SPECIAL TOPIC

2012 American Academy of Cosmetic Surgery Review of Anesthesia Safety for the Cosmetic Surgeon

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Safety guidelines from many different medical specialties have been developed and are frequently used to establish a standard of care. The American Academy of Cosmetic Surgery appointed a committee to produce a review of anesthesia safety for cosmetic surgeons. This document is not intended to represent a standard of care, but reflects what the committee considers to be key elements of practice that benefit patient safety when anesthesia is being used as part of the practice of cosmetic surgery.

The following review discusses the use of anesthesia in connection with outpatient elective cosmetic surgery. In particular, these guidelines address issues of safety in mild to deep sedation as well as general anesthesia as applied in an outpatient setting. This review is based on a variety of sources, primarily taken from the peer-reviewed literature and guidelines produced by various accreditation agencies, including the American Accreditation Association for Ambulatory Health Care, the American Medical Association, the American Society of Anesthesiologists,1 and the American College of Surgeons,2 with an emphasis on the literature reflecting the highest available levels of evidence.

Preoperative Evaluation

The preoperative evaluation is the clinical assessment that precedes the delivery of anesthesia care for cosmetic surgery. This assessment includes the history and the physical examination as well as relevant available laboratory information. In combination these provide necessary information to help the cosmetic surgeon and anesthesia personnel make key decisions regarding anesthesia choices. This information also guides intraoperative and postoperative management.

The cosmetic surgeon should obtain a thorough medical history at the initial consultation, including information relevant to the cosmetic concerns and to the patient’s suitability for surgery and anesthesia. The preoperative history should include personal health history, identification of comorbidities, and a list of medications (prescription and nonprescription) and dosages, allergies or adverse reactions (eg, to medications, previous anesthesia, latex, and adhesive or tape) should be noted, and a social history, family history, and review of body systems should be conducted. The physical examination is essential for assessing the patient’s clinical status and should include an estimate of general health and appearance; measurement of height and weight; assessment of airway, lungs, and heart; and documentation of vital signs. A detailed examination of the anatomic area of the operation should also be included. See Appendix A for a sample medical history and physical form.

As part of the preoperative evaluation process, the surgeon may choose to consult with other healthcare professionals to obtain information or services relevant to the perioperative anesthetic care. Generally, the preoperative appointment should occur 1–3 weeks before the scheduled procedure to allow adequate time for required workup and clearances.
The use of a scale to define anesthesia risk is a common practice that is useful in determining the appropriate setting for anesthesia in surgical procedures. Accreditation status may define the anesthesia risk for a particular facility and recommend which scale is most appropriate. Although there have been no controlled trials of the clinical impact of performing preanesthesia medical record review or physical exam, such a practice is strongly recommended by accrediting agencies and by common practice within the guidelines of standards of care. In the absence of comorbidities or significant findings on history and examination, patients undergoing minor surgery, even with anesthesia, do not require laboratory evaluations. Several studies report specific perioperative outcomes occurring in patients with specific preexisting conditions (hypertension, previous myocardial infarction, smoking, pulmonary disease, and older age).3,4

**Timing**

The preoperative evaluation of the patient, consisting of a history, a physical exam, and any indicated laboratory or radiologic studies, can occur over a variable period of time, but most institutional guidelines and professional organizations recommend a period of time from 2 weeks to 2 months before the scheduled procedure. Although no controlled trials addressing the timing of the preanesthesia evaluation were found, survey opinions from expert consultants and a random sample of American Society of Anesthesiologist (ASA) members revealed that most consultants and ASA members agree that for medium to high surgical invasiveness, the initial assessment should be done before the day of surgery. For low surgical invasiveness, most consultants and ASA members agree that the initial assessment may be done on or before the day of surgery.3

**Selection of Preoperative Tests**

Routine tests are defined as tests ordered in the absence of a specific clinical indication. The global designation of “pre-op status” is not considered a specific clinical indication. An indicated test is defined as a test that is ordered for a specific clinical indication, such as assessment of warfarin therapy effects before surgery by a specific coagulation test. In general, cosmetic surgeons have to abide by the protocols and bylaws set by the institution in which they operate for their routine preoperative test(s), whether it is a hospital, ambulatory surgery center, or office-based surgical facility. Additional testing should be based on comorbidities, medications, and anticipated blood loss. Although an increasing body of evidence finds most routine testing to be inefficient and not beneficial, we will review some of the more common anesthesia-related preoperative tests that are often required by common practice and conducted before performing common cosmetic surgical procedures.4

**Hemoglobin and Hematocrit Measurement**

A complete blood count is probably the most common test ordered before surgery. In a review of studies of routine preoperative testing by Smetana and Macpherson,5 the positive likelihood ratio was modest (>3) for hemoglobin, electrolytes, and renal dysfunction tests but had a low impact for change on preoperative management. Normal preoperative test results did not indicate the likelihood of postoperative complications. A single-center study found that 50% of preoperative screening tests were unindicated but the lack of benefit did not reduce the amount of unwarranted testing. Other studies have shown that complete blood count results obtained within 3 months before a surgical procedure are valid and do not have to be repeated unless there are clinical indications, such as a history of fever, weight loss, anemia, or a bleeding disorder or a patient with liver disease.3,7

**Hemoglobin A1c (HbA1c)**

Glycosylated hemoglobin serves as a marker for average blood glucose levels over the previous months before the measurement and should be checked for every patient with diabetes. Elevated levels of hemoglobin A1c (HbA1c) indicate poorer control of blood glucose levels and have been associated with delayed wound healing and increased postoperative complications. In a recent consensus statement, however, the Society for Ambulatory Anesthesia concluded that there are insufficient data to specifically recommend the level of preoperative fasting glucose or HbA1c levels above which elective ambulatory surgery should be postponed.7

The American Diabetes Association recommends that outpatient management of diabetes should include a combination of a target HbA1c <7% (normal range is 4–7%), a preprandial blood glucose level of 90 to 130 mg/dL, and a peak postprandial glucose level of 180 mg/dL, although this has not been verified in the ambulatory surgical setting. When possible, patients with diabetes should be scheduled as the first case of
the day to minimize disruption to their routine and allow smooth and prompt return to their normal dosing regimen and meal plan.8

**ELECTROCARDIOGRAM**

Cosmetic surgeons should follow the protocol set by the institution in which they operate when obtaining preoperative electrocardiogram (ECG). No known randomized controlled trials specifically address the question of whether eliminating preoperative ECGs in patients without known risk factors for coronary disease, regardless of age, leads to an increase in adverse events. The available studies suggest that there continues to be some value in providing a baseline ECG in those patients older than 60 years.8 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.9 The available previous ECG can be invaluable if abnormalities are detected at the induction of anesthesia or during the course of surgery. Whether changes are old or acute may determine if surgery should proceed.9–12

**CHEST X-RAY**

A routine chest X-ray in an asymptomatic cosmetic surgery patient is of little value to the primary care physician, anesthesiologist, or cosmetic surgeon.13,14 Two nonrandomized studies compared asymptomatic patients receiving chest X-ray versus asymptomatic patients not receiving chest X-ray and found no differences in delays or cancellations of surgery. However, the studies did find that an abnormal preoperative chest X-ray finding altered care in 8.6% and 9.9% of patients, respectively. It is therefore the Cosmetic Surgery Safety Task Force’s recommendation that a chest X-ray be ordered based on clinical presentation and history.15,16

**SERUM CHEMISTRIES AND BLOOD GLUCOSE**

Serum chemistry panels, such as electrolyte and blood glucose tests, should be ordered according to the patient’s history and clinical findings. For example, patients with a history of hypertension or diabetes who are taking medication that can affect electrolyte and glucose levels should be tested. In addition, patients at risk of renal or liver dysfunction should have their electrolyte status evaluated. However, routine preoperative serum electrolyte and blood glucose tests on a healthy, asymptomatic patient have been shown to be of little value and require no change in clinical management.13–17

**URINE TESTING**

Urinalysis, one of the oldest and most revered tests in medicine, is no longer used as a routine anesthesia preoperative test. Indications for urinalysis are assessment of renal function, inflammation, and infection; intravascular volume status; and metabolic disorders. However, women at risk of urinary infection (eg, sexually active postmenopausal women who are undergoing implantation of a foreign body, such as a breast implant) should be screened and treated before surgery if evidence of urinary tract infection is found. When this test is conducted, it is important to use the correct method for patient preparation and urine collection and handling.18

**PREGNANCY TESTING**

A pregnancy test should be performed on all premenopausal menstruating women. Several testing options are available, and the surgeon should follow the institution’s protocol. Available assays are serum human chorionic gonadotropin (HCG) and urine HCG; B-HCG is detectable in maternal urine and blood 8 to 9 days after conception. In several studies, routine pregnancy testing resulted in positive findings in 0.3–2.2% of patients and led to changes in clinical management and delays or cancelations of surgery in 100% of the patients found to be pregnant.19–23

**COAGULATION STUDIES**

Coagulation testing or clotting function studies should not be routine but should be obtained in patients with known, suspected, or potential coagulopathies secondary to medical history and drug therapies.24 Clinical indications include patient or family history of bleeding disorders, use of anticoagulants or other drugs affecting coagulation, critical-risk surgical procedures with significant blood loss expected, hepatic disease, and malabsorption/poor nutrition. Coagulation testing or clotting function studies include prothrombin time, partial prothrombin time, international normalized ratio, and platelet count.

*Other Factors to Consider at the Preoperative Evaluation*

**AGE**

Advancing age by itself does not seem to be a contraindication to surgery. Studies conducted in a
hospital-based ambulatory surgical unit setting report conflicting findings as to whether older age contributes to the risk of intraoperative and/or postoperative complications associated with ambulatory surgery.25 A prospective cohort study of 17638 consecutive ambulatory surgery patients found that, compared with patients younger than 65 years, patients aged 65 years or older were 1.4 times more likely to experience an intraoperative event and 2.0 times more likely to experience an intraoperative cardiovascular event.26 In contrast, elderly patients had a much lower incidence of any postoperative event (adjusted odds ratio = 0.4), postoperative pain (adjusted odds ratio = 0.2), nausea and vomiting (adjusted odds ratio = 0.3), and dizziness (adjusted odds ratio = 0.4). Other studies have shown no effect of age on unanticipated hospital admission or postoperative complications.27,28

OBESITY

Studies performed in hospital-based ambulatory surgical units have found that obesity correlates with an increased likelihood of failed regional anesthetic block, wound infection, and complications, especially respiratory complications.29,30 In addition, data from nonsurgical settings indicate that obesity is an intrinsic risk factor that increases the odds of deep vein thrombosis 2.4-fold.31

In addition, airway management may be difficult in patients who are obese. The use of supplemental oxygen should be considered, and carefully sized airway adjuncts (eg, oral/nasal pharyngeal airways, endotracheal tubes, and laryngeal mask airways) should be immediately available for patients under moderate sedation or general anesthesia. Respiratory abnormalities necessitate proper patient positioning and monitoring. A semi-upright position of the operating table is recommended for patients under sedation because respiratory problems may be worsened in the supine position.

Caution should be used when developing an anesthetic plan for a patient who is obese and taking appetite suppressants or other medications. Opioids may need to be avoided in patients with respiratory problems who are obese because of their dose-dependent depression of ventilation and muscle-relaxing properties. If obstructive sleep apnea is diagnosed or suspected, opioids should be avoided or titrated carefully, and patients should be observed for extended postoperative monitoring. Nonopioid analgesics should be considered, as should moderate sedation with reversible agents.32,33

OBSTRUCTIVE SLEEP APNEA

No medical studies are available that discuss obstructive sleep apnea status and anesthesia in an ambulatory surgery center or office-based setting but it has been shown to result in a low incidence of unexpected hospitalization.34 However, the ASA guidelines in regards to perioperative management of patients with obstructive sleep apnea state that they are at increased risk for airway obstruction and respiratory depression, which may require a longer postoperative stay and monitoring.35 The Cosmetic Surgery Safety Task Force recommends that patients with known obstructive sleep apnea should be identified with an alert on their chart. During the recovery period they should be monitored closely. If they use a consistent positive airway pressure machine it should be available during the recovery period. The amount of narcotics medication prescribed for the postoperative period should be limited and closely monitored. Another helpful review regarding the postoperative care of patients with obstructive sleep apnea and obstructive lung disease was published by the American Society of Plastic Surgery Safety Committee.36

CARDIOVASCULAR CONDITIONS

Patients with various cardiovascular conditions such as hypertension, history of heart disease, and stroke are at increased risk of intraoperative hemorrhage and postoperative complications after ambulatory surgery.37,38 Studies have shown that patients with low-grade or distant cardiovascular symptoms (eg, angina pectoris or previous myocardial infarction occurring more than 6 months ago that was treated and is stable) are suitable candidates for ambulatory cosmetic surgery, whereas those with more severe conditions (eg, active angina, prior myocardial infarction within the past 6 months) are not. According to the College of Cardiology/American Heart Association guidelines,39,40 patients with active cardiac conditions should be evaluated and their treatment should be optimized before noncardiac surgery. Recent meta-analysis of the literature has found that prophylactic pretreatment with beta blockers confers no benefit, and should be abandoned.41

Patients with existing cardiac pacemakers or implantable cardioverter-defibrillators can be treated safely in consultation with the cardiologist and device manufacturer. These devices can be affected by electromagnetic interference from electrocautery or radiofrequency ablation. Recommendations vary depending on the type of device and the patient’s dependence on device
function. Consultation with the managing cardiologist or surgeon with identification of the device and its parameters and safeguards should be considered mandatory. Standard electrocautery devices should be avoided, but other options include use of a bipolar cautery device or ultrasonic (harmonic) scalpels.42

ANTICOAGULANT AND ANTIPLATELET MEDICATIONS

In general, continuing or discontinuing anticoagulant and antiplatelet medications before cosmetic surgery depends on the medical necessity of the agents for preventing cardiovascular events, thereby warranting consultation with a cardiologist, a hematologist, or an internist.43 A survey of expert opinion regarding continuation or withdrawal of aspirin before an invasive procedure found that most physicians would instruct patients with low thromboembolic risk to discontinue aspirin before the procedure and resume aspirin therapy once the bleeding risk has subsided. In contrast, in patients with high thromboembolic risk, the consensus was to continue aspirin, particularly in those procedures with a low bleeding risk. An additional option was to substitute low-molecular-weight heparin for aspirin before procedures with an intermediate to high risk of bleeding.44

MALIGNANT HYPERTERMIA

Malignant hyperthermia is a rare genetic disorder that can affect anesthetic planning, and its occurrence carries high mortality without use of dantrolene sodium. This first step in managing this potential risk is a thorough preoperative personal and family history.45 When the diagnosis of malignant hyperthermia susceptibility is in question, the standard means for determining susceptibility is the caffeine-halothane contracture test.46–49 Persons susceptible to malignant hyperthermia can undergo ambulatory surgery, provided that nontriggering anesthetics are used, inhalational anesthetics and succinylcholine are avoided, and patient temperature is carefully monitored postoperatively for a minimum of 2.5 hours.50 Pretreatment of susceptible patients with dantrolene is not recommended because it does not prevent triggering of malignant hyperthermia with general anesthesia and is therefore not cost-effective.51–54

Rather, it is the standard of care55 that the office-based surgery suite must have sufficient equipment (ie, pulse oximetry, capnography, temperature monitoring equipment, continuous electrocardiography, emergency resuscitative equipment), supplies (ie, sterile water sufficient to dilute dantrolium, D50, antiarrhythmics, calcium chloride, sodium bicarbonate, insulin, furosemide, and adequate ice), trained personnel, transfer and emergency protocols, and facility accreditation to treat a malignant hyperthermia emergency.54 The goal should be to stabilize the patient as soon as possible and transfer to an acute care facility to manage the rare condition.56

Table 1 provides a list of agents that can trigger malignant hyperthermia during anesthesia and Table 2 lists the agents considered safe for use in patients with malignant hyperthermia.

<table>
<thead>
<tr>
<th>Table 1. Agents to Avoid in Patients With Known Malignant Hyperthermia50,56</th>
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<tr>
<td><strong>Inhaled General Anesthetics</strong></td>
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<tr>
<td>• Chloroform (Trichloromethane, Methyltrichloride)</td>
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<td>• Cyclopropane</td>
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<td>• Desflurane</td>
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<td>• Enflurane</td>
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<td>• Isoflurane</td>
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<td>• Methoxyflurane</td>
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<tr>
<td>• Sevoflurane</td>
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<tr>
<td>• Trichloroethylene</td>
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<tr>
<td>• Xenon (rarely used)</td>
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<tr>
<td><strong>Depolarizing Muscle Relaxants That Trigger Malignant Hyperthermia</strong></td>
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<tr>
<td>• Succinylcholine</td>
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<td><strong>Drugs That Could Potentially Trigger Malignant Hyperthermia</strong></td>
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<tr>
<td>• D-Tubocurarine</td>
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<td>• Ether derivatives and chloroform</td>
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<tr>
<td>• Phosphodiesterase inhibitors (enoximone/methylxanthines in supertherapeutic doses)</td>
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<tr>
<td>• Rapid intravenous potassium</td>
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<td>• Theophylline and aminophylline (in supertherapeutic doses)</td>
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RISK OF VENOUS THROMBOEMBOLISM

Risk of venous thromboembolism (VTE) in cosmetic surgery is low but catastrophic when it occurs. It is important to inquire about personal and family
history of hypercoagulable state and preexistence of such disorders as venous insufficiency, chronic heart failure, obesity (body mass index of 30, calculated as kg/m²), standing for more than 6 hours per day, a history of more than 3 pregnancies, current pregnancy, muscular trauma, deterioration in general condition, confinement to a bed and/or armchair, long distance travel, and infectious disease. Numerous studies correlate increased risk of VTE with use of general anesthesia during surgery and performance of abdominoplasty with or without another procedure.\(^{57}\)

Table 2. Agents Safe to Use in Patients With Known Malignant Hyperthermia\(^{50,56}\)

- Anticholinergics
- Anticholinesterases
- Barbiturates (eg, thiopental)
- Benzodiazepines
- Droperidol
- Etomidate
- Ketamine
- Local anesthetics (both ester and amide type)
- Narcotics
- Nitrous oxide
- Nondepolarizing muscle relaxants (eg, vecuronium, rocuronium, pancuronium, atracurium, mivacurium, cisatracurium)
- Nonsteroidal antiinflammatory drugs
- Propofol

Based on the current guidelines of the American College of Chest Physicians,\(^{58}\) the Cosmetic Surgery Safety Task Force recommends risk stratification for cosmetic surgery patients, classifying their risk of VTE as low, moderate, or high risk. These conditions are identified in Table 3.

Table 3. Currently Identified Health-Related Risk Factors for Deep Vein Thrombosis\(^{57-61}\)

- Age >50 years
- Myeloproliferative disorder
- Dehydration
- Congestive heart failure
- Active malignancy
- Hormonal replacement
- Recent postpartum with immobility
- Moderate to major surgery
- Prior history of venous thromboembolism
- Impaired mobility
- Inflammatory bowel disease
- Active rheumatic disease
- Sickle cell disease
- Myocardial infarction
- Use of estrogen-based contraceptives
- Central venous catheter
- Acute or chronic lung disease
- Obesit
- Known thrombophilic state
- Varicose veins/chronic stasis
- Nephrotic syndrome

Table 4 identifies the criteria for patients at low, moderate, or high risk for VTE. In general, treatment recommendations are based on the intrinsic risks associated with the patient’s general health and the risks associated with specific surgical procedures.

Although there is substantial evidence regarding the use of combined anticoagulant and mechanical preventive measures for many types of procedures,\(^{62,63}\) such analysis does not exist for cosmetic surgery. Specific recommendations can be safely made for preventive strategies that emphasize careful positioning during surgery (with slightly flexed knees) and use of pneumatic compression devices and compression stockings.\(^{64,65}\) Unfortunately, the best evidence combining use of anticoagulants and mechanical measures exists primarily in the orthopedic literature.\(^{61,62,66}\)

In the absence of strong evidence related to deep vein thrombosis and VTE prophylaxis in cosmetic surgery, one can assume that extended abdominoplasty, combined procedures with liposuction, procedures of extended duration, and procedures in high-risk patients are similar in their physiological stress and effects on the coagulation cascade, venous stasis, and other factors; thus, use of such stratification is justified and patients may be treated with an appropriate anticoagulant, when indicated. Cosmetic surgeons should exercise
clinical judgment in weighing the risk of VTE versus the risk of intraoperative and/or postoperative bleeding or hematoma. They should limit the duration of surgery and be selective in combining multiple unrelated procedures in high-risk categories. For a more detailed discussion, refer to the American College of Chest Surgeons panel’s review and recommendation on VTE prophylaxis.

**MULTIPLE PROCEDURES**

Performing multiple cosmetic surgical procedures in concert has been proven safe in ambulatory settings; however, the combined effect of multiple procedures may increase the likelihood of complications and prolonged recovery. Extensive publicity regarding combined procedures, especially those associated with liposuction and resulting in death, has led to state-by-state regulations regarding location of procedures, accreditation requirements in some cases, limits on the maximum liposuction aspirate permitted, and other measures designed to protect the public. Extensive publicity regarding combined procedures, especially those associated with liposuction and resulting in death, has led to state-by-state regulations regarding location of procedures, accreditation requirements in some cases, limits on the maximum liposuction aspirate permitted, and other measures designed to protect the public.74–77

**Recommendations:** The Cosmetic Surgery Safety Task Force agrees that liposuction should be relatively restricted in combination with multiple unrelated procedures. The actual volume of liposuction aspirate that can be safely removed during a combined procedure is as yet unknown, and there is no national consensus on the limitation of total liposuction aspirate when combined with other procedures. Cosmetic surgeons should consult with their individual state in regard to such regulations.

**DURATION OF THE PROCEDURE**

Length of surgery has been associated with prolonged postanesthesia care and increased likelihood of unplanned hospital admissions. In a prospective study by Fortier et al of 15 000 patients in a hospital ambulatory surgical setting, it was determined that anesthesia for more than 1 hour or surgical procedures ending after 3 PM were significant independent predictors of unanticipated postoperative hospital admissions. However, even though most ambulatory cosmetic surgical procedures last longer than 2 hours, there is evidence to support the safety of performing cosmetic surgical procedures lasting longer than 2 hours with no increased delay of discharge time or rate of hospital admission. In a prospective study, a group of British plastic surgeons found an increased morbidity associated with prolonged operative times longer than 6 hours and therefore recommended that elective procedures should be limited to no longer than 6 hours. Despite these recommendations, the authors state that duration of surgery alone is not a major determinant of postoperative morbidity but the type of surgery performed and the patient’s general health are more important predictors of outcome. These recommendations are becoming standard for ambulatory settings in which complex procedures may be done, yet there is an absence of real evidence that this time limit has meaning.82,83 Recent studies do correlate length of surgery with surgical site infection, however, so it should be considered when planning combined procedures.84 Lengthy, complex, or combined procedures should be scheduled early enough in the day to allow for adequate patient recovery. Patient-related factors should be considered when scheduling such patients, such as body mass index, risk of VTE, obstructive sleep apnea, and preoperative cardiac and pulmonary status. Every effort should be made to ensure that the patient undergoing ambulatory surgery is a good candidate for that location, that the procedure is appropriate for that site, and that the conditions ensure patient safety during their entire stay.

**Recommendations:** The selection of patients for procedures requiring anesthesia requires attention to the multiple conditions that may adversely affect the outcome. The Cosmetic Surgery Safety Task Force endorses the practice of risk identification in all of the conditions discussed in this section and recommends that careful consideration of the relative risk versus benefit related to each of these categories be considered during the presurgical planning process.

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**Table 4. Stratification for Venous Thromboembolism Risk Assessment**

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Low Risk</th>
<th>Moderate Risk</th>
<th>High Risk</th>
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<tbody>
<tr>
<td>Inclusion criteria</td>
<td>Ambulatory patient</td>
<td>Patient not in low- or high-risk categories</td>
<td>Specific orthopedic and surgery conditions not identified with cosmetic surgery</td>
</tr>
<tr>
<td></td>
<td>Hospital stay &lt;2 days</td>
<td>Patient aged 40 years or older</td>
<td>Malignancy</td>
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<td></td>
<td>Minor surgery (less than 30 minutes)</td>
<td>Surgery longer than 30 minutes</td>
<td>Prolonged immobilization</td>
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<td></td>
<td>No additional risk factors</td>
<td>Use of estrogen-based oral contraceptive or hormone replacement therapy</td>
<td>Obesity</td>
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<td></td>
<td></td>
<td></td>
<td>Hypercoagulable state</td>
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Further, documenting appropriate consultation and decisions related to continuing, instituting, or discontinuing treatments and preventive activities is strongly recommended.85

**Types of Anesthesia and Documentation**

The definitions of the types and stages of anesthesia generally referred to are incorporated in Appendix B. There is no consensus as to which anesthetic modality is preferable for any single procedure. With the introduction of tumescent anesthesia, the opportunity for use of local anesthesia has expanded greatly. Standards for the level of patient monitoring required for each type of anesthesia have been set by accreditation agencies and the ASA. The Cosmetic Surgery Safety Task Force has no comments regarding these criteria, other than to support the standards as they apply.85–91 Appendix C summarizes these recommendations and includes criteria for documentation, necessary equipment, and monitoring standards as well as a sample anesthesia form. Appendix D identifies the level of monitoring recommended with each level of anesthesia. Appendices E and F summarize the recommended rating systems for evaluating anesthesia risk.

**Recommendations:** The Cosmetic Surgery Safety Task Force endorses the principle that all cosmetic surgery that is being done under moderate or deeper sedation or general anesthesia should be performed in an accredited surgical facility and that anesthesia providers need to meet the criteria of certification recognized by the ASA.83,91 Physicians who perform office-based surgery with moderate sedation/analgesia, deep sedation/analgesia, or general anesthesia should have their facilities accredited by one of the following accrediting bodies that are recognized by the American Academy of Cosmetic Surgery:

1. The Joint Commission
2. Accreditation Association for Ambulatory Health Care
3. American Association for Accreditation of Ambulatory Surgical Facilities
4. A state recognized entity, such as the Institute for Medical Quality
5. A federal recognized entity, such as Medicare

**Surgical and Operating Room Safety**

**Operating Facility Accreditation Standards**

Many states now require mandatory accreditation of outpatient surgical facilities; and it is anticipated that this trend will continue in the future. As the American Academy of Cosmetic Surgery is affiliated with Accreditation Association for Ambulatory Health Care Inc, its standards are specifically referenced as part of these guidelines where applicable to surgical and recovery care.85

An accredited operating room should include all the recommended components of an environment that ensures patient safety, including attention to sterile technique; appropriate equipment, supplies, and pharmaceuticals related to the procedures being performed; and staffing expertise that ensures compliance with accreditation and state regulations. The physical facility should meet standards as set by the state and accreditation agency. This section will add some considerations that will further ensure patient safety.

**Use of the Surgical Checklist**

“Preventable surgical injuries and deaths are a growing concern,” said Dr Margaret Chan, director-general of the World Health Organization. “Using the checklist is the best way to reduce surgical errors and improve patient safety.”92 Although the concept of the surgical checklist is quite new, its value in reducing errors related to anesthesia and surgery have been well documented.93

The World Health Organization checklist identifies 3 phases of an operation, each corresponding to a specific period in the normal flow of work: before the induction of anesthesia (“sign in”), before the skin incision is performed (“time out”), and before the patient leaves the operating room (“sign out”). In each phase, a checklist coordinator must confirm that the surgical team has completed the listed tasks before the operation proceeds. (See Appendix G.)

The time out occurs when the patient arrives in the operating room and before he or she is moved from the bed to the operating table. All members of the operating room team must cease all activity and focus their attention on the patient. The surgeon usually states the type of surgery to be performed and the site of surgery, which should already have been marked before entering the operating room. Next, the surgeon announces that all the equipment necessary (ie, implants) for the procedure is present and that the patient is in the correct position so that the surgery may be performed without difficulty. The anesthesiologist announces the type of anesthetic and then confirms the position in which the patient will be placed, the padding of the patient to prevent injury while under the effects of anesthesia, the medications that
were administered to the patient before entering the operating room, and the monitors that will be used to measure the patient’s vital signs. The cascade reporting continues until all involved in the surgery have voiced their respective obligations or concerns.

This very simple process, which takes minutes, has already reduced errors and inefficiencies such as operating on the wrong patient, performing the wrong type of surgery, operating on the wrong surgical site, overlooking medication allergies, and leaving surgical instruments in a patient. Although such mistakes do not commonly occur, when they do, the results can be catastrophic. For a detailed discussion of how the checklist was developed, see Haynes et al.93 For a complete picture of the background in adopting this practice worldwide, we recommend reading Checklist Manifesto by Dr Atul Gawande.94 A well-written summary of patient safety initiatives in the operating room can also be found in the article “Patient safety in the operating room.”95

Recommendations: The Cosmetic Surgery Safety Task Force endorses the use of checklists in the operating room. It also recommends that each surgeon identify those elements that are relevant to his or her practice, and customize checklists for maximum benefit.

Operating Room Fires

Operating room fires occur as a result of 3 components that are always present in an operating room: an oxygen-enriched environment, combustible materials, and an ignition source. These are each closely related to anesthesia, surgical draping, and such things as electrocautery or laser use. Anesthesia provides the oxygen. Surgical equipment provides the ignition source in the form of uninsulated cords coming into the surgical field for lighted retractors, lasers, heated probes, drills, electrocautery, and other such devices. The surgical drapes, gauze, or instrument wrapping material provide the fuel. Prepping agents such as alcohol and some ointments may also be volatile.

Anesthesia usually involves the delivery of oxygen-enriched mixtures above the 21% oxygen of room air to ensure proper oxygenation of the patient. Because oxygen is heavier than air, it collects in low-lying areas (eg, open chest cavity, drape folds). Some materials, such as some drape fabrics, absorb and retain oxygen for some time. The most common fire hazards are found in head and neck procedures where the surgical field excludes the airway, especially in conscious sedation cases, which allows oxygen to accumulate beneath the drapes. Open draping is one way to avoid this.96

Current recommendations from the Anesthesia Patient Safety Foundation97 and the Emergency Care Research Institute98 focus on 3 specific fire reduction strategies:

1. Open oxygen delivery should be used during procedures on the head, face, neck, and upper chest.
2. Follow specific recommendations regarding the use of supplemental oxygen during such procedures.
3. Implementation of a preoperative time-out is strongly recommended to assess fire risk potential for every patient and surgery.

Of greatest importance are the recommendations regarding the use of supplemental oxygen, a common necessity in cosmetic surgery using sedation. The groups’ strongest recommendation is to discontinue use of 100% supplemental oxygen during head, face, neck, and upper chest surgery.99 If medical air is insufficient, and intubation or laryngeal mask is undesirable, the alternative is to use the lowest oxygen concentration possible. If higher concentrations are needed, 3 steps should be followed before using cautery or other energy devices:

1. The surgeon should alert the anesthesia provider that cautery, laser, or another energy source will be used.
2. The flow of oxygen should be discontinued for at least 1 minute, and medical air at 5–10 L/minute should be delivered during that time.
3. Drapes should be open to prevent accumulation of oxygen below them. Moist towels may be placed around the area of the surgery to further reduce risk.

An excellent poster, available in English or Spanish, outlines these preventive strategies.100

In addition to fire prevention, preparation for fire suppression is necessary.101

In the event of fire, the following equipment should be available:

- Containers of sterile saline
- A carbon dioxide fire extinguisher
- Replacement tracheal tubes, guides, and facemasks
- Rigid laryngoscopy blades or a rigid fiber optic laryngoscope
- Replacement anesthesia airway circuits
- Replacement drapes and sponges

Recommendations: The Cosmetic Surgery Safety Task Force recommends that the fire prevention
strategies described in this section be implemented in all operating facilities that use oxygen in combination with surgical procedures.

**Postanesthesia Recovery Care**

Patients may continue to be at significant risk for developing complications after an anesthesia-based procedure is completed so they may require controlled postoperative monitoring. Such conditions as decreased procedural stimulation, delayed drug absorption after nonintravenous administration, and slow drug metabolism or clearance may contribute to residual sedation and cardiorespiratory depression during this recovery period. The Cosmetic Surgery Safety Task Force strongly believes that continued appropriate perioperative observation and monitoring and use of predetermined discharge criteria decrease the likelihood of adverse outcomes for moderate sedation, deep sedation, and general anesthesia. It is the consensus of the Cosmetic Surgery Safety Task Force that discharge criteria should be designed to minimize the risk for cardiorespiratory depression after patients are released from observation by trained personnel.91,102–106

**General Principles of Postanesthesia Care**

Medical supervision of recovery and discharge after moderate sedation, deep sedation, or general anesthesia is the responsibility of the surgeon, or his or her designee, and the anesthesia staff.103–106

**Presence of a Physician**

A physician should be present until the medical discharge of the patient after clinical recovery from the surgery/procedure and anesthesia. Before medical discharge from the facility, each patient must be evaluated by a physician, or a delegated qualified professional supervised by a physician, to assess recovery. If medical discharge criteria have been previously set by the treating physician, a delegated qualified professional may determine if the patient meets such discharge criteria and, if so, may discharge the patient when those criteria are met.103,106

**Presence of Personnel Trained in Advanced Life Support**

Physicians and/or nursing personnel currently trained in advanced cardiac life support should be present until all patients operated on that day have been physically discharged.

PRESENCE OF PERSONNEL TRAINED IN BASIC LIFE SUPPORT

All clinical support personnel with direct patient contact, including nursing staff and aides, must maintain, at minimum, skills in basic cardiac life support.

**Recovery Room Standards**

The recovery area should be equipped with, or have direct access to, appropriate monitoring and emergency resuscitation equipment.106

**Monitor Patients Receiving Sedation**

Patients receiving moderate sedation, deep sedation, or general anesthesia should be monitored until appropriate discharge criteria are satisfied. The duration and frequency of monitoring should be individualized depending on the level of sedation achieved, the overall condition of the patient, and the nature of the intervention for which sedation/analgesia/anesthesia was administered. Oxygenation should be monitored until the patient is no longer at risk for respiratory depression.85,106

**Monitor Vital Signs**

Level of consciousness, vital signs, and oxygenation (when indicated) should be recorded at regular intervals.106

**Monitor for Complications**

A nurse or other professional trained to monitor patients and recognize complications should be in attendance until discharge criteria are fulfilled.104,105

**Manage Complications**

A professional who is capable of managing complications (eg, establishing a patent airway and providing positive pressure ventilation) should be immediately available until discharge criteria are fulfilled.104–106

**Recommendations:** After sedation/analgesia/anesthesia, patients should be observed in an appropriately staffed and equipped area, as described, until they are near their baseline level of consciousness and are no longer at increased risk for cardiorespiratory depression. Recorded documentation of vital signs, oxygenation, and temperature should be continued while the patient is being observed.

**Recording Monitored Parameters**

The literature lacks an evidence-based statement regarding the benefits of contemporaneous recording of
patients’ level of consciousness, respiratory function, or hemodynamics. The Cosmetic Surgery Safety Task Force agrees with the use of contemporaneous recording for moderate sedation and strongly agrees with its use for patients undergoing deep sedation and general anesthesia in concert with the ASA office-based guidelines. It is the consensus of the Cosmetic Surgery Safety Task Force that, unless technically precluded (eg, the patient is uncooperative or combative), vital signs and respiratory variables should be recorded on initiation of recovery, at regular intervals, and immediately before discharge. Maintaining a record during recovery provides documentation of attention to those factors, which if missed, could contribute to an adverse event.\textsuperscript{103–106}

Recommendations: After moderate, deep sedation, and general anesthesia, patients admitted to the post-anesthesia recovery area should have level of consciousness, ventilatory and oxygenation status, and hemodynamic variables assessed and recorded at a frequency that depends on the type and amount of medication administered, the length of the procedure, and the general condition of the patient during initial recovery and just before discharge. If recording is performed automatically, device alarms should be set to alert the care team to critical changes in patient status.\textsuperscript{106–108}

**Intravenous Access**

The members of the Cosmetic Surgery Safety Task Force strongly agree with maintaining intravenous (IV) access until patients are no longer at risk for cardiovascular or respiratory depression. In situations where sedation is initiated by non-IV (eg, oral, rectal, intramuscular), the need for IV access is not sufficiently addressed in the literature. However, initiation of IV access after the initial sedation takes effect allows additional sedative–analgesic and resuscitation drugs to be administered if necessary and for treatment of postoperative nausea and vomiting.\textsuperscript{106}

Recommendations: In patients receiving IV medications for sedation/analgesia/anesthesia, vascular access should be maintained throughout the procedure and until the patient is no longer at risk for cardiorespiratory depression. In patients who have received sedation–analgesia by non-IV routes, or whose IV line has become dislodged or blocked, practitioners should determine the advisability of establishing or reestablishing IV access on a case-by-case basis. In all instances, a professional with the skills to establish IV access should be immediately available.

**Availability of Emergency Equipment**

The Cosmetic Surgery Safety Task Force strongly agrees that the ready availability of appropriately sized emergency equipment reduces risks associated with moderate/deep sedation and general anesthesia. The literature is silent regarding the need for cardiac defibrillators during sedation/analgesia. However, as of 2010, the National Conference of State Legislatures identified 56 state bills with current or pending legislation mandating widespread availability of automated external defibrillators in schools, medical facilities, and public places.\textsuperscript{109} During moderate sedation, the panel agree that a defibrillator should be immediately available for patients with both mild (eg, hypertension) and severe (eg, ischemia, congestive failure) cardiovascular disease. During deep sedation and general anesthesia, the Cosmetic Surgery Safety Task Force agrees that a defibrillator should be immediately available for all patients.\textsuperscript{108,109} Pharmaceutical agents for nausea and pain, reversal agents, and cardiorespiratory resuscitation should be immediately available, according to accreditation agency and state requirements.

**Recommendations:** Pharmacologic antagonists and appropriately sized equipment for establishing a patent airway and providing positive pressure ventilation with supplemental oxygen should be present whenever sedation/analgesia/anesthesia is administered. Suction, advanced airway equipment, resuscitation medications, and automated external defibrillators should also be available.\textsuperscript{106,108–110}

**Emergency Equipment Available for Recovery Care**

Appropriate emergency equipment should be available whenever sedative or analgesic drugs capable of causing cardiorespiratory depression are administered. They should be in or readily available to the recovery area. The list of recommended equipment in Table 5 should be used as a guide and should be modified depending on the individual practice circumstances. Items in parentheses are recommended when children are sedated.\textsuperscript{84,94,106,108,109}

**Required Available Medications**

A complete listing of the drugs required by the various certifying agencies is not within the scope of this set of recommendations. We do recommend, however, that at a minimum the relevant accreditation and state guidelines be followed. A general list of medications that should be available is shown in Table 6. All medication should be checked regularly for expiration dates and replaced as needed.\textsuperscript{105}
Postoperative nausea and vomiting (PONV) is a complication of variable frequency after anesthesia, and although it is rarely life-threatening, it is extremely unpleasant for the patient and thus should be avoided. The literature describes many different regimens to prevent and treat PONV, depending on the type of anesthesia used.110–112

**Recommendations:** PONV medications should be readily accessible and available. A wide variety of antiemetics are available, and each facility should establish its own protocol for PONV and ensure that their preferred medications are readily available to recovery room staff, that a physician is present to direct their use, or that specific instructions are given to the nursing staff on when and what to give should a patient experience PONV.110–112

**Use of Supplemental Oxygen**

The literature supports the use of supplemental oxygen during moderate sedation and suggests that supplemental oxygen be used during deep sedation to reduce the frequency of hypoxemia.105 The Cosmetic Surgery Safety Task Force agrees that supplemental oxygen decreases patient risk during moderate sedation, while strongly agreeing with this view for deep sedation. General anesthesia requires the use of supplemental oxygen. Current guidelines also recommend the use of supplemental oxygen during patient transportation from the operating room to the recovery area.106 In addition, there is strong evidence that suggests that perioperative oxygen reduces the incidence of surgical site infection.113,114

**Recommendations:** Equipment to administer supplemental oxygen should be present or readily available in the recovery area. If hypoxemia is anticipated or

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**Table 5. Equipment Requirements for Postanesthesia Recovery Room**

- Gloves
- Tourniquets
- Alcohol wipes
- Sterile gauze pads
- Intravenous catheters (24–16 gauge)
- Intravenous tubing (pediatric micro drip, 60 drops/mL)
- Intravenous fluid
- Assorted needles for drug aspiration, intramuscular injection (intraosseous bone marrow needle)
- Appropriately sized syringes (1-mL syringes)
- Tape basic airway management equipment
- Source of compressed oxygen (tank with regulator or pipeline supply with flow meter)
- Source of suction
- Suction catheters (pediatric suction catheters)
- Yankauer-type suction
- Face masks (infant/child)
- Self-inflating breathing bag-valve set (pediatric)
- Oral and nasal airways (infant/child-sized)
- Lubricant
- Advanced airway management equipment (for practitioners with intubation skills)
- Laryngeal mask airways (pediatric)
- Laryngoscope handles (tested)
- Laryngoscope blades (pediatric)
- Endotracheal tubes
- Cuffed 6.0, 7.0, 8.0 mm in diameter (uncuffed 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0 mm in diameter)
- Stylet (appropriately sized for endotracheal tubes)106

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**Table 6. List of Medications That Should Be Available**

- Epinephrine
- Atropine
- Lidocaine
- An antihistamine
- A bronchodilator
- A vasopressor
- A corticosteroid
- An anticonvulsant
- A narcotic and benzodiazepine antagonist
- Nitroglycerin
- A vasodilator
- Intravenous glucose
- An appropriate antiarrhythmic medication
- Dantrolene (only necessary if agents used have the potential for malignant hyperthermia)
- Succinylcholine
- Antiemetic agents (intravenous, intramuscular, oral, or PR)
develops during recovery, supplemental oxygen should be administered.\textsuperscript{105,106}

\textbf{Reversal Agents}

Specific antagonist agents are available for the opioids (eg, naloxone) and benzodiazepines (eg, flumazenil). The literature supports the ability of naloxone to reverse opioid-induced sedation and respiratory depression. Practitioners are cautioned that acute reversal of opioid-induced analgesia may result in pain, hypertension, tachycardia, or pulmonary edema.\textsuperscript{115} The literature supports the ability of flumazenil to antagonize benzodiazepine-induced sedation and ventilatory depression in patients who have received benzodiazepines alone or in combination with an opioid.\textsuperscript{116} The Cosmetic Surgery Safety Task Force strongly agrees that the immediate availability of reversal agents is associated with decreased risk of adverse outcomes.\textsuperscript{106} It is the consensus of the Cosmetic Surgery Safety Task Force that respiratory depression should be initially treated with supplemental oxygen and, if necessary, positive pressure ventilation by mask.\textsuperscript{106}

\textit{Recommendations}: Specific antagonists should be available in the recovery area whenever opioid analgesics or benzodiazepines are administered for sedation/analgesia. Naloxone or flumazenil may be administered to improve spontaneous respiration efforts in patients who have received opioids or benzodiazepines, respectively. This may be especially helpful in patients in whom airway control and positive pressure ventilation are difficult. Before or concomitantly with pharmacologic reversal, patients who become hypoxic or apneic during recovery should (1) be encouraged or stimulated to breathe deeply, (2) receive supplemental oxygen, and (3) receive positive pressure ventilation if spontaneous ventilation is inadequate.\textsuperscript{106} After pharmacologic reversal, patients should be observed long enough to ensure that sedation and cardiorespiratory depression does not recur once the effect of the antagonist dissipates.\textsuperscript{85,102,105,106,116}

\textit{Accreditation Association for Ambulatory Health Care Recovery Room Standards}

In general, basic principles regarding all of the listed recommendations should also include the following practices:\textsuperscript{85-87}

- All medical supplies and pharmaceuticals should be periodically reviewed for expiration dates. Policies and procedures should be established regarding medical equipment, its standardized use, periodic testing, and scheduled preventive maintenance.
- The facility should have a written protocol in place for the safe and timely transfer of patients to a predetermined alternative care facility when extended or emergency services are needed.
- Alternate power adequate for the type of surgery performed should be available in the operative and recovery areas.

\textit{Guidelines for Discharge}

\textit{Recovery and Discharge Criteria After Sedation and Analgesia and Anesthesia}

Discharge criteria should be designed to minimize the risk of central nervous system or cardiorespiratory depression after discharge from observation by trained personnel.\textsuperscript{106,116,117} Each patient-care facility in which sedation/analgesia/anesthesia is administered should develop recovery and discharge criteria that are suitable for its specific patients and procedures. Oxygenation should be monitored periodically until patients are no longer at risk for hypoxemia. Ventilation and circulation should be monitored at regular intervals until patients are ready for discharge.\textsuperscript{105,106,108} Some of

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\hline
Variable Evaluated & Score 2 & Score 1 & Score 0 \\
\hline
Activity & Able to move all 4 extremities on command & Able to move 2 extremities on command & Able to move no extremities on command \\
Breathing & Able to breathe deeply and cough & Dyspnea & Apnea \\
Circulation systemic blood pressure & $\neq$ 20\% of the preanesthetic level & $\neq$ 20\% to 49\% of the preanesthetic level & $\neq$ 50\% of the preanesthetic level \\
Consciousness & Fully awake & Arousable & Not responding \\
Oxygen saturation pulse oxymetry & >92\% while breathing room air & Supplemental oxygen needed to maintain saturation >90\% & <90\% even with supplemental oxygen \\
\hline
\end{tabular}
\caption{Aldrete Scoring System\textsuperscript{119}}
\end{table}
the basic principles that might be incorporated in these
criteria are enumerated in this section. Patients should
be alert and oriented and vital signs should be stable
and within acceptable limits. Use of Aldrete scoring
systems (see Table 7) may assist in documenting
fitness for discharge although other systems may be
useful.117,118

Sufficient time (a maximum of 2 hours) should have
elapsed after the last administration of reversal agents
(e.g., naloxone, flumazenil) to ensure that patients do
not become re-sedated after reversal effects have worn
off.105,106,108

Outpatients should be discharged in the presence
of a responsible adult who will accompany the
patient home and be able to report any postprocedure
complications.85,105

Outpatients and their escorts should be provided
with written instructions regarding postprocedure diet,
medications, and activities, along with a phone number
to call in case of emergency. Patients need to be mon-
tored until they are near their baseline level of con-
sciousness and are no longer at increased risk for
heart or respiratory depression.

Disclaimer

These guidelines are designed to provide informa-
tion based on the available medical literature and
studies regarding the use of anesthesia in cosmetic
surgery procedures. These guidelines are not intended
to define or serve as the standard of medical care.
Standards of medical care are determined on the basis
of all facts or circumstances involved in an individual
case and are subject to change as scientific knowledge
and technology advance and as practice patterns
evolve. The guidelines present general information for
educational purposes only and are not intended nor
should they be used as a substitute for professional
medical judgment. The American Academy of Cos-
metic Surgery expressly disclaims all responsibility
and liability arising from the use of or reliance on the
guidelines and assumes no responsibility or liability
for any claims that may result directly or indirectly
from the use of the guidelines.

References


42. American Society of Anesthesiologists Task Force on Perioperative Management of Patients


Appendix A. Medical History and Physical Form

Medical History and Physical Form

Name: ________________________________________________________________
Date: __________________________________________________________________
Social: __________________________________________________________________
Sex: M __ F__ Marital status: __________________________ Occupation: ________________

Medications: list name, dose, and frequency
Prescription: __________________________________________________________

Nonprescription: ______________________________________________________
........................................................................................................................

Do you use Aspirin, Ibuprofen, Motrin, or any non-steroidal drugs? Y____ N____
If yes please list name, dose, and frequency:
........................................................................................................................
........................................................................................................................

Do you use any steroids? Y____ N____
If yes please list name, dose, and frequency:
........................................................................................................................
........................................................................................................................

Do you use any herbal supplements or vitamins? Y_____ N_____ 
If yes please list name, dose, and frequency:
........................................................................................................................
........................................................................................................................

Allergies:
Drugs: ____________________ Reaction: ________________________________
Food: ______________________ Reaction: ________________________________
Latex: ______________________ Reaction: ________________________________
Tape: ______________________ Reaction: ________________________________

Habits:
Tobacco: Y____ N____ Amount: ________/day Duration: __________
Alcohol: Y____ N____ Amount: ________/day Duration: __________
Recreational drugs: Y____ N____ Type: __________ Amount: _____/day Duration: ______
Caffeine: Y____ N____ Amount: __________/day
Daily exercise: Y____ N____ Amount: __________/day
HEALTH HISTORY
1. Have you ever been treated for heart disease? Y_____ N_____
   If yes, what disease(s): __________________________________________

2. HAVE you ever had a heart attack? Y_____ N_____
   Have you ever been told you have a heart murmur? Y_____ N_____

3. Do you have high blood pressure (hypertension)? Y_____ N_____
   If yes, do you take medication? Y_____ N_____
   What medications? _____________________________________________

4. Do you have low blood pressure? Y_____ N_____

5. Are you anemic? Y_____ N_____

6. Do you have diabetes (sugar in blood)? Y_____ N_____
   Do you take Insulin? Y_____ N_____

7. Do you have thyroid gland disease? Y_____ N_____

8. Do you have asthma? Y_____ N_____

9. Have you ever been told or do you think you have a bleeding disorder? Y_____ N_____

10. Have you ever had hepatitis, liver, or kidney disease? Y_____ N_____

11. Do you have a seizure disorder (epilepsy)? Y_____ N_____

12. Have you been in the hospital recently for a serious illness? Y_____ N_____

13. Are you pregnant? Y_____ N_____
   If yes, how many months? ______

14. Do you wear:
   Contact lenses? Y_____ N_____
   Hearing aid? Y_____ N_____
   Dental appliances? Y_____ N_____

15. Have you ever received a blood transfusion? Y_____ N_____

16. Do you have any disease that may suppress your immune system? Y_____ N_____

17. Do you have sleep apnea or snoring? Y_____ N_____

18. Do you have acid reflux? Y_____ N_____

19. Do you asthma or any respiratory disease? Y_____ N_____

20. Do you have any weight changes in the past 12 months? Y_____ N_____
   If yes, describe: _____________________________________________

21. Have you ever had any serious illness? Y_____ N_____
   If yes, describe: _____________________________________________

22. Do you have or have you ever had any communicable disease? Y_____ N_____
   If yes, describe: _____________________________________________

23. Do you have hepatitis? Y_____ N_____
   If yes, what type? _____________________________________________
   Did you receive any treatment?

24. Have you ever been tested for HIV? Y_____ N_____
   If yes what year?
   Test result: Positive____ Negative_____
Surgical History:
Procedures:                      Year:                      Anesthesia:

________________________________________________________________________
________________________________________________________________________

Any history of complications or bad result?
________________________________________________________________________
________________________________________________________________________

Anesthesia History: list any history of anesthesia, complications, or reactions
Local: Y ___ N __________
Complications/reactions: ________
General: Y ___ N __________
Complications/reactions: ________
Spinal/Epidural: Y ___ N __________
Complications/reactions: ________

Family History:
Abnormal Bleeding: Y ___ N __________
Cancer: Y ___ N __________
Heart Disease: Y ___ N __________
Diabetes: Y ___ N __________
Anesthetic Problems: Y ___ N __________
Kidney Disease: Y ___ N __________
Liver Disease: Y ___ N __________
Serious Illness: Y ___ N __________

Are you currently under the care of a physician? Y ___ N __________
If yes, explain:
Name of Primary-care physician: ____________________________
Phone: __________________________
Address: __________________________

Women patients only:
Number of pregnancies: __________
Number of Children: __________
Did you breast feed? Y ___ N __________
If yes, for how long? __________________________
Last menstrual period: __________________________

Review of Systems: to be completed by Physician
Chest pain: Y ___ N __________
Abnormal Heart Beat: Y ___ N __________
Stroke: Y ___ N __________
Seizure: Y ___ N __________
Fainting spell: Y ___ N __________
Obesity: Y ___ N __________
Difficulty voiding: Y N
Current Pregnancy: Y N
Vomiting: Y N
Cough: Y N
Recent respiratory infection: Y N
Shortness of Breath: Y N
Short Neck: Y N
Neck Mobility: Y N
Mouth opening more than two fingers: Y N
Loose dental devices: Y N
Comments: 


Physical Exam:
Height: Weight: BMI:
BP: P: T:
HEENT:
CVS:
Pulmonary:
ABDOMEN:
Extermities:
Neurologic:
Other:

Laboratory: (If applicable)
H/H: PT/PTT/INR:
WBC:
K+ Na+ BUN
Cr Ca++
CL
Glucose HBA1C
HCG: Urine Blood
Mammogram
EKG (over 40 or if indicated)
CXR (if indicated)
Comments:


ASA (American Society of Anesthesiologists) classification:
ASA I ( ) Normal Healthy patient
ASA II ( ) Patient with mild systemic disease or smoker
ASAIII ( ) Patient with severe systemic disease
ASA IV ( ) Patient with severe systemic disease that is a constant threat to life

Facility selected for surgery:
Office ( ) Outpatient surgical facility ( ) Hospital ( )
Appendix B. Definitions of Different Levels of Anesthesia

Local or topical anesthesia: The application of local anesthetic agents in appropriate doses adjusted for weight.

Minimal sedation (anxiolysis): A drug-induced state during which patients respond normally to verbal commands. Although cognitive function and coordination may be impaired, ventilator and cardiovascular functions are unaffected. Inhaled nitrous oxide in low concentrations that would not reasonably be expected to result in loss of the patient’s life-preserving protective reflexes is an example of minimal sedation.

Moderate sedation/analgesia (conscious sedation): A drug-induced depression of consciousness during which patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation. No interventions are required to maintain a patient airway, and spontaneous ventilation is adequate. Cardiovascular function is usually maintained.

Deep sedation/analgesia: A drug-induced depression of consciousness during which patients cannot be easily aroused but respond purposefully after repeated or painful stimulation. The ability to independently maintain ventilator function may be impaired. Patients may require assistance in maintaining a patent airway, and spontaneous ventilation may be inadequate. Cardiovascular function is usually maintained.

General anesthesia: A drug-induced loss of consciousness during which patients are not able to be aroused, even by painful stimulation. The ability to independently maintain ventilator function is often impaired. Patients often require assistance in maintaining a patent airway, and positive pressure ventilation may be required because of depressed spontaneous ventilation or drug-induced depression of neuromuscular function. Cardiovascular function may be impaired.

Note: Because sedation is a continuum, it is not always possible to predict how an individual patient will respond. Those administering minimal or moderate sedation/analgesia or regional anesthesia should be able to support the respiratory and cardiovascular system of patients who enter a state of deep sedation/analgesia, and those administering deep sedation/analgesia should be able to support the respiratory and cardiovascular system of patients who enter a state of general anesthesia.

Appendix C. Information Provided and Recorded During Administration of Anesthesia;
Sample Anesthesia Record

1. Patient name, date of birth, and date of procedure
2. Procedure, diagnosis, and surgeon
3. Anesthesia provider name and signature
4. Allergies, including sensitivities to latex, egg, and soy
5. Documentation of all equipment and monitors used:
   A. Monitors: Electrocardiogram, noninvasive blood, \( Sa_o_2 \) (oxygen saturation), \( O_2 \) analyzer, and capnometer (end tidal \( CO_2 \))
      i. Stethoscope (precardial or esophageal)
      ii. Temperature (esophageal, rectal, or skin)
   B. Equipment: humidifier, warming blanket, fluid warmer, ventilator, monitor alarms, suction, laryngoscope, and anesthesia circuit
6. Anesthetic agents used
7. Anesthesia airway classification (Mallampati score; see Appendix E)
8. American Society of Anesthesiologist Class status (see Appendix F)
9. Anesthetic technique: general, monitored anesthesia care (MAC), total intravenous anesthesia (TIVA), blocks (Note: The TIVA terminology is preferred to MAC)
10. Airway management equipment used
    A. Intubation (oral, nasal, tracheal): include endotracheal tube size, if cuffed; if stylet is used, monitor how bilateral breath sounds are heard and how tube is secured
    B. Airways used (oral, nasal, laryngeal mask airway)
11. Airway induction method
    A. Intravenous (IV) routine
    B. IV rapid sequence
    C. Inhalation
    D. TIVA
    E. Regional
    F. Mask (easy, adequate, or difficult)
12. Patient position (written or drawn; height and weight)
13. Eye protection (use of tape, goggles, or Lacri-Lube [Allergan, Irvine, Calif])
14. IV site, gauge, and fluids administered
15. Anesthesia start and stop times; surgery start and stop times
16. Monitoring: initial vital signs obtained and recorded before induction
A. Blood pressure and pulse measured at 5-minute intervals
B. Respiration rate, electrocardiogram, O₂ saturation, Fio₂ (forced inspiratory oxygen percentage), and end tidal CO₂ measured at 15-minute intervals
C. Temperature monitoring required for Medicare patients at 15-minute intervals

17. IV fluids used with final amounts, urine output, estimated blood loss

18. Patient condition upon transfer to recovery with vital signs and level of awareness/arousal

19. Postanesthesia assessment
   A. Vital signs taken every 5 minutes for 15 minutes then every 15 minutes until discharge
   B. Pain status
   C. Operative site (incision, dressing status)
   D. Intake and output: include IV site, fluids, and time IV administration discontinued; document Foley or void
   E. Modified Aldretti Scale for movement, breathing, blood pressure, arousal status, and color
   F. Discharge status
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**ANESTHESIA RECORD**

WHITE - Chart  YELLOW - Anesthesia Office
Appendix D. Recommended Monitoring for the Levels of Anesthesia

- Local or topical anesthesia
  - Qualified provider and support team
  - Supplemental oxygen, positive pressure ventilation (Ambu bag), suction
  - Pulse oximeter (SpO₂)/pulse continuous monitoring
  - Blepharoplasty (electrocardiac monitoring)

- Regional anesthesia
  - Qualified provider and support team
  - Supplemental oxygen, positive pressure ventilation (Ambu bag), suction
  - Pulse oximeter (SpO₂)/pulse continuous monitoring

- Minimal sedation (anxiolysis)
  - Qualified provider and support team
  - Supplemental oxygen, positive pressure ventilation (Ambu bag), suction
  - Pulse oximeter (SpO₂)/pulse continuous monitoring

- Moderate sedation/analgesia (conscious sedation)
  - Qualified provider and support team
  - Supplemental oxygen, positive pressure ventilation (Ambu bag), suction
  - Sequential compression devices/TED hose (consideration for procedures >1 hour)
  - Pulse oximeter (SpO₂) continuous monitoring
  - Noninvasive automated blood pressure monitoring (NIABP)
  - Electrocardiogram (ECG) continuous monitoring
  - Warming blanket (optional)

- Deep sedation/analgesia
  - Qualified provider and support team
  - Supplemental oxygen, positive pressure ventilation (Ambu bag), suction
  - Sequential compression devices/TED hose
  - Pulse oximeter (SpO₂) continuous monitoring
  - NIABP
  - ECG continuous monitoring
  - Bladder catheter (4 hours or greater)
  - Exhaled CO₂ (strongly recommended)
  - Warming blanket (optional)

- General inhalational anesthesia
  - Qualified provider and support team
  - Supplemental oxygen, positive pressure ventilation (Ambu bag), suction
  - Sequential compression devices/TED hose
  - Pulse oximeter (SpO₂) continuous monitoring
  - NIABP
  - ECG continuous monitoring
  - Bladder catheter (4 hours or greater)
  - End-tidal CO₂ monitoring
  - Body temperature monitoring
  - Warming blanket

Supervision Authority
- Physician: credentialed and qualified by the appropriate agencies

Anesthesia Providers
- Credentialed qualified provider/clinical privileges:
  - Anesthesiologist, qualified certified registered nurse anesthetist, or qualified health care professional
  - Note: The anesthesiologist or nurse anesthetist performing the anesthesia should have required credentialing and certification to perform the anesthetic required for the procedure. In addition, he or she should have the privileges to perform the different anesthetic techniques required at the outpatient facility or the hospital.

Appendix E. Mallampati Test

The Mallampati classification correlates tongue size to pharyngeal size. This test is performed with the patient in the sitting position, head in a neutral position, the mouth wide open, and the tongue protruding to its maximum. Patient should not be actively encouraged to phonate as it can result in contraction and elevation of the soft palate leading to a spurious picture.

Classification is assigned according to the extent to which the base of the tongue is able to mask the visibility of pharyngeal structures into three classes:

- **Class I:** Visualization of the soft palate, fauces, uvula, and anterior and posterior pillars
- **Class II:** Visualization of the soft palate, fauces, and uvula
- **Class III:** Visualization of the soft palate and base of the uvula

In Samsoon and Young’s modification (1987) of the Mallampati classification, a IV class was added.

- **Class IV:** Only the hard palate is visible; the soft palate is not visible at all

To avoid false-positive or false-negative results, this test should be repeated twice. As it is not possible to measure the size of the posterior part of the tongue relative to the capacity of the oropharynx, this method of assessment gives an indirect means of evaluating their relative proportionality. If the base of the tongue is proportional to the oropharynx, then provided there are no other disturbing factors, the exposure of the glottic inlet will not be difficult. On the other hand, a disproportionately large base of the tongue will...
overshadow the larynx and perhaps make the angle between the 2 more acute, preventing easy exposure of the larynx.

Appendix F. American Society of Anesthesiologist (ASA) Physical Status Classification System

ASA I: Patients are considered to be clinically normal and healthy. Patients are able to walk up a flight of stairs or 2 level city blocks without distress. There is little or no anxiety and little or no risk. This classification represents a green flag for treatment.

ASA II: Patients have mild to moderate systemic disease or are healthy patients with ASA I classification who demonstrate a more extreme anxiety and fear about surgery. Patients are able to walk up a flight of stairs or 2 level city blocks, but will have to stop after completing the exercise because of distress. There is minimal risk during treatment. This classification represents a yellow flag for treatment.

Examples: Patients with a history of well-controlled disease states including type 2 diabetes, pre-hypertension, epilepsy, asthma, or thyroid conditions; patients with an ASA I classification who have a respiratory condition, are pregnant, and/or have active allergies. This type of patient may need medical consultation.

ASA III: Patients have severe systemic disease that limits activity but is not incapacitating. Patients are able to walk up a flight of stairs or 2 level city blocks, but will have to stop en route because of distress. This classification represents a yellow flag for treatment.

Examples: Patients with a history of angina pectoris, myocardial infarction, or cerebrovascular accident within the previous 6 months; severe congestive heart failure; moderate to severe chronic obstructive pulmonary disease; and uncontrolled diabetes, hypertension, epilepsy, or thyroid condition. If emergency treatment is needed, medical consultation is indicated.

ASA V: Patients are moribund and are not expected to survive more than 24 hours with or without surgery. These patients are almost always hospitalized, terminally ill patients. Elective surgical treatment is definitely contraindicated; however, emergency care, in the realm of palliative treatment, may be necessary. This classification represents a red flag for surgical care, and any care is done in a hospital situation.

ASA VI: Clinically dead patients being maintained for harvesting of organs.

ASA-E: Indicates an emergency operation of any variety (used to modify one of the other classifications, that is, ASA III-E).

Appendix G. World Health Organization Guidelines for Patient Safety in an Operating Room

1. Sign in (before inducing anesthesia)
   A. Patient has confirmed identity, site, and procedure consent
   B. Site marked/not applicable
   C. Anesthesia safety check completed
   D. Pulse oximeter on patient and functioning
   E. Does patient have a known allergy?
   F. Difficult airway/aspiration risk? If yes, is equipment/assistance available?
   G. Risk of blood loss? If yes, are adequate intravenous access/fluids planned?

2. Time out (before skin incision)
   A. Confirm that all team members have introduced themselves by name and role; surgeon, anesthesia professional, and nurse verbally confirm the following:
      i. Patient
      ii. Site
      iii. Procedure
   B. The surgeon reviews anticipated critical events:
      i. What are the critical or unexpected steps, operative duration, and anticipated blood loss?
C. Anesthesia team reviews if there are any patient-specific conditions
D. Nursing team reviews if sterility (including indicator results) has been confirmed and if there are any equipment issues or concerns
E. Has antibiotic prophylaxis been given within the last 60 minutes?
   i. Yes, when applicable
F. Is essential imaging displayed?
   i. Yes, when applicable

3. Sign out (before the patient leaves the operating room)

A. Nurse verbally confirms the following with the team:
   i. The name of the procedure
   ii. Preoperative/postoperative diagnosis recorded
   iii. Instrument, sponge, and needle counts are correct (or not applicable)
   iv. How the specimen is labeled
   v. Whether there are any equipment problems to be addressed

B. Surgeon, anesthesia professional, and nurse review the key concerns for recovery and management of the patient