society of Anesthesiologists.
Readers with special interest in the literature synthesis and consensus statistics used in
establishing this Advisory can receive further information by writing to the American Society

Address reprint requests to American Society of Anesthesiologists, 520 North Northwest
Highway, Park Ridge, IL  60068-2573.

Key words: Anesthesia; Preanesthesia Evaluation; Preoperative Tests.
Introduction

Practice advisories are systematically developed reports that are intended to assist decision-making in areas of patient care where scientific evidence is insufficient to develop an evidence-based model. Practice advisories provide a synthesis of opinion from experts, open forums, and other public sources. Practice advisories report the current state of scientific literature, but are not supported by literature to the same degree as standards or guidelines due to the lack of sufficient numbers of adequately controlled studies.

Advisories are not intended as guidelines, standards, or absolute requirements. The use of practice advisories cannot guarantee any specific outcome. They may be adopted, modified, or rejected according to clinical needs and constraints. Practice advisories are subject to periodic revision as warranted by the evolution of medical knowledge, technology, and practice.

A. Definition of Preanesthesia Evaluation

The literature does not provide a standard definition for preanesthesia evaluation. For this Practice Advisory, the preanesthetic evaluation is defined as the process of clinical assessment that precedes the delivery of anesthesia care for surgery and for non-surgical procedures. For this Advisory, "perioperative" refers to the care surrounding operations and procedures. The preanesthetic evaluation is the responsibility of the anesthesiologist.

Preanesthesia evaluation consists of the consideration of information from multiple sources that may include the patient's medical records, interview, physical examination, and findings from medical tests and evaluations. As part of the preanesthetic evaluation process, the anesthesiologist may choose to consult with other health care professionals to obtain information or services that are relevant to perioperative anesthetic care. Preoperative tests, as a component of the preanesthesia evaluation, may be indicated for various purposes, including but not limited to: 1) discovery or identification of a disease or disorder which may affect perioperative anesthetic care, 2) verification or assessment of an already known disease, disorder, medical or alternative therapy which may affect perioperative anesthetic care, and 3) formulation of specific plans and alternatives for perioperative anesthetic care.
The assessments made in the process of preanesthetic evaluation may be used to educate the patient, organize resources for perioperative care, and formulate plans for intraoperative care, postoperative recovery, and perioperative pain management.

B. Purposes of the Advisory for Preanesthesia Evaluation.

The purposes of this Advisory are to 1) assess the currently available evidence pertaining to the healthcare benefits of preanesthesia evaluation 2) offer a reference framework for the conduct of preanesthesia evaluation by anesthesiologists, and 3) stimulate research strategies that can assess the healthcare benefits of preanesthetic evaluation.

C. Focus.

A preanesthesia evaluation is considered a basic element of anesthesia care. Therefore the focus of this advisory is the assessment of evidence pertaining to the content and timing of a preanesthesia evaluation. The interactions between the preanesthetic evaluation, preoperative evaluation, and perioperative care are beyond the scope and mandate of the Task Force. Informed consent, often undertaken at the same time as the preanesthesia evaluation, is also beyond the scope of this advisory.

D. Application

This Advisory is intended for use by anesthesiologists and those who provide care under the direction of an anesthesiologist. The Advisory applies to patients of all ages who are scheduled to receive general anesthesia, regional anesthesia, moderate or deep sedation for elective surgical and non-surgical procedures. The Advisory does not address the selection of anesthetic technique nor the preanesthetic evaluation of patients requiring urgent or emergency surgery or anesthetic management provided on an urgent basis in other locations, (such as emergency rooms).

E. Criteria for Anesthesia Intervention, Testing, and Consultation
Any evaluations, tests, and consultations required for a patient are done with the reasonable expectation that such activities will result in benefits that exceed the potential adverse effects. Potential benefits may include a change in the content or timing of anesthetic management or perioperative resource utilization that may improve the safety and effectiveness of anesthetic processes involved with perioperative care. Potential adverse effects may include interventions that result in injury, discomfort, inconvenience, delays or costs that are not commensurate with the anticipated benefits.

F. Task Force Members and Consultants

The ASA appointed a Task Force of 12 members to: 1) review published evidence; 2) obtain expert and public consensus opinion; and 3) create a consensus-based assessment of currently available scientific literature and opinion. The Task Force members consisted of anesthesiologists in both private and academic practices from various geographic areas of the United States, and methodologists from the ASA Committee on Practice Parameters.

The Task Force used a six-step process. First, the Task Force reached consensus on the criteria for evidence of effectiveness of preanesthetic evaluation. Second, original published research studies relevant to these issues were reviewed. Third, consultants who had expertise or interest in preanesthetic 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 preanesthetic evaluation strategies, and (2) review and comment on draft reports of the Task Force. Fourth, opinions about various elements of this practice advisory were solicited from a random sample of active members of the American Society of Anesthesiologists. Fifth, the Task Force held several open forums at major national anesthesia meetings to solicit input on the key concepts of this advisory. Sixth, all available information was used to build consensus within the Task Force on the advisory.

G. Availability and Strength of Evidence
Practice advisories are developed by a systematic, consensus-based process. In contrast to evidence-based guidelines, practice advisories lack the support of a sufficient number of adequately controlled scientific studies to permit aggregate analyses of data with rigorous statistical techniques such as meta-analysis. Nonetheless, literature-based evidence for practice advisories is available from limited controlled trials, case reports, descriptive studies, and by the assessment of the strengths and weaknesses of published studies. This literature often permits the identification of recurring patterns of clinical practice. Opinion surveys often reveal similar patterns. The Advisory Statements contained in a practice advisory represent a consensus-based distillation of the clearest patterns of agreement or disagreement.
ADVISORY STATEMENTS

I. Preanesthetic History and Physical Examination.
   A. Impact.

A preanesthesia history and physical examination precedes the ordering, requiring, or performance of specific preanesthesia tests, and consists of: 1) evaluation of pertinent medical records, 2) patient interview(s), and 3) physical examination. No controlled trials of the clinical impact of performing a preanesthetic medical records review or physical examination were found. Several studies reported specific perioperative outcomes (e.g., cardiac, respiratory, renal, hemorrhagic) occurring in patients with specific preexisting conditions (e.g., hypertension, previous myocardial infarction, smoking, pulmonary disease, and age).1-63 Such conditions often are noted in a patient's medical record. Additional studies were examined that reported preexisting conditions (e.g., airway abnormalities, cardiopulmonary disorders) detected during a preanesthetic examination or interview.6, 28, 44, 47, 49, 59, 64-91 Five of these studies resulted in changes in resource management.49, 64, 74, 82, 84 These studies were not controlled trials and were not considered sufficiently rigorous to provide unequivocal evidence of the value of performing a preanesthetic medical records review or physical examination.

Advisory

The Task Force believes that 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 utilization, improved outcomes and patient satisfaction.

B. Timing.

The activities encompassed by a preanesthetic history and physical examination occur over a variable period of time. The timing of an initial preanesthetic evaluation is guided by such factors as patient demographics, clinical conditions, type and invasiveness of procedure, and the nature of the health care system. Three options that practices utilize for the timing of an initial preanesthetic evaluation are: 1) always prior to the day of surgery, 2) either on or before the day of surgery, and 3) only on the day of surgery.
Although no controlled trials addressing the timing of a preanesthetic evaluation were found, survey opinions from expert consultants and a random sample of ASA members were obtained in order to examine potential clinical influences (i.e., patient severity of disease and surgical invasiveness) on timing decisions. Consultant and ASA member opinions regarding the timing of an initial assessment of pertinent medical records for high, medium, and low levels of surgical invasiveness, independent of medical condition, are reported in Table 1. The majority of consultants and ASA members agree that for high surgical invasiveness, the initial assessment of pertinent medical records should be done prior to the day of surgery by anesthesia staff. For medium surgical invasiveness the majority of consultants indicate that the initial assessment of pertinent medical records should be done prior to the day of surgery by anesthesia staff, although the majority of ASA members indicate that the initial assessment may be done on or before the day of surgery. For low surgical invasiveness, the majority of consultants and ASA members agree that the initial assessment may be done on or before the day of surgery.

Consultant and ASA membership opinions regarding the timing of an initial preanesthetic interview and physical examination for high and low severities of disease are reported in Table 2. The majority of consultants and ASA members agree that, for patients with high severity of disease, it is preferable that the interview and physical examination should be done prior to the day of surgery by anesthesia staff. For low severity of disease and high surgical invasiveness consultants and ASA members agree that it is preferable that the interview and physical examination should be done prior to the day of surgery. For patients with low severity of disease and medium or low surgical invasiveness consultants and ASA members agree that the interview and physical examination may be done on or before the day of surgery.

A majority of Consultants and the ASA membership, respectively, agree that, at a minimum, a preanesthetic physical examination should include: 1) an airway exam (100%, 100%), 2) a pulmonary examination to include auscultation of the lungs (88%, 85%), and 3) a cardiovascular examination (81%, 82%).

Advisory

The Task Force consensus is that an assessment of readily accessible, pertinent medical records with consultations when appropriate, should be performed as part of the preanesthetic
evaluation prior to 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). Public commentary at open forums and from the Internet corroborates the Task Force consensus. The Task Force cautions that timing of such assessments may not be practical with the current limitation of resources provided in their specific health care system or practice environment.

The Task Force consensus is that an initial record review, patient interview, and physical examination should be performed prior to 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 prior to 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. Public commentary at open forum and from the internet corroborate the Task Force opinions.

The Task Force cautions that timing of such assessments may not be practical with the current limitation of resources provided in their specific health care system or practice environment. The Task Force believes it is the obligation of the health care 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.

Literature regarding controlled trials and test findings regarding the incidence or frequency of commonly used preoperative tests are described below. For purposes of this Advisory, a
**routine** test is defined as a test ordered in the absence of a specific clinical indication or purpose. Global designations such as “pre-op status” or “surgical screening” are not considered as specific clinical indications or purposes. An **indicated** test is defined as a test that is ordered for a specific clinical indication or purpose. For example, assessment of warfarin therapy effects would be considered an indication for specific coagulation studies.

**Electrocardiogram (ECG):** Routine ECG findings were reported as abnormal in 7.0-42.7% of cases (N=12 studies)\(^{92-103}\) and led to changes in clinical management in 9.1% of the cases found to be abnormal (N=1 study).\(^{100}\) Preoperative ECGs which were ordered as indicated tests resulted in reports of abnormal findings in 4.8-78.8% of cases (N=17 studies)\(^{49,51,82,100,104-116}\) and led to changes in clinical management in 2.0-20.0% of the cases found to be abnormal (N=6 studies).\(^{49,82,100,104,111,112}\) One observational study with investigator and practitioner blinding found that preoperative ECG ischemic episodes were associated with intra-and-postoperative myocardial infarction for older patients with severe coronary artery disease scheduled for elective CABG.\(^{110}\) One observational study reported a 10% or greater incidence of coronary events during the subsequent 10 years for men over 60 without specific clinical indicators and for women over 65 without specific clinical indicators. The incidence increased to 25% in the decade following such patients 75th birthday.\(^{107}\)

**Other cardiac evaluation:** No studies were found that examined outcomes from routine preoperative cardiac evaluations of angiography, echocardiography, or stress tests. For patients with indicated cardiac evaluations, abnormal findings were found with angiography: 22.5-47.0% of cases (N=4 studies),\(^{117-120}\) echocardiography: 7.5%-50.0% of cases (N=5 studies),\(^{121-125}\) stress or exercise tests: 15.0-71.0% of cases (N=3 studies).\(^{105,126,127}\) Changes in clinical management were not uniformly reported.

**Chest X-Ray:** Routine chest x-rays findings were reported as abnormal in 2.5-60.1% of cases (N=20 studies)\(^{96,98,100,102,128-142}\) and led to changes in clinical management in 0%-51% of the cases found to be abnormal (N=9 studies).\(^{100,102,128,129,136,139-142}\) For patients with indicated preoperative chest x-rays, abnormal findings were reported in 7.7-65.4% of cases (N=18 studies)\(^{30,82,92,100,106,112,128,137,143-152}\) and led to changes in clinical management in 0.5-74.3% of the cases found to be abnormal (N=9 studies).\(^{82,100,112,128,143,145-147,152}\) Two nonrandomized studies compared asymptomatic patients
receiving chest x-rays versus asymptomatic patients not receiving chest x-rays and found no differences in delays or cancellations of surgery.\textsuperscript{141,142} However, the studies found that an abnormal preoperative chest x-ray finding altered care in 8.6\% and 9.9\% of the cases found to be abnormal.

**Pulmonary Evaluation (i.e., Pulmonary Function Tests, Spirometry):** Studies examining routine pulmonary function tests (PFT's) did not contain data on abnormal findings (N=2).\textsuperscript{46,153} Studies examining routine preoperative spirometry reported abnormal findings in 15.0-51.7\% of cases (N=3 studies).\textsuperscript{154-156} Findings for indicated preoperative PFT's were reported as abnormal in 17.0-27.1\% of cases (N=3 studies),\textsuperscript{157-159} and indicated preoperative spirometry (a limited form of PFT's) were reported as abnormal in 33.1-45.0\% of cases (N=3 studies).\textsuperscript{30,157,160} Changes in clinical management were not reported. No studies were found that reported results of routine preanesthetic office spirometry (i.e. portable or hand held spirometers).

**Hemoglobin/Hematocrit Measurement:** Routine hemoglobin measurements were reported as abnormal in 0.5-43.8\% of cases (N=7 studies)\textsuperscript{102,133,161-165} and led to changes in clinical management in 0\%-28.6\% of the cases found to be abnormal (N=3 studies).\textsuperscript{102,161,164} Indicated hemoglobin measurements were reported as abnormal in 38.6-62.0\% of cases (N=2 studies).\textsuperscript{166,167} Changes in clinical management were not reported. Routine hematocrit measurements were reported as abnormal in 0.2-38.9\% of cases (N=5 studies)\textsuperscript{136,162,168-170} and led to changes in clinical management in 0\%-100.0\% of the cases found to be abnormal (N=3 studies).\textsuperscript{136,168,170} Indicated hematocrit measurements were reported as abnormal in 0.4-5.0\% of cases (N=2 studies).\textsuperscript{51,148} Changes in clinical management were not reported. In studies reporting routine complete blood counts (i.e., individual test results not reported), abnormal findings were reported in 2.9-17.6\% of cases (N=4 studies)\textsuperscript{92,98,171-172} and led to changes in clinical management in 2.4\% of the cases found to be abnormal (N=1 study).\textsuperscript{172} For indicated complete blood counts, abnormal findings were reported in 6.3-60.8\% of cases (N=4 studies)\textsuperscript{92,107,108,112} and led to changes in clinical management in 0.0\%-14.9\% of the cases found to be abnormal (N=2 studies).\textsuperscript{108,112}

**Coagulation Studies:** Routine coagulation studies reported abnormalities in bleeding time, prothrombin time, partial prothrombin time, or platelet count in 0.8-22.0\% of cases
and led to changes in clinical management in 1.1-4.0% of the cases found to be abnormal (N=2 studies).\textsuperscript{13, 136} Findings for indicated coagulation studies were reported as abnormal in 3.4-29.1% of cases (N=4 studies).\textsuperscript{183, 185-187} Changes in clinical management were not reported. The incidence of routine coagulation study abnormalities in patients scheduled for regional anesthesia or postoperative analgesia in surgical patients has not been reported. The incidence of routine coagulation study abnormalities in obstetric patients has not been reported.

**Serum Chemistries:** In routine preoperative potassium tests, abnormal levels of potassium were found in 1.5-12.8% of cases (N=3 studies).\textsuperscript{133, 162, 188} For indicated potassium tests, abnormal levels were found in 1.0-29.5% of cases (N=4 studies).\textsuperscript{51, 148, 189, 190} One randomized clinical trial compared preoperative serum potassium levels at induction with serum potassium levels three days prior to surgery, and found lower potassium levels (hypokalemia) at induction.\textsuperscript{188} No blinded studies were found that assessed the benefits or harms of practitioner awareness of potassium abnormalities.

In routine preoperative glucose tests in nondiabetic patients or patients without altered glucose metabolism, abnormal levels of glucose were found in 5.4-13.8% of cases (N=3 studies).\textsuperscript{133, 162, 171} Changes in clinical management were not reported.

**Urine Testing:** In routine preoperative urinalysis (not including pregnancy testing), abnormal results were reported in 0.7-38.0% of cases (N=9 studies)\textsuperscript{92, 96, 102, 136, 162, 170, 172, 191, 192} and led to changes in clinical management in 2.3-100.0% of the cases found to be abnormal (N=6 studies).\textsuperscript{102, 108, 112, 136, 162, 170, 172, 191, 192} For indicated urinalysis, abnormal results were found in 4.6-42.0% of cases (N=4 studies)\textsuperscript{92, 108, 112, 148} and led to changes in clinical management in 0.0-23.1% of the cases found to be abnormal (N=2 studies).\textsuperscript{108, 112}

**Pregnancy Testing:** Routine pregnancy tests (routine refers to premenopausal menstruating females, not excluding anyone on the basis of history) resulted in positive findings in 0.3-2.2% of cases (N=5 studies)\textsuperscript{193-197} and led to changes in clinical management, delays or cancellation of surgery in 100.0% of the cases found to be pregnant.

Consultants and ASA members were asked to consider whether specific preoperative tests should be conducted: 1) on a routine basis (i.e., given to patients regardless of known or suspected
diseases or disorders), 2) for selected patients or for selected types of surgery, or 3) the test is not necessary. For the tests considered, consultant and ASA membership responses are reported in Table 3. Consultants and ASA members were also asked to identify specific patient characteristics that would favor a decision to order, require, or perform a preoperative test. For these specific patient characteristics, consultant and ASA membership responses are reported in Table 4.

Consultants and ASA members were asked whether or not selected preoperative tests are acceptable if obtained from the patient's medical chart, assuming the patient's medical history has not changed substantially since the test was obtained. Majority opinions of Consultants and ASA members are reported as percentage agreement, respectively, as follows:

- ECG (99%, 98%)
- Other cardiac evaluation (94%, 98%)
- Chest x-ray (97%, 92%)
- Hemoglobin/ hematocrit (99%, 96%)
- Coagulation studies (86%, 98%)
- Serum chemistries (96%, 98%).

Respondents who agreed that test findings might be obtained from a patient's medical chart were asked how recent the findings should be in order to be acceptable. Opinions on how recent test findings should be are reported in Table 5.

Advisory

A. Routine Preoperative Testing.

The current literature is not sufficiently rigorous to permit an unambiguous assessment of the clinical benefits or harms of routine preoperative tests. The studies examined by the Task Force reported a wide range of abnormal results associated with preoperative testing. When abnormal or positive results were found, the percentage of patients with subsequent changes in their clinical management varied widely.
The Task Force agrees with the consultants and ASA members that preoperative tests should not be ordered routinely. The Task Force agrees that 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. Public commentary from open forums corroborates the Task Force consensus.

B. Preoperative Testing in the Presence of Specific Clinical Characteristics.

The current literature is not sufficiently rigorous to permit an unambiguous assessment of the clinical benefits or harms associated with selected preoperative test findings. The studies examined by the Task Force reported a wide range of abnormal preoperative test results. In addition, when abnormal or positive results were found, the percentage of patients with subsequent changes in their clinical management varied widely. Few randomized controlled trials were found that examined the outcomes of patients who had routine preoperative tests as compared to outcomes for patients with indicated preoperative tests. The Task Force believes that there is insufficient evidence to identify explicit decision parameters or “rules” for ordering preoperative tests on the basis of specific clinical characteristics. However, the Task Force believes that 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 their consideration only to those suggested below.

Electrocardiogram (ECG): The Task Force agrees that important clinical characteristics may include cardiocirculatory disease, respiratory disease and type or invasiveness of surgery. The Task Force recognizes that electrocardiogram abnormalities may be higher in older patients and in patients with multiple cardiac risk factors. No consensus was obtained from the consultants and ASA membership regarding a minimum age for obtaining a preanesthesia ECG. The Task Force did not reach consensus on a specific minimum age in those patients without specific risk factors. The Task Force recognizes that age alone may not be an indication for ECG. The Task Force agrees that 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.

**Prenesthesia Cardiac Evaluation (other than ECG):** Prenesthesia cardiac evaluation may include consultation with specialists and ordering, requiring or performing tests which range from non-invasive passive or provocative screening tests (e.g. stress testing) to non-invasive 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.

**Prenesthesia Chest Radiographs (X-Ray):** Clinical characteristics to consider include smoking, recent upper respiratory infection, 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.

**Prenesthesia Pulmonary Evaluation (Other than Chest X-ray):** Prenesthesia pulmonary evaluation other than chest x-ray may include consultation with specialists and tests which range from non-invasive 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 that the Task Force felt should be considered include type and invasiveness of the surgical procedure, interval from prior evaluation, treated or symptomatic asthma, symptomatic COPD, and scoliosis with restrictive function.

**Prenesthesia Hemoglobin or Hematocrit:** The consensus and Task Force reiterates that routine hemoglobin or hematocrit is not indicated. Clinical characteristics to consider as indications for such tests include type and invasiveness of procedure, patients with liver disease, extremes of age, history of anemia, bleeding and other hematological disorders.

**Prenesthesia Coagulation Studies (e.g., INR, PT, PTT, platelets):** 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 felt there were not enough data to comment on the advisability of coagulation tests prior to regional anesthesia. The Task Force strongly
ASA Practice Advisory for Preanesthesia Evaluation

recommends appropriately controlled studies of such specific indications.

*Preanesthesia Serum Chemistries (i.e., potassium, glucose, sodium, renal and liver function studies):* The Task Force recognizes that laboratory values may differ from normal values at extremes of age. Clinical characteristics to consider before ordering such tests include likely perioperative therapies, endocrine disorders, risk of renal and liver dysfunction, and use of certain medications or alternative therapies.

*Preanesthesia Urinalysis:* The consensus of the Task Force is that urinalysis is not indicated except for specific procedures (e.g., prosthesis implantation, urologic procedures) or urinary tract symptoms are present.

*Preanesthesia Pregnancy Testing:* The Task Force recognizes that 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.

C. **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. The Task Force believes that there is insufficient evidence to identify explicit decision parameters or “rules” for ordering preoperative tests on the basis of specific patient factors.

The Task Force agrees that test results obtained from the medical record within 6 months of surgery are generally 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 results may play a role in the selection of a specific anesthetic technique (e.g. regional anesthesia in the setting of anticoagulation therapy.) Public commentary from open forums and from the Internet corroborates the Task Force consensus.

III. **Summary and Conclusions.**

A *preanesthesia evaluation* involves the assessment of information from multiple sources, including medical records, patient interviews, physical examinations, and findings from preoperative tests.
The current scientific literature does not contain sufficiently rigorous information about the components of a preanesthetic evaluation to permit recommendations that are unambiguously based. Therefore, the Task Force has relied primarily upon noncontrolled literature, opinion surveys of consultants, and surveys of a random sample of members of the American Society of Anesthesiologists. The focus of opinion surveys has been threefold: 1) the content of the preanesthetic evaluation, 2) the timing of the preoperative evaluation, and 3) the indications for specific preoperative tests.

The following remarks represent a synthesis of the opinion surveys, literature and Task Force consensus:

- **Content** of the preanesthetic evaluation includes but is not limited to 1) readily accessible medical records, 2) patient interview, 3) a directed pre-anesthesia examination, 4) preoperative tests when indicated, and 5) other consultations when appropriate. *At a minimum*, a directed preanesthetic 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 and summarized below:

<table>
<thead>
<tr>
<th>Surgical Invasiveness</th>
<th>Severity of Disease</th>
<th>Timing of Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>High surgical invasiveness</td>
<td>Any severity of disease</td>
<td>Prior to day of surgery</td>
</tr>
<tr>
<td>Any surgical invasiveness</td>
<td>High severity of disease</td>
<td>Prior to day of surgery</td>
</tr>
<tr>
<td>Low or moderate surgical invasiveness</td>
<td>Low severity of disease</td>
<td>On or before day of surgery</td>
</tr>
</tbody>
</table>

The task force cautions that limitations in resources available to a specific health care system or practice environment may impact the timing of the preanesthetic evaluation.
The health care 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** or “rules” for specific preoperative tests or for the timing of preoperative tests cannot be unequivocally determined from the available scientific literature. Further research is needed, preferably in the form of appropriately randomized clinical trials. 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.

**References:**


imaging for prediction of perioperative events in clinically selected high cardiac risk patients having abdominal aortic surgery. Am J Cardiol 77:143-148, 1996


140. Tape TG, Mushlin AI: How useful are routine chest X rays of preoperative patients at risk for postoperative chest disease. J Gen Intern Med 3:15-20, 1988
150. Tornebrandt K, Fletcher R: Pre-operative chest X-rays in elderly patients. Anaesthesia 37:901-902, 1982


* The above references do not represent a complete bibliography of the literature reviewed. A complete bibliography is available by writing to the American Society of Anesthesiologists.
### Table 1

**Timing of the Initial Assessment of Pertinent Medical Records**

<table>
<thead>
<tr>
<th>Surgical Invasiveness</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(N=72)</td>
<td>(N=234)</td>
<td>(N=72)</td>
</tr>
<tr>
<td>Prior to day of surgery:</td>
<td>89%</td>
<td>75%</td>
<td>58%</td>
</tr>
<tr>
<td>On or before day of surgery:</td>
<td>11%</td>
<td>24%</td>
<td>39%</td>
</tr>
<tr>
<td>Only on day of surgery:</td>
<td>0%</td>
<td>1%</td>
<td>3%</td>
</tr>
</tbody>
</table>
### Table 2

#### Timing of the Preanesthetic Interview and Physical Examination

<table>
<thead>
<tr>
<th>High severity of disease</th>
<th>Surgical Invasiveness</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Consultants Members</td>
<td>(N=72)</td>
<td>(N=232)</td>
<td>(N=72)</td>
</tr>
<tr>
<td>Prior to day of surgery:</td>
<td>96% 89%</td>
<td>94% 69%</td>
<td>71% 53%</td>
<td>4% 9%</td>
</tr>
<tr>
<td>On or before day of surgery:</td>
<td>4% 9%</td>
<td>4% 28%</td>
<td>24% 32%</td>
<td>11% 20%</td>
</tr>
<tr>
<td>Only on day of surgery:</td>
<td>0% 2%</td>
<td>1% 3%</td>
<td>5% 15%</td>
<td>15% 11%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Low severity of disease</th>
<th>Surgical Invasiveness</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultants Members</td>
<td>(N=72)</td>
<td>(N=229)</td>
<td>(N=72)</td>
<td>(N=229)</td>
</tr>
<tr>
<td>Prior to day of surgery:</td>
<td>72% 53%</td>
<td>29% 21%</td>
<td>13% 25%</td>
<td>11% 20%</td>
</tr>
</tbody>
</table>
### Table 3

**Routine or Selective Preoperative Testing**

<table>
<thead>
<tr>
<th>Preoperative Test</th>
<th>All Patients (Routine)</th>
<th>Selected Patients</th>
<th>Test Not Necessary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Agreement*</td>
<td>% Agreement</td>
<td>% Agreement</td>
</tr>
<tr>
<td><strong>ECG</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consultants (N=72):</td>
<td>0</td>
<td>100%</td>
<td>0</td>
</tr>
<tr>
<td>ASA Members (N=233):</td>
<td>1%</td>
<td>98%</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Cardiac Tests other than ECG</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consultants (N=72):</td>
<td>0</td>
<td>97%</td>
<td>0</td>
</tr>
<tr>
<td>ASA Members (N=233):</td>
<td>1%</td>
<td>99%</td>
<td>0</td>
</tr>
<tr>
<td><strong>Chest X-Rays</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consultants (N=72):</td>
<td>3%</td>
<td>90%</td>
<td>7%</td>
</tr>
<tr>
<td>ASA Members (N=233):</td>
<td>1%</td>
<td>92%</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Pulmonary Function Tests</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consultants (N=42):</td>
<td>0</td>
<td>98%</td>
<td>2%</td>
</tr>
<tr>
<td>ASA Members (N=234):</td>
<td>0</td>
<td>96%</td>
<td>3%</td>
</tr>
<tr>
<td><strong>Office Spirometry</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consultants (N=42):</td>
<td>0</td>
<td>88%</td>
<td>10%</td>
</tr>
<tr>
<td>ASA Members (N=234):</td>
<td>1%</td>
<td>63%</td>
<td>20%</td>
</tr>
</tbody>
</table>

**Hemoglobin/Hematocrit**
### Coagulation Studies

<table>
<thead>
<tr>
<th>Consultants (N=72)</th>
<th>ASA Members (N=234)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3%</td>
<td>96%</td>
</tr>
<tr>
<td></td>
<td>1%</td>
</tr>
</tbody>
</table>

### Serum Chemistries

<table>
<thead>
<tr>
<th>Consultants (N=72)</th>
<th>ASA Members (N=234)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>99%</td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

### Urinalysis

<table>
<thead>
<tr>
<th>Consultants (N=72)</th>
<th>ASA Members (N=233)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>53%</td>
<td>47%</td>
</tr>
<tr>
<td>46%</td>
<td>49%</td>
</tr>
</tbody>
</table>

### Pregnancy Test

<table>
<thead>
<tr>
<th>Consultants (N=72)</th>
<th>ASA Members (N=232)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7%</td>
<td>17%</td>
</tr>
<tr>
<td>88%</td>
<td>78%</td>
</tr>
<tr>
<td>5%</td>
<td>3%</td>
</tr>
</tbody>
</table>

* Row percentages do not include "don't know" responses, therefore row totals may not sum to 100%
### Table 4

**Patient Characteristics for Selected Preoperative Testing**

<table>
<thead>
<tr>
<th>Preoperative Test</th>
<th>Patient Characteristics</th>
<th>Consultants (N=72)</th>
<th>ASA Members (N=234)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrocardiogram:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced age</td>
<td>93%</td>
<td>94%</td>
<td></td>
</tr>
<tr>
<td>Cardiocirculatory disease</td>
<td>97%</td>
<td>98%</td>
<td></td>
</tr>
<tr>
<td>Respiratory disease</td>
<td>74%</td>
<td>74%</td>
<td></td>
</tr>
<tr>
<td>Other cardiac evaluation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(e.g. stress test):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiovascular compromise</td>
<td>88%</td>
<td>95%</td>
<td></td>
</tr>
<tr>
<td>Chest radiograph:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recent upper respiratory infection</td>
<td>45%</td>
<td>59%</td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td>42%</td>
<td>60%</td>
<td></td>
</tr>
<tr>
<td>COPD</td>
<td>71%</td>
<td>76%</td>
<td></td>
</tr>
<tr>
<td>Cardiac disease</td>
<td>62%</td>
<td>75%</td>
<td></td>
</tr>
<tr>
<td>Pulmonary function tests:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reactive airway disease</td>
<td>68%</td>
<td>71%</td>
<td></td>
</tr>
<tr>
<td>COPD</td>
<td>80%</td>
<td>89%</td>
<td></td>
</tr>
<tr>
<td>Scoliosis</td>
<td>53%</td>
<td>60%</td>
<td></td>
</tr>
<tr>
<td>Office spirometry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i.e. portable spirometer):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reactive airway disease</td>
<td>83%</td>
<td>86%</td>
<td></td>
</tr>
<tr>
<td>COPD</td>
<td>77%</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>Scoliosis</td>
<td>51%</td>
<td>52%</td>
<td></td>
</tr>
<tr>
<td>Hemoglobin/hematocrit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced age</td>
<td>57%</td>
<td>68%</td>
<td></td>
</tr>
<tr>
<td>Very young age</td>
<td>52%</td>
<td>56%</td>
<td></td>
</tr>
<tr>
<td>Anemia</td>
<td>96%</td>
<td>99%</td>
<td></td>
</tr>
<tr>
<td>Bleeding disorders</td>
<td>93%</td>
<td>94%</td>
<td></td>
</tr>
</tbody>
</table>
ASA Practice Advisory for Preanesthesia Evaluation

<table>
<thead>
<tr>
<th>Case Scenario</th>
<th>Percentage</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other hematological disorders</td>
<td>74%</td>
<td>84%</td>
</tr>
<tr>
<td>Coagulation studies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bleeding disorders</td>
<td>99%</td>
<td>98%</td>
</tr>
<tr>
<td>Renal dysfunction</td>
<td>40%</td>
<td>52%</td>
</tr>
<tr>
<td>Liver dysfunction</td>
<td>97%</td>
<td>91%</td>
</tr>
<tr>
<td>Anticoagulants</td>
<td>97%</td>
<td>96%</td>
</tr>
<tr>
<td>Serum chemistries (Na, K, CO₂, Cl, glucose)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endocrine disorders</td>
<td>93%</td>
<td>95%</td>
</tr>
<tr>
<td>Renal dysfunction</td>
<td>96%</td>
<td>98%</td>
</tr>
<tr>
<td>Medications</td>
<td>87%</td>
<td>89%</td>
</tr>
<tr>
<td>Pregnancy test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uncertain pregnancy history</td>
<td>84%</td>
<td>91%</td>
</tr>
<tr>
<td>History suggestive of current pregnancy</td>
<td>94%</td>
<td>96%</td>
</tr>
</tbody>
</table>
## Table 5

### Timing of Test Findings

<table>
<thead>
<tr>
<th>Preoperative Test</th>
<th>24 hr</th>
<th>48 hr</th>
<th>1 wk</th>
<th>2 wk</th>
<th>1 mo</th>
<th>3 mo</th>
<th>6 mo</th>
<th>1 yr</th>
<th>&gt;1 yr</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ECG</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consultants (N=72):</td>
<td>0</td>
<td>0</td>
<td>4%</td>
<td>-</td>
<td>31%</td>
<td>-</td>
<td>46%</td>
<td>19%</td>
<td>0</td>
</tr>
<tr>
<td>ASA Members (N=218):</td>
<td>1%</td>
<td>0</td>
<td>6%</td>
<td>-</td>
<td>34%</td>
<td>-</td>
<td>45%</td>
<td>12%</td>
<td>2%</td>
</tr>
<tr>
<td><strong>Other Cardiac Tests</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consultants (N=72):</td>
<td>0</td>
<td>0</td>
<td>5%</td>
<td>-</td>
<td>33%</td>
<td>-</td>
<td>27%</td>
<td>26%</td>
<td>10%</td>
</tr>
<tr>
<td>ASA Members (N=217):</td>
<td>0</td>
<td>0</td>
<td>7%</td>
<td>-</td>
<td>33%</td>
<td>-</td>
<td>40%</td>
<td>18%</td>
<td>4%</td>
</tr>
<tr>
<td><strong>Chest X-Ray</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consultants (N=72):</td>
<td>0</td>
<td>5%</td>
<td>5%</td>
<td>-</td>
<td>25%</td>
<td>23%</td>
<td>19%</td>
<td>23%</td>
<td>-</td>
</tr>
<tr>
<td>ASA Members (N=206):</td>
<td>0</td>
<td>2%</td>
<td>8%</td>
<td>-</td>
<td>27%</td>
<td>9%</td>
<td>31%</td>
<td>23%</td>
<td>-</td>
</tr>
<tr>
<td><strong>Hemoglobin/Hematocrit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consultants (N=72):</td>
<td>-</td>
<td>-</td>
<td>14%</td>
<td>8%</td>
<td>42%</td>
<td>23%</td>
<td>8%</td>
<td>5%</td>
<td>-</td>
</tr>
<tr>
<td>ASA Members (N=213):</td>
<td>-</td>
<td>-</td>
<td>13%</td>
<td>11%</td>
<td>46%</td>
<td>17%</td>
<td>11%</td>
<td>1%</td>
<td>-</td>
</tr>
<tr>
<td><strong>Coagulation Studies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consultants (N=42):</td>
<td>28%</td>
<td>11%</td>
<td>30%</td>
<td>6%</td>
<td>19%</td>
<td>6%</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ASA Members (N=194):</td>
<td>33%</td>
<td>16%</td>
<td>26%</td>
<td>6%</td>
<td>16%</td>
<td>4%</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Serum Chemistries**

---

ASA Practice Advisory for Preanesthesia Evaluation
ASA Practice Advisory for Preanesthesia Evaluation

<table>
<thead>
<tr>
<th></th>
<th>15%</th>
<th>7%</th>
<th>27%</th>
<th>17%</th>
<th>27%</th>
<th>7%</th>
<th>-</th>
<th>-</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultants (N=72):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASA Members (N=203):</td>
<td>11%</td>
<td>12%</td>
<td>26%</td>
<td>9%</td>
<td>34%</td>
<td>7%</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>