ELSEVIER

Ambulatory Surgery 5 (1997) 29–36

Ambulatory Surgery

Highlights from the 1996 American Society of Anesthesiologists' Annual Meeting Panel on: Admission and Discharge Criteria: "Why you can't get in... why you can't go home!"

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Keywords: Preoperative management; Guideline development; Surgicenters; Discharge criteria

1. Introduction

A leading group of experts in preoperative evaluation and ambulatory anesthesia convened a panel at the October 1996 American Society of Anesthesiologists' Annual Meeting. This panel focused on the recent issues related to criteria for ambulatory admission and discharge. Speakers addressing these issues included Rebecca S. Twersky MD, the panel moderator, Reuven Pasternak MD, Bradly Narr MD, Stephen Fischer MD, and Patricia Kapur MD.

The issues related to preoperative evaluation are that there has been no consistent system for risk assessment to determine appropriate preoperative management. The costs of preoperative laboratory testing are estimated to be between $20–$30 billion per year in the US. Health care cost containment in the US has moved surgery into the out-patient and same day admission settings in about 80–85% of all elective surgeries. The selection of procedures by third party payers to be done on an out-patient and same day admission basis is generally determined on the presumed complexity of the procedure and not the patient's other underlying medical problems or potential issues associated with anesthesia. Therefore, preoperative assessment and postoperative management provides challenges for the anesthesiologist from both a clinical and an organizational perspective.

2. Guideline development

Dr. Reuven Pasternak, Associate Professor of Anesthesiology and Critical Care Medicine at the Johns Hopkins School of Medicine, and Chair of the American Society of Anesthesiologists (ASA) Task Force on Pre-Anesthesia Guidelines enlightened the audience with the project of guideline development. The objective of the preanesthesia guideline is to develop an approach to preanesthesia evaluation and testing that is sound and accepted not only within the specialty but whose recommendations are acknowledged by primary care physicians and surgeons. The force behind guideline development has been the changing structure of medicine, with the need to establish accountability and cost-effective choices. These choices should show that there is added value to a particular test or evaluation, and the benefits exceed the costs for all parties. Value, however, is subjective and depends on the vantage point and how quality is perceived. The fundamental questions attempted to be answered in the pre-anesthesia guidelines are: 'when and by whom should patients be evaluated preoperatively and what tests should be conducted?' The anesthesiologist, as the perioperative physician, must be in charge of the process of preanesthesia evaluation, although for years this process was 'given away' to our internal medicine colleagues. The preanesthesia guideline would serve as an advisory framework for practice, while still preserving the clinician's ability to use discretion. The evidence-based guidelines should show that there is an association between the decision and the outcome. For preanesthesia evaluation the decisions made should show a reduc-

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PII S0966-6532(97)00136-4

tion in anesthesia-related complications, morbidity and mortality, unplanned admissions, while improving utilization of service by reducing delays and cancellations. However, despite a review of nearly 2000 articles, there did not appear to be direct linkages between the intervention taken (e.g. specific lab tests, timing of preoperative evaluation) and a reduction in clinical, physiologic or system morbidities. Therefore, an alternative approach needed to be taken, and is still underway by the ASA.

These guidelines will be based on a consensus model developed by experts and consultants. The framework will take into account the preoperative medical status, using the ASA classification system, the surgical risk classification based on the nature of the procedure (Table 1) and the type of anesthesia to be administered. The current philosophy is that preanesthesia evaluation is a focused assessment to address issues relevant to the safe administration of anesthesia and performance of surgery. The preanesthesia evaluation is a component of the overall surgical evaluation and should be performed under the direction and guidance of anesthesiologists. Performance by other medical personnel does not constitute a preanesthesia evaluation. This evaluation is related to the primary care process, but should not serve as a general physical screening. When acute or chronic medical conditions are encountered during the preanesthesia assessment that require further evaluation or treatment, the patient should be referred to his/her primary care provider or organization. Requests

Table 1
Surgical classification system

Category 1	Minimal risk to the patient independent of anesthesia Minimally invasive procedures with little or no blood loss Often done in an office setting with the operating room used principally for anesthesia and monitoring
Category 2	Minimal to moderately invasive procedure Blood loss less than 500 cc Mild risks to patient independent of anesthesia
Category 3	Moderately to significantly invasive procedure Blood loss potential 500–1500 cc Moderate risk to patient independent of anesthesia
Category 4	Highly invasive procedure Blood loss greater than 1500 cc Major risk to patient independent of anesthesia
Category 5	Highly invasive procedure Blood loss greater than 1500 cc Critical risk to patient independent of anesthesia Usual postoperative ICU stay with invasive monitoring

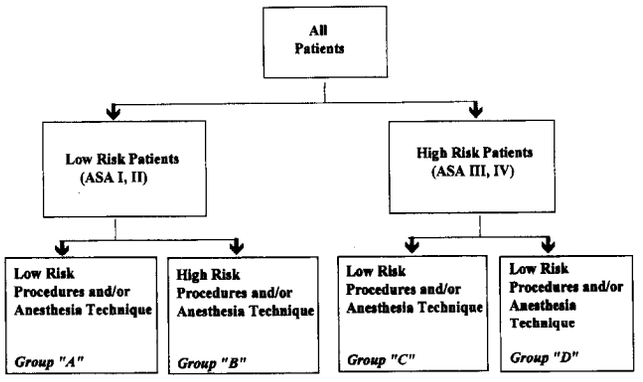

Fig. 1. Preoperative algorithm.

by patients for performance of tests not deemed necessary for the performance of surgery or administration of anesthesia should be referred to other primary health care sources. Tests, consultations and preoperative therapy are obtained on the basis of a reasonable expectation of their utility to the anesthesia and the surgical staff during the perioperative and postoperative periods. Dr. Pasternak presented his decision tree for preoperative evaluation (Fig. 1). There are clear indications in which healthy, low risk patients, scheduled for low risk procedures and anesthesia may not have added benefit from being evaluated by the anesthesiologist prior to the day of surgery. Conversely, there are medically complex patients who are undergoing complex surgery and/or anesthesia who must be seen by the anesthesiologists in a preoperative evaluation center or clinic. The grey zone exists for those patients that are low risk but undergoing high risk procedures, or those high risk patients undergoing low risk procedures. The pros and cons of a preanesthesia evaluation center and the utility of ordering tests were addressed later on in the panel. The ASA consensus model should be completed in 1997.

3. Preoperative tests

To address the recurring questions that arise in daily practice regarding the appropriateness of specific preoperative tests, the panel featured Dr. Bradly Narr, Assistant Professor of Anesthesiology, and Chair, Division of Intensive Care and Respiratory Therapy from the Department of Anesthesia and Critical Care at the Mayo Clinic. He provided various references that support the notion that preoperative laboratory testing may indeed have become obsolete.

Preoperative laboratory tests should only be performed because they will influence medical treatment. There are no perfect tests, as the specificity and sensitivity of the laboratory test varies, resulting in false positives and negatives. In the 1970s, preoperative screening

tests were conducted because they were believed to detect disease, just based on screening alone. However, that notion has been disproved. It is difficult to improve an individual's condition if the person is asymptomatic. It is traditionally thought that history is an important trigger for laboratory tests. In a study by Kim and Berlowitz [1], extensive lab tests were conducted on severely impaired nursing home residents, who could not provide an accurate history. They demonstrated that the use of routine comprehensive laboratory panels to assess severely impaired patients in a long-term care facility may be of limited value. None of the screening panels detected an abnormality that led to patient benefit, compared with 1%, 1.4% and 3% of monitoring, follow-up and diagnostic panels, respectively. Despite the restricted population in a group presumably more likely to have new abnormalities requiring intervention, the impact remained minimal. It is unlikely that a healthier population, like that scheduled for ambulatory surgery, would have a greater yield of laboratory abnormalities. Based on this study, there is no support for the use of a comprehensive battery of screening laboratory tests. An alternative to the automatic, routine practice of ordering a large number of lab tests would be to eliminate all of the tests that are used for true screening purposes. Lab tests can be limited primarily to diagnostic purposes, or when a patient's clinical status changes acutely. Monitoring and follow-up tests strictly defined and tailored to individual patient needs may also be useful.

The value of coagulation studies was discussed. There are many false positives secondary to viral infections that can induce an elevated PTT. Abnormal tests do not predict intraoperative or postoperative bleeding. Rather, history and surgical technique are stronger predictors of perioperative bleeding. In the largest prospective study of preoperative coagulation testing and its effect on outcome, Houry et al. [2], reported that there was no relation between the results of the screening tests and postoperative hemorrhage related to mortality. The patients were divided into four groups: normal history and normal tests; normal history and 1 or more abnormal tests; abnormal history and normal tests; and abnormal history and abnormal tests. Postoperatively, all groups had similar incidence of hematomas, blood loss from drains, reoperations from hemorrhage and mortality due to bleeding. More patients within the abnormal preoperative coagulation test groups had more operations postponed and more additional tests ordered, $P < 0.001$. More patients in the abnormal history and lab group required blood transfusions and modifications of anesthetic and surgical vigilance. However, the difference in median amounts of blood transfused was only 1 unit. There were no intergroup differences in postoperative hemorrhage-related mortality. Routine preoperative coagulation testing is not warranted in patients with normal clinical data who are undergoing surgical procedures. These investigators concluded that detection of coagulation test abnormalities are of no use outside the setting of clinical or history abnormalities with the common knowledge that bleeding is related to surgical techniques [2]. Therefore, recommendations for coagulation tests are in those patients who are on anticoagulation treatment, have liver disease, or history of bleeding disorder, ongoing transfusions or significant nutritional deficiencies.

The appropriate age for conducting a preoperative ECG is based on the incidence and prognosis of unrecognized MI. As unrecognized myocardial infarctions are as likely as recognized ones to cause death, heart failure or stroke, identifying this in the perioperative period may affect the anesthetic and surgical plan. Data suggest that this incidence is increased in males >45 and females >55 years of age, in the absence of any other clear risk factors [3]. The Framingham Study estimates that 25% of infarctions in males and 40% of infarctions in females are unrecognized and appear on biennial ECGs [3]. The incidence of new abnormalities with repeat ECGs for time periods was reviewed by Rabkin and Home [4,5] and they concluded that in patients greater than age 60 the incidence of new abnormalities is high enough (20% compared to 10% in patients less than 60) to justify retesting, especially if the previous ECG was abnormal. Interestingly, however, the new abnormalities could not be seen to have any effect on clinical decisions in the perioperative period [5]. The reasons to obtain a preoperative ECG are to identify risk, help quantify abnormalities, and decide about perioperative treatment.

Recommendations for laboratory testing as required for administration of anesthesia are offered in Table 2.

4. Organizing preoperative evaluation and patient education

To streamline the system for preoperative evaluation and laboratory testing, Dr. Stephen Fischer, Assistant Professor of Anesthesiology and Medical Director of the Anesthesia Preoperative Evaluation Program at the Department of Anesthesiology Stanford University School of Medicine, discussed the organization of a preoperative evaluation and patient education program. Because of the rapidly changing health care environment, a preanesthesia clinic establishes control, accountability and responsibility for the anesthesiologist. 'Visibility by the anesthesiologists is viability!' Several components are needed to operate a successful preoperative evaluation program/clinic (PAEC): staffing, financial commitment by the institution, and the involvement of the anesthesiologists as the periopera-

tive medical specialists. Until recently, many facilities have had very informal systems for preanesthesia clinics with a non-dedicated area and staff, with limited hours of operation. However with the changes in health care reimbursement and the increase in volume and acuity of out-patients and same day admission, a well-run, efficient PAEC may reap significant benefits for the patient, physicians and ambulatory surgical facilities.

Inadequate facilities and equipment, limited availability of anesthesia residents, lack of attending oversight, unavailability of old medical records, and absence of a surgical history or physical exam at the time of the anesthesia pre-op led to incomplete patient work-ups. In addition, the lack of on-site phlebotomy or technical assistant, overcrowded and uncomfortable waiting room with long patient waits of up to 2–3 h resulted in patients leaving without being evaluated and receiving adequate patient teaching. This resulted in significantly high day-of-surgery cancellations or delays, excessive preoperative lab testing, and inappropriate consultations, all of which add to the cost of health care. Dr. Fischer indicated that the greatest value for establishing a pre-anesthesia evaluation center lies in its ability to decrease cost by: providing efficient service, with appropriate utilization of preoperative lab testing and consultations; greatly enhancing clinical productivity by reducing cancellations and delays; and preserving physician and patient satisfaction with timely access for the patient.

Table 2
Recommended laboratory testing (these tests are required for administration of anesthesia and are not intended to limit those required by surgeons for issues specific to their surgical management)

Electrocardiogram	Age 50 or older
	Hypertension
	Current or past significant cardiac disease
	Current or past circulatory disease
	Diabetes mellitus (age 40 or older)
	Renal, thyroid or other metabolic disease
	Procedure level 5
Chest X-ray	Asthma or COPD that is debilitating or with change of symptoms or acute episode within past 6 months
	Cardiothoracic procedure
	Procedure level 5
Serum chemistry	Renal disease
	Adrenal or thyroid disorders
	Diuretic therapy
	Chemotherapy procedure level 5
Urinalysis	Diabetes mellitus
	Renal disease
	Genito-urologic procedure
	Recent genitourinary infection
	Metabolic disorder involving renal function
	Procedure level 5
Complete blood count	Hematological disorder
	Vascular procedure
	Chemotherapy
	Procedure level 4
Coagulation studies	Anticoagulation therapy
	Vascular procedure
	Procedure level 5
Pregnancy testing	Patients for whom pregnancy might complicate the surgery
	Patients of uncertain status by history and/or examination

There is a need to develop protocols/clinical pathways, and integrate the process of preoperative assessment into QA review, so that the value of a PAEC can be directly measured. A preanesthesia clinic can also greatly enhance the preoperative education of patients and families. The facility can include a preoperative teaching area, where the patients are able to review video tapes from a patient education library, reinforce preoperative instructions, and review special concerns. The clinical nurse educator is an integral part of the preanesthesia clinic and is responsible for engaging the patients and their families in preoperative education. This interaction can decrease anxiety and fear, and increase awareness and patient comfort. The clinic also provides an educational experience for the residents, medical students and perioperative staff. There also exists an opportunity for clinical research. The staffing of a PAEC should include an on-site anesthesia director, with either dedicated anesthesia residents or utilization of nurse practitioners. The anesthesiologist is available to provide an anesthesia/medical consultation for the medically-complex patients. Implementation of these strategies requires the commitment of the Anesthesiology Department chair, faculty collaboration, and an alliance with the Department of Nursing. Dr. Fischer described the initial reluctance within the surgical specialties to send the patients to the clinic. Now, because the Department of Anesthesia offers almost a 'guarantee' to proceed with surgery, sending the patient to the PAEC has a clinical advantage.

A financial plan needs to be made involving nursing, anesthesia, and administration. The economics of a preoperative screening clinic can only be fully appreciated if there is available resource utilization data. Facilities will experience a decrease in lab and diagnostic studies, a reduction in the number of surgery cancellations and delays, decreases in overall cancellations and unnecessary medical consultations [6,7]. These all translate into significant cost savings. In a recent article, Dr. Fisher reported that in his facility, cancellations decreased from 132 to 16, or 1.7% to 0.2%, respectively [6]. By reviewing pre-op lab selection, medically unnec-

essary lab tests will be cancelled unless the surgical specialty attending has specific preoperative requirements. By enforcing accountability in lab testing, $112 per patient could be saved by eliminating unnecessary lab tests, extrapolated to $1 million in cost savings per year [6]. These cost savings can easily demonstrate to the hospital administration the benefit of a PAEC.

5. Freestanding ambulatory surgical facilities

Dr. Patricia Kapur, professor and chairman of the Department of Anesthesiology at the University of California Los Angeles School of Medicine, and the Medical Director of the UCLA Surgicenter, provided insight into the clinical challenges facing the practitioner in the freestanding ambulatory surgical facility. Certain assumptions exist in surgicenters: that the patients are as well prepared for surgery as possible; that the anesthesiologist providing care in this setting is capable of caring for all patient types; and that the center is able to stabilize a patient prior to transferring the patient to a hospital. A surgicenter does not have a blood bank, comprehensive pharmacy, respiratory therapy services, an extensive laboratory or advanced radiological services. As such, surgical case selection is limited; as are the types of patients that can be managed in a freestanding facility. Although freestanding facilities have expanded their case load beyond the ASA 1 and 2 patients, the clinician needs to assess the likelihood of medical complications, and the need for invasive monitoring, if it becomes necessary during the perioperative course. Therefore, preoperative screening becomes an essential component of patient preparation in a surgicenter. An ASA 3 or 4 patient may be operated on in a freestanding surgicenter, given that the patient is stable, and the chronic condition is well managed. The planned anesthetic technique should not worsen the patient's chronic medical condition or result in prolonged postoperative observation or sequelae. The perioperative period should not be the time to adjust the medical management of the patient with pre-existing disease. Examples of various disease states were given.

5.1. The cardiac patient

The patient with stable hypertension, coronary artery disease, compensated valvular abnormalities, stable post-cardiac surgery patients, may be appropriate for the freestanding surgicenter. Each facility must recognize its abilities in being able to treat a patient with cardiac complications, new or breakthrough arrhythmias, hypertension, ischemia, hypotension, congestive heart failure or cardiac arrest. These conditions may require a diversion of resources for patient treatment and facilities should be staffed accordingly. General principles for managing the cardiac patient are to continue preoperative medications and to understand the anesthetic and cardiac drug interactions. In addition, for a surgicenter to undertake elective surgery on a cardiac patient, it must determine whether the facility can perform a 12 lead EKG, test for a simple panel of electrolytes, have external pacing capability and whether the staff is Advanced Cardiac Life Support (ACLS) certified.

5.2. The patient with bronchospastic disease

It is quite common to anesthetize a patient with bronchospastic disease in a freestanding surgery. This has become particularly common in patients undergoing endoscopic sinus surgery. These patients should be thoroughly evaluated for the severity of the disease, exacerbating factors and predictability of asthma attacks and degree of symptom control. Patients may have been treated with steroid and $\beta 2$ agonist inhaler therapy, which would be continued as appropriate immediately prior to surgery and prior to discharge. Dr. Kapur suggested that those practising in surgicenters may prefer to use the laryngeal mask airway instead of instrumenting the larynx. Should bronchospasm occur, the facility should have the capability of treating the patient with beta agonists, theophylline, or if not resolved, transfer the patient to the hospital.

Patients with a recent URI, prolonged intubation, or prior intubation difficulties may be prone to postoperative croup. If croup does occur, the freestanding surgicenter must be prepared to treat it, provide aerosolized dexamethasone, or transfer the patient to a hospital if symptoms are not resolved.

5.3. Diabetics

Patients on oral hypoglycemic, and stable intermittent insulin, implantable insulin pumps, and those with no serious cardiovascular compromises can be safely managed in a freestanding surgicenter. The patients must be observed postoperatively for no prolonged nausea and vomiting. Perioperative considerations are the same for hospital-based ambulatory surgery units.

5.4. Renal failure

A patient with history of renal failure should have current lab data available for review preoperatively and must be evaluated as to his/her volume status. The patient should not be scheduled for a procedure that is expected to result in significant fluid shifts. The blood pressure must be controlled, as well as other associated cardiac symptoms. Patients that are post liver or renal transplant may be managed in a freestanding surgicenter, provided that their conditions are stable.

5.5. Obesity

Unlike the hospital setting, the surgicenter may set limits on patient weight, due to limitations of the standard available equipment. The patient should be able to lie supine, have no obstructive sleep apnea and should be scheduled for short procedures.

5.6. Extremes of age

Preemies >52 weeks postconceptual age, with no history of apnea of bradycardia can be managed as out-patients in a freestanding surgicenter. The full-term infant, >44 weeks, with no significant history, would not require any special neonatal facility. The elderly, if they meet other organ system criteria, and the home support situation is good, may be appropriately managed through a freestanding surgicenter. The facility should determine this prior to patient's arrival on the day of surgery.

5.7. Communicable diseases

A freestanding surgicenter can manage a patient with Hepatitis B or HIV, as universal precautions are essentially applied to all patients. Patients with respiratory infections, such as tuberculosis, should be managed in an isolation facility postoperatively. Patients undergoing out-patient surgery following a transplant, should have no evidence of rejection, and may be immunosuppressed. They should have their immunosuppression regimen maintained, including cyclosporin elixir. Malignant hyperthermia-susceptible patients may be managed in a freestanding facility, as long as the patient receives a trigger free anesthesia, and that a treatment plan is ready. Dantrolene must be available; at least for 3 mg/kg dose for a 100 kg person.

5.8. Extended observation

Freestanding surgicenters may be able to perform procedures that heretofore have been considered too extensive for an out-patient facility: e.g. laparoscopic cholecystectomies, laparoscopic vaginal hysterectomies, anterior cruciate ligament repairs, ORIF of distal extremities, rhytidectomies, mastectomies, non-invasive neurosurgical procedure following MRI, radiofrequency ablation for Parkinson's disease. These are possible with extended observation units contiguous with the surgicenters that permit 24–72 h of non-acute patient care. There is significant regional variation within the United States regarding licensure, accreditation, and reimbursement of these facilities.

5.9. Inappropriate patients for surgicenters

Nonetheless, there are still patients whose medical conditions are significantly brittle, and who may best be managed within a hospital setting. These include patients with severe pulmonary dysfunction, marginal myocardial reserve, severe coronary artery disease, brittle diabetes, unusually challenging airway, CPAP-dependent sleep apnea, mentally challenged with behavioral disruption. The clinician must evaluate and decide whether elective surgery is appropriate under any circumstance, regardless of the location in which it is being performed.

6. Criteria for discharge and their impact on outcome

The concluding lecture, presented by Dr. Rebecca Twersky, Associate Professor of Anesthesiology at SUNY Health Science Center at Brooklyn and Medical Director of the Ambulatory Surgery Unit, discussed the criteria for discharge and how they impact on outcome. Outcome following ambulatory surgery can be measured by: unanticipated hospital transfer or admissions, readmissions following discharge, frequency of minor side effects on patients follow-up, resumption of patient's activity of daily living, and patient satisfaction. Do criteria for discharge influence any of these outcome variables? Dr. Twersky first addressed how long a patient must remain in the ambulatory surgery unit following surgery. Time is not as crucial as is the need for fulfilling criteria that reflect the passages of the patient through the phases of early and intermediate recovery. While in the past a fixed-time interval had been suggested for recovery, it is now felt that criteria-based rather than time-based recovery better determines when the patient can be transferred to the step-down area and discharged home. There is no evidence that improved outcome occurs when patients are discharged following fixed time intervals.

The recovery phase of the ambulatory patient has been divided into early, intermediate and late stages. The first two stages occur while the patient is physically present in the Ambulatory Surgery Unit (ASU). Phase 1 where the patient remains in the recumbent position, and Phase 2 where the patient will ambulate and prepare for discharge from the facility. Phase 1 recovery incorporates the period of observation in a monitored unit upon transfer from the O.R. Skilled nursing staff conduct regular assessment of the patient's cardiorespiratory status, need for pain medication, treatment of nausea and vomiting and other disturbing side effects. The Aldrete scoring system is the standard for evaluating patients for discharge from Phase 1 Post Anesthesia Care Unit (PACU) and occurs when the patient achieves an Aldrete score of ≥ 8. With the newer

shorter acting anesthetics and analgesics (e.g. propofol, remifentanil, midazolam, desflurane and sevoflurane) this can occur in less than 60 min. Patients may even bypass Phase 1 recovery at the conclusion of the procedure, following monitored anesthesia care and regional anesthesia. Studies are underway to determine the safety and outcome of patients bypassing PACU after receiving general anesthesia. The Phase 2, or step-down intermediate recovery is the area which is unique to the ambulatory surgical patient. It is during this phase that the patient is evaluated for being 'home-ready'. The patient's ability to be discharged home should not be confused with being 'street-fit'. The latter requires a more prolonged period of time beyond hospital discharge, and is influenced by the surgical procedure and anesthesia. Because residual impairment of cognitive ability has been demonstrated to persist even beyond the patient's discharge, patients must be cautioned not to make important decisions, drive or operate machinery for at least 24 h postoperatively [8].

Guidelines for safe ASU discharge include stable vital signs, return to baseline orientation, ambulation without dizziness, minimal pain, nausea/vomiting and minimal bleeding at the surgical site. Following sedation, regional or general anesthesia, the patient must have a responsible 'vested' adult escort, who preferably could stay with the patient overnight. The ability to maintain oral fluids postoperatively as a criterion for discharge has been challenged, as insistence on drinking may in fact provoke continued nausea and vomiting. The ability to void must be evaluated in light of the surgical procedure and the type of anesthetic administered. Urinary retention postoperatively may occur due to the inhibition of the micturition reflex from surgical manipulation, excessive fluid administration distending the bladder, pain and anxiety or from spinal and epidural anesthesia. When voiding is required for discharge, patients may either be catheterized as a single attempt or left with an indwelling catheter. Some surgeons have discharged patients home with adequate instructions to contact their physician or return to the emergency room should urinary retention persist [8].

A scoring system that allows for a more standardized assessment of home readiness has been developed. This simple, cumulative index, the Post-Anesthesia Discharge Scoring System (PADSS) assigns numerical values (from 0–2) for the following five recovering categories: vital signs, activity and mental status, pain, nausea/vomiting, surgical bleeding, intake and output. The total score is 10, and patients are considered to be fit for discharge when they have achieved a score of ≥ 9. The majority of patients can be discharged within 1–2 h after out-patient anesthesia [9].

Each facility must develop policies and procedures regarding discharge criteria and delineate the responsibility for discharging patients home from the ASU. This includes evaluation and examination of the patient by the physician or the application of rigorously accepted discharge criteria if a physician does not perform this evaluation. In addition, the patient must be given written postoperative instructions with information about where to seek emergency medical assistance including phone numbers of the surgeon, ASU, and the nearest emergency room. Patients should be cautioned about performing functions that require complete recovery of cognitive ability. Proper adherence to these discharge criteria and documentation protect against premature discharge of patients with the potential for unanticipated hospital admission, return for emergency care, postoperative complications or legal repercussions.

How do these processes affect outcomes? Although the incidence of complications following ambulatory surgery is rare, they can occur and should be monitored. Several outcome studies have reported that the rate of hospital admission following ambulatory surgery averages about 1–2% (range from 0.1–9%) [10]. However, the majority of admissions were due to surgical causes (e.g. more extensive surgery, observations for bleeding) rather than anesthesia or medically related. Warner et al. reported that major morbidity e.g. perioperative MI, stroke, respiratory failure, pulmonary embolus within 30 days of ambulatory surgery were quite rare, and in fact, occurred at a frequency less than the general population [11]. Twersky et al. reported a 3.1% readmission rate of patients within 30 days following discharge [12,13]. The majority of return visits were to the emergency room (64%), with bleeding, pain and fever among the most common reasons for return. Over 50% of patients returned within 1 week, 75% within 2 weeks. Only urology and gynecology patients had significantly greater rates than other surgical specialities. Discharge criteria were met in all patients, except 2 who refused hospital admission. By enforcing discharge criteria, the return rates can be kept to a minimum. Like unanticipated hospital admissions, return hospital visits occur infrequently and are related to surgical factors rather than anesthesia or medical conditions [13]. Several retrospective studies identify that patients report minor side effects such as muscle aches, drowsiness, headache, dizziness, sore throat, nausea and vomiting. Many of these minor sequelae prevented patients from resuming their normal activities. In a study by Philip [14], 62% of patients required an average of 3.2 days to resume their normal activity, primarily limited by general malaise and surgical discomfort. When patients are informed prior to discharge (accompanied with written instructions) about the anticipated minor sequelae, they are more prepared to deal with the symptoms. It does not appear that the occurrence of these symptoms reflect inappropriate discharge. In a prospective study of patients activity at 24

h postoperatively, Chung et al. [15] reported that the common symptoms reported in decreasing frequency are pain, headaches, drowsiness, dizziness and nausea/vomiting. These are directly related to the type of surgery. Patients undergoing gyn laparoscopy, general surgery and orthopedic procedures were more likely to require additional days to recover. Forty percent of patients that experienced 1 or more symptoms postoperatively were unable to resume their normal activity at 24 h, as compared to only 20% with no postoperative symptoms.

Patient satisfaction appears to be extremely high following ambulatory surgery. Most of the patient satisfaction data comes from comparative anesthetic techniques, in which patients are asked at the conclusion of their surgery whether they were satisfied with the anesthetic they received, or when conducted by nursing staff postoperatively. To date, there has been no well-formulated scientific study addressing patient satisfaction. Dr. Donald Fung, of Sunnybrook Health Science Centre in Ontario, Canada, has developed a rigorous tool for measuring patient satisfaction in ambulatory surgery. He has identified determinants of patient satisfaction for various components of perioperative ambulatory surgery. These include assessment of the physical structure and environment, the technical content of care, interpersonal relationships among hospital personnel and patients, the efficiency of care and the outcomes of care. Future application of these determinants will allow a more rigorous assessment of patient satisfaction.

Discharge criteria do identify factors associated with outcome. Outcome, however, is primarily influenced by the surgical procedure. Nonetheless, anesthetic and surgical techniques aimed at reducing postoperative symptoms will facilitate the patient's functional ability and resumption of normal activities.

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