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Predictive Factors in Global and Anesthesia Satisfaction in Ambulatory Surgical Patients

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Background: Patient satisfaction is one of the variables that affect the outcome of health care and the use of health-care services. As more procedures are performed on an ambulatory basis, the role of the anesthesiologist becomes more important. To improve the delivery of care, the predictors of dissatisfaction with the entire process (global dissatisfaction) of ambulatory surgery and with anesthesia itself must be identified. The authors conducted a hypothesis-generating study to identify predictors; specifically, they hypothesized that satisfaction with anesthesia was a predictor of global satisfaction with ambulatory surgery and that 24-h postoperative symptoms were a predictor of satisfaction with anesthesia.

Methods: The authors prospectively studied 5,228 consecutive patients having surgery in the ambulatory setting during a 1-yr period. Preoperative, intraoperative, and postoperative variables were gathered and patient satisfaction was assessed using a postoperative telephone questionnaire administered 24 h after operation in 2,730 respondents. Significant univariate variables and clinically important variables were entered into multiple logistic regression models. Qualitative data on dissatisfaction were obtained by asking patients' reasons for dissatisfaction.

Results: Sixty-eight of the 2,730 respondents (2.5%) had global dissatisfaction with ambulatory surgery. Nine of these patients were dissatisfied with anesthesia. Dissatisfaction with anesthesia was associated with a 12-fold increase in global dissatisfaction ($P = 0.0001$). Thirty-one of the 2,730 respondents (1.1%) were dissatisfied with anesthesia. An increasing number of symptoms occurring 24 h after operation was associated with an $\exp(0.28 \times N)$ -fold increase in dissatisfaction with anesthesia for N number of symptoms ($P = 0.0001$). Qualitative data showed that the most common reason for global dissatisfaction with ambulatory surgery was personal preference for inpatient care (26%), whereas intraoperative and

postoperative adverse outcomes were the major causes of dissatisfaction with anesthesia (88%).

Conclusions: Dissatisfaction with anesthesia is a predictor of global dissatisfaction with ambulatory surgery. An increasing number of symptoms 24 h after operation is a predictor of dissatisfaction with anesthesia. The rate of global dissatisfaction and anesthesia dissatisfaction is very low. The predictors from this model need to be validated by a second data set from either this or another center. Given the low rate of dissatisfaction, a focused study testing specific interventions to improve patient satisfaction would be difficult. (Key words: Anesthesia; ambulatory. Patient satisfaction: global; anesthesia.)

CONTINUOUS improvement in quality is an important part of our practice, and as ambulatory surgery is becoming a major trend, data on outpatient satisfaction are needed. Patient satisfaction affects the outcome of health care and the use of health-care services.¹ Therefore, it is important to identify the reasons and the risk factors for patient dissatisfaction.

The study of patient satisfaction involves difficult issues, including the diversity of definitions and patient perceptions. Patient satisfaction has been defined by objective and subjective measures. Objective measures are defined by the provider of care; that is, patient progress and treatment outcome.²⁻⁴ Subjective measures evaluate patient satisfaction by determining "the provider's success at meeting those client values and expectations which are matters on which the client is the ultimate authority."⁵ However, patients have been found to be more concerned with the interpersonal skills of hospital staff than with their technical skills and competence.⁶ Expressions of patients are usually biased to please staff and to avoid repercussions for negative care appraisal.^{7,8} Thus, in defining the quality of care as perceived by patients, all three aspects—the structure of the institution, the processes that enable the services to be delivered, and the outcome, including patient satisfaction—should be assessed to obtain a more holistic and reliable result.

Methodologic issues include the reliability and validity of the instruments used to measure satisfaction and the need to use multivariable modeling to identify predictors in observational studies. Most studies use questionnaires com-

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pleted by the patient,⁹⁻¹² whereas interviewing is the preferred method because the response rate is more favorable.¹³ None of the previous outpatient studies have tried to establish the validity and reliability of the instrument.⁹⁻¹² In addition, these surveys have provided only basic frequencies and qualitative data.^{9,12,14}

The aim of the current study was to identify the reasons for and predictors of global satisfaction and satisfaction with anesthesia in patients having surgery in the ambulatory setting. Because surgery was the main event, we hypothesized that satisfaction with anesthesia was a predictor of global patient satisfaction. We also hypothesized that the number of postoperative symptoms was a predictor of satisfaction with anesthesia.

Materials and Methods

Patients

After we received approval from the institutional ethics committee, we screened 6,285 consecutive adult patients having day surgery who were cared for by anesthesiologists in the Ambulatory Surgery Unit at The Toronto Hospital, Western Division, from March 1, 1993 through February 28, 1994. We collected data prospectively on 5,228 eligible patients. For the collection of perioperative data, written informed consent was not required by the ethics committee. Informed consent was obtained for the postoperative telephone interview. Because of logistics, we excluded patients if they were non-English speaking or if they required long-distance telephone calls. We excluded 1,057 patients for these two reasons. We also excluded patients who did not achieve the discharge criteria and were subsequently admitted and patients who were discharged successfully but were unexpectedly admitted later. Altogether, 90 patients were excluded for the latter two reasons. We decided that these excluded patients had substantially different clinical courses and would not be suitable candidates to reflect the risks of dissatisfaction in most patients receiving ambulatory care.

Measurements

The anesthesiologists entered the preoperative data (table 1) on a specifically designed anesthesia record. Clinical management of the patients was left to the discretion of the anesthesiologists.

Intraoperative and immediate postoperative adverse events were documented on a standardized check-off form. Each adverse outcome was accompanied by a concise definition printed directly on the form. The form accompanied the patient into the postanesthesia care unit and the ambulatory surgical unit, where nursing staff recorded any adverse outcomes the patients experienced. Both anesthesiologists and nurses were instructed on standardized definitions and recording of variables before the start of the study. Patients were discharged when they achieved a score of ≥ 9 on the Postanesthesia Discharge Scoring System.¹⁵ Charting was completed at the time of discharge, and the data were reviewed systematically the next day by a research assistant and an experienced anesthesiologist (F.C.). Telephone interviews were conducted 24 h after surgery using a standardized questionnaire. A random data check for inconsistencies such as time range, procedure, and sex matching was performed by one of the investigators (D.T.) to monitor the quality of data entry. The ambulatory surgical unit nurses trained in research interviewing were responsible for the telephone calls. Patients would be considered nonrespondents if they refused to give consent before operation for the postoperative telephone interview or if the nurses could not contact the patient after two attempts.

Intraoperative adverse events as determined by the anesthesiologist included intubation-related events; respiratory events such as desaturation, laryngospasm, bronchospasm, aspiration, and pneumothorax; fluid and metabolic events; cardiac events such as hypotension, hypertension, cardiac ischemia, tachycardia, bradycardia, dysrhythmia, and cardiac arrest; neurologic events such as excessive sedation and agitation before induction and seizure; and miscellaneous events such as muscle rigidity, drug incident, anaphylaxis, malignant hyperthermia crisis, and skin injury.

The immediate postoperative adverse events as determined by the nursing staff included respiratory events such as desaturation, hypoventilation, upper airway obstruction, reintubation in the postanesthesia care unit, pulmonary edema, bronchospasm, pneumothorax, aspiration; fluid-renal-metabolic events such as hypovolemia, oliguria, urinary retention, and abnormal results of blood tests; cardiac events such as hypotension, hypertension, bradycardia, tachycardia, dysrhythmia, ischemia, and cardiac arrest; neurologic events such as excessive pain, excessive agitation, residual paralysis, confusion, seizure, and excessive sedation; miscellaneous events such as nausea and vomiting, hypothermia, shivering, unplanned admission or a second surgery, anaphylaxis, excessive bleeding, and other surgical complications.

The following information was also collected: duration

§ Harju E: Patient satisfaction among day surgery patients in a central hospital. *Quality Assurance in Health Care* 1991; 3:85-8.

Table 1. Characteristics of the Telephone Call Respondents and Nonrespondents

	Respondents (n = 2,730)	Nonrespondents (n = 2,112)	P Value*
Sex (%) (M/F)	31:69	29:71	
Age (yr)	46 ± 20	46 ± 20	
ASA status (%)	I:II:III	I:II:III	
	57:39:4	56:38:5	
Body mass index (kg/m ²)	26 ± 8	25 ± 12	
Anesthesia technique (%)			
Monitored anesthesia care	39	38	
General anesthesia	59	59	
Regional anesthesia	1	1	
Chronic pain block	1	1	
Surgery (%)			<0.001
Ophthalmology	35	35	
Laparoscopy	8	3	
D&C	24	39	
Arthroscopy	13	7	
Others	20	17	
Anesthesia duration (min)	52 ± 30	48 ± 30	<0.0001
PACU duration (min)	52 ± 26	47 ± 22	<0.0001
ASU duration (min)	108 ± 59	102 ± 54	<0.0001
OR adverse outcomes (%)	3.4	3.4	
PACU adverse outcomes (%)	9.7	8.7	
ASU adverse outcomes (%)	8.3	7.2	

Values for age, body mass index, anesthesia duration, PACU duration, and ASU duration are expressed as mean ± SD.

* P values indicate significance of difference between respondents and nonrespondents.

of anesthesia, duration of stay in the postanesthesia care and ambulatory surgical units, assessment scores on admission and discharge to the postanesthesia care and ambulatory surgical units, medications given, intraoperative and postoperative physiologic variables, and discharge location.

The 24-h postoperative adverse events as determined by the patient were assessed through the standardized postoperative telephone interview. The presence of 12 postoperative symptoms was assessed: pain over incision, headache, muscle ache, malaise, drowsiness, dizziness, nausea, vomiting, fever, hoarseness, sore throat, and bleeding. The severity of these symptoms was evaluated by four criteria: a pain score designed to differentiate mild, moderate, or severe incisional pain; a subjective 24-h postoperative functional score whereby the patients were asked to rate their functional level on the day of the interview on a scale of 0 to 100%; whether the patients took medications for symptoms; and whether they returned to the emergency room or consulted a physician for medical care. In addition, patients were asked whether they were given information regarding preparation for surgery, time of the procedure, ambulatory surgery routine, estimated time of discharge, need for proper escort home, and postoperative self-care.

Global satisfaction with ambulatory surgery and satisfaction with anesthesia were also assessed through the standardized 24-h postoperative telephone interview. Global satisfaction with ambulatory surgery was evaluated by asking whether the patient would return to the same facility for a similar ambulatory surgery. Global dissatisfaction was defined by the patients' refusal to return to the same facility for a similar surgery. Satisfaction with anesthesia was evaluated by asking the patient to rate the care as poor, good, or excellent. Dissatisfaction with anesthesia was defined as a rating of "poor." Qualitative data on global satisfaction and satisfaction with anesthesia were assessed by asking the patient to give their reasons for dissatisfaction in open-ended questions.

Reliability and Validity

The reliability of the standardized check-off form for adverse events was confirmed by the high degree of chance-corrected agreement ($k > 0.9$) between the data included in the anesthesia record and the data on the check-off form. The same anesthesiologist was responsible for reviewing the anesthesia record throughout the 1-yr period to ensure consistency of data. The reliability of the 24-h postoperative

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telephone questionnaire was confirmed by a high degree of inter-rater agreement ($k > 0.9$) when both the research assistants and the nurses interviewed each of the first 200 patients separately. The validity of the questions about satisfaction were established by a previous study.¹⁶ As another validity check, specific reasons were sought if the patients expressed global dissatisfaction with ambulatory surgery or dissatisfaction with anesthesia.

Statistical Analysis

Univariate analysis was used to test the significance of each independent variable (appendix 1) with regard to the rate of global satisfaction with ambulatory surgery or satisfaction with anesthesia separately, using the chi-squared test, Fisher's exact test, or Student's *t* test. Because of the small number of dissatisfied patients (the outcome), there was a limitation in the number of variables we could enter into the multiple logistic model. We chose to enter into the model the most significant variables from the univariate analysis and the variables that had a biological or psychological basis. These variables were entered into backward stepwise multiple logistic regression models. For the global satisfaction model, we entered four variables; for the anesthesia satisfaction model, we entered three variables before a quasi-separation of the data resulted. We continued to eliminate variables as long as the resulting model was not significantly different from the initial model. Probability values were adjusted to less than 0.001 for multiple comparisons. Odds ratios are presented to indicate the direction and magnitude of the effect. Standard errors of the estimate are presented to indicate precision. All data were analyzed by using the Statistical Analysis Systems software (version 6.08; SAS, Cary, NC).

Results

Altogether, 5,228 patients were studied. Successful telephone interviews were conducted with 2,730 patients (52%). Forty percent of the 5,228 patients refused telephone interviews when approached before operation for their consent. The other reasons for unsuccessful telephone interviews were inability to contact (5.7%) and unspecified (1.7%). Table 1 shows the characteristics of the respondents and nonrespondents.

Global Dissatisfaction

Sixty-eight of the 2,730 respondents (2.5%) would decline to return to the same unit for a similar surgery. Table 2 shows the variables that were significant by univariate anal-

ysis. Nine of the 68 dissatisfied respondents (13%) were dissatisfied with anesthesia, compared with 22 of 2,662 satisfied respondents (0.83%). Some of the significant variables were highly correlated, such as the presence of postoperative symptoms and the presence of more than three symptoms. In these cases, only one of the correlated variables was entered into the multivariable model. Because of the limited number of outcomes, the following variables were entered into an initial model: age, satisfaction with anesthesia, number of 24-h postoperative symptoms, and presence and absence of adequate instructions. The final model showed that dissatisfaction with anesthesia and the number of postoperative symptoms were significant according to the probability value. Dissatisfaction with anesthesia was associated with a 12-fold increase ($P = 0.0001$) in global dissatisfaction with ambulatory surgery. An increasing number of 24-h postoperative symptoms was associated with an $\exp(0.24 \times N)$ -fold increase in dissatisfaction with anesthesia for *N* number of symptoms ($P = 0.0001$). Table 3 shows qualitative data on reasons of global dissatisfaction with ambulatory surgery. The social reasons that led to dissatisfaction included living alone, having difficulty with arranging transport, and difficulty in arranging escort or additional help at home.

Dissatisfaction with Anesthesia

Thirty-one of the 2,730 respondents (1.1%) rated anesthesia as "poor." Table 4 shows variables that were significant by univariate analysis. Simple logistic regression found that increasing number of 24-h postoperative symptoms predicted dissatisfaction with anesthesia ($P = 0.0001$; fig. 1). Only one of the correlated variables was entered into the multivariate models. Owing to the small number of dissatisfied patients, only the following variables were entered into an initial model: general anesthesia and monitored anesthesia care as two dummy variables and the number of postoperative symptoms. The final model showed that the number of postoperative symptoms was significant according to the probability value. An increasing number of 24-h postoperative symptoms was associated with an $\exp(0.28 \times N)$ -fold increase in dissatisfaction with anesthesia for *N* number of symptoms ($P = 0.0001$; table 4). Table 5 shows qualitative data on the reasons for dissatisfaction with anesthesia. Intraoperative and postoperative adverse events were the major causes for dissatisfaction with anesthesia (88%).

Discussion

The degree of satisfaction with ambulatory surgery and with anesthesia in this study was very high, 97.5% and

Table 2. Variables Associated with Global Dissatisfaction (68/2,730 patients)

Discrete Variable	Total No. of Patients with Variable	No. of Dissatisfied Patients with Variable (% of patients with variable)	P Value†		
Univariate model					
Dissatisfaction with anesthesia	31	9 (29)	<0.001		
Dissatisfaction with nursing care	17	3 (18)	<0.001		
PACU events	259	14 (5.4)	0.002		
Inadequate preoperative information	112	10 (8.9)	<0.001		
Inadequate information on time of procedure	42	5 (12)	<0.001		
Presence of postoperative symptoms	1,949	59 (3)	0.006		
Presence of >3 postoperative symptoms	353	25 (7)	<0.001		
Need for postoperative analgesics	1,216	45 (3.7)	<0.001		
Continuous Variable					
	Satisfied Patients	Dissatisfied Patients	P Value		
Univariate model					
Median no. of postoperative symptoms (interquartile range)	1 (2)	2 (2)	<0.0001		
Functional score*	70 ± 23	55 ± 27	<0.001		
Variable	Parameter Estimate	Standard Error	P Value	Odds Ratio (OR)	Confidence Interval (OR)
Multivariable model					
Dissatisfaction with anesthesia	2.5	0.44	0.0001	12	5.2–29
No. of postoperative symptoms	0.24	0.053	0.0001	1.3	1.1–1.4

* Values are mean ± SD.

† P values indicate significance of difference between satisfied and dissatisfied patients.

98.9%, respectively. We found that an increasing number of 24-h postoperative symptoms was a predictor of dissatisfaction with anesthesia and that dissatisfaction with anesthesia was a predictor of global dissatisfaction with ambulatory surgery.

The incidence of dissatisfaction was so low that we could not help but ask if these patients were simply a deviant group. Some of the dissatisfied patients in this study did give trivial reasons. However, patient expressions are usually biased to please staff and to avoid repercussions for negative care appraisal.^{7,8} Therefore, what we found could be an under-representation of the true picture. By identifying the areas for improvement for a small number of patients, we could be advancing the quality of care for an anonymous majority of patients.

The qualitative section of the questionnaire consisted of patients' actual responses for the open-ended question. Eight patients were dissatisfied globally due to social reasons (table 4). These were elderly patients having ocular procedures who were either living alone or had difficulty

in arranging transport or escort or additional help at home. A more detailed preoperative inquiry by the surgeons would have led to prior arrangement for home care and thus could have prevented these situations. Similarly, under unmet expectations, for patients who reported "did not see the doctor while in pain" or "did not see the doctor postop for surgical finding," these situations could be avoided if the surgeons had clarified with the patients that the operating room schedule in fact did not always permit them to see the patients immediately afterward. For the one patient who reported "too early an admission," she only waited for 2 h, and her complaint reflected inadequate knowledge of the routine running of the day surgery unit. The same applied to the patients who reported "inefficient or omitted prep tests." The patient who reported "uncomfortable chairs" had expected to rest in a bed. And this again reflected inadequate explanation on our part. Of patients who reported "awareness" during monitored anesthesia care, they had expected to be unconscious during the procedure, and thus they reported anesthesia dissatis-

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Table 3. Reasons for Global Dissatisfaction (68 Patients)

	No. (%)
Personal preference for inpatient care	18 (26)
Adverse outcome	
Intraoperative	3 (4.5)
Inadequate anesthesia during monitored anesthesia care	1
Multiple attempts at lumbar epidural for chronic pain	1
Multiple attempts at intravenous cannula	1
Postoperative	6 (9)
Fever	1
Drowsiness	1
Pain over incision	1
Shivering	1
Dizziness	1
Rough night	1
Social	8 (12)
Living alone	
Difficulty in arranging transport	
Difficulty in arranging escort or additional help at home	
Structure	10 (15)
Long waiting period	5
<2 h	1
2-4 h	2
Unspecified	2
Unmet expectations	8
Lack of communication from doctor about surgical finding	2
Did not see doctor when in pain	1
Early morning admission	1
Preoperative tests inefficient/omitted	2
Resident doing surgery	1
Chairs uncomfortable	1
Inadequate nursing	3 (4.5)
Rushed to go home	1
Delayed message to relatives	1
Not enough information	1
No reason given	20 (29)

fact (table 5). We interpreted this as a lack of communication between the anesthesiologists and patients. Similarly, for patients who reported "student anesthetizing," patients were not told that the anesthesia resident was in fact a qualified physician in training and that resident training was an essential feature in a teaching hospital. For the patient who reported "problems with lumbar puncture in the OR," the lumbar puncture was performed without complication after a few attempts. The anesthesiologist had failed to assure the patient that multiple attempts were not unusual; we also interpret this as a lack of communication. Lack of communication, however, was not recognized in the initial phase of the study. Subsequently, communication

was not included in the closed-ended entries in the postoperative questionnaire and was not tested in the statistical modeling.

Most patients are ready to go home 1-2 h after the conclusion of anesthesia and surgery.¹⁷ Patients with persistent symptoms of pain and nausea or vomiting in the ambulatory surgical unit stayed longer in the unit and had more 24-h postoperative symptoms. Postoperative symptoms of pain, sore throat, hoarseness, drowsiness, headache, dizziness, fever, and nausea or vomiting can occur.¹⁸ Because an increase in the number of 24-h postoperative symptoms was associated with an increase in dissatisfaction with anesthesia, efforts should be made to develop effective strategies to prevent and treat postoperative symptoms in patients having surgery in the ambulatory care setting. Simple techniques such as perioperative hydration of 20 ml/kg for fluid-restricted patients undergoing general anesthesia in ambulatory surgery is beneficial.¹⁹ Alleviating dehydration with adequate fluid therapy reduces the incidence of postoperative symptoms such as thirst, nausea, dizziness, and drowsiness in the postanesthesia care unit, in the ambulatory surgery unit, and 24 h after operation. A multimodal approach of narcotic, nonsteroidal anti-inflammatory drugs, and local anesthesia infiltration is effective in treating postoperative pain in patients having outpatient laparoscopic cholecystectomy.²⁰ Thus by reducing the number and severity of postoperative symptoms, satisfaction with anesthesia can be increased.

During the initial development of the study questionnaire, we conducted a literature search that identified possible predisposing factors for global dissatisfaction with ambulatory surgery: demographic characteristics, information factors, access factors, structure factors, nursing care,^{9,21-24} and postoperative minor sequelae.^{9,11} Demographics included age, sex, ASA physical status, and previous hospitalization.^{1,3,4,16} Information factors included postoperative self-care instructions¹¹ and information given by physicians.¹ Access factors included parking availability and location of the hospital.^{1,9} Structure factors included waiting time and admission time.^{9,12}

Previous hospitalization was a factor in patient satisfaction in some of the inpatient studies.^{1,3,4,16} Because ambulatory care is completely different from inpatient care, we conjectured that patient expectations for ambulatory surgery would not be much influenced by their previous hospital care. Therefore, we did not consider this factor.

Abramowitz *et al.*¹⁶ found that global satisfaction is the most powerful predictor of the intent to recommend the service. Although dissatisfaction with professional competence appears to be one of the factors in consumers' deci-

Table 4. Variables Associated with Dissatisfaction with Anesthesia (31/2,730 Patients)

Discrete Variable	Total No. of Patients with Variable	No. of dissatisfied Patients with Variable (% of patients with variable)	P Value		
Univariate model					
Anesthesia technique			<0.001		
Monitored anesthesia care	1,032	13 (1.3)			
General anesthesia	1,596	16 (1)			
Regional anesthesia	21	0			
Chronic pain block	32	2 (6.3)			
ASU events	222	7 (3.2)	0.004		
Presence of >3 postoperative symptoms	352	12 (3.4)	<0.001		
Continuous Variable	Satisfied Patients	Dissatisfied Patients	P Value		
Median no. of postoperative symptoms (interquartile range)	1 (2)	2 (4)	<0.001		
Variable	Parameter Estimate	Standard Error	P Value	Odds Ratio (OR)	Confidence Interval (OR)
Multivariable model Mean no. of postoperative symptoms	0.28	0.07	0.0001	1.3	1.2-1.5

sions to change providers,²⁵ the intent to return to a hospital is related to access factors such as parking availability and location of the hospital rather than to satisfaction with hospitalization.²⁶ In this study, patients were asked whether they would return to the same facility if they needed a similar surgery again, and none of the reasons for global dissatisfaction were related to access factors. This confirms that the intent to return is a valid indicator of patient satisfaction.

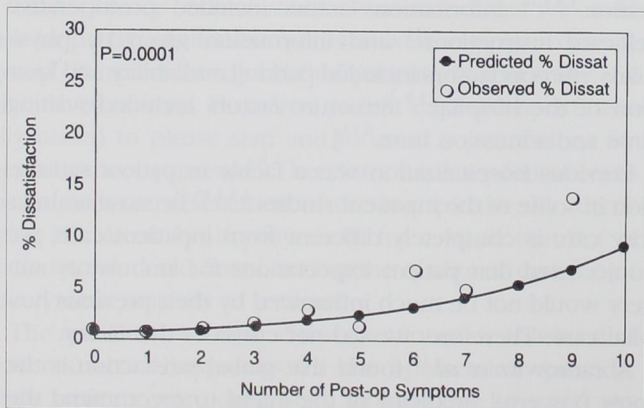


Fig. 1. Predicted (●) and observed (○) dissatisfaction with anesthesia (simple logistic regression, P = 0.0001).

This study, with 2,730 respondents, is the largest satisfaction survey thus far reported for ambulatory surgery. The conceptual problems with patient satisfaction might be insurmountable, because perceptions of quality of care are

Table 5. Reasons for Dissatisfaction with Anesthesia (31 Patients)

	No. (%)
Personal preference for inpatient care	2 (7)
Adverse outcome	
Intraoperative	20 (65)
Intravenous	5 (16)
Inadequate anesthesia during monitored anesthesia care	7 (23)
Pain	6
Claustrophobia under the drapes	1
Lack of communication	8 (26)
Awareness during monitored anesthetic care	6
Student anesthetizing	1
Problem in the OR during lumbar epidural	1
Postoperative	7 (23)
Sore throat	3
Nausea and vomiting	4
Miscellaneous	
Denied the request for Valium postoperatively	1 (3)
No reason	5 (16)

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subjective. Methodologically, however, we improved on previous studies by including a large number of patients and by using a questionnaire that had been proved reliable and valid in a previous study.¹⁶ We used closed-ended questions that allowed standardization of responses for statistical analysis and included qualitative open-ended questions about reasons for dissatisfaction that validated the results from the closed-ended questions.

The main limitations of this study were the low response rate and the small sample of dissatisfied patients. In future studies, the reasons for dissatisfaction should be asked of both satisfied and dissatisfied patients, to give a validity check of the global satisfaction questions for both groups. To obtain a more complete picture, other aspects of the experience that reflect the efficiency of the service delivery should also be assessed, such as the operating room turn-over time and the time between the fulfillment of discharge criteria and actual discharge. Specific items on various dimensions of care would allow us to directly test other dimensions in statistical modeling.

In summary, we found a high rate of patient satisfaction with ambulatory surgery and with anesthesia. The presence of postoperative symptoms significantly contributed to patients' satisfaction or dissatisfaction with anesthesia. Satisfaction with anesthesia significantly contributed to patients' overall satisfaction with the ambulatory surgery experience. The qualitative data on reasons of dissatisfaction suggested that lack of communication was an important dimension in dissatisfaction. However, this dimension was not tested in the statistical modeling. Given the low incidence of dissatisfaction, focused research on interventions that would improve patients' satisfaction would be an enormous challenge.

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References

1. Doering E: Factors influencing inpatient satisfaction. *Qual Rev Bull* 1983; 9:291-9
2. Bond S, Thomas LH: Measuring patients' satisfaction with nursing care. *J Adv Nurs* 1992; 17:52-63
3. Abdellah F, Levine E: Developing a measure of patient and personnel satisfaction with nursing care. *Nurs Res* 1957; 5:100-8
4. Locker D, Dunt D: Theoretical and methodological issues in sociological studies of consumer satisfaction with medical care. *Soc Sci Med* 1978; 12:283-92
5. Donabedian A: *The Definition of Quality and Approaches to Its Measurement*. Ann Arbor, Michigan, Health Administration Press, 1980
6. Sira ZB: Affective and instrumental components in the physician-client relationship. *J Health Soc Behav* 1980; 21:170-80
7. Pearson A, Durand I, Punton S: Determining quality in a unit where nursing care is the primary intervention. *J Adv Nurs* 1989; 14:269-73
8. Raphael W: Do we know what the patients think? A survey comparing the views of patients, staff and committee members. *Int J Nurs Stud* 1967; 4:209-23
9. Philip BK: Patients' assessment of ambulatory anesthesia and surgery. *J Clin Anesth* 1992; 4:355-8
10. King B: Patient satisfaction survey: Day surgery unit. *Aust Clin Rev* 1989; 9:127-9
11. Read D: Day surgery: A consumer survey. *N Z Med J* 1990; 103:369-71
12. Fallo PC: Developing a program to monitor patient satisfaction and outcome in the ambulatory surgery setting. *J Post Anesth Nurs* 1991; 6:176-80
13. French K: Methodological considerations in hospital patient opinion surveys. *Int J Nurs Stud* 1981; 18:7-32
14. Urbach GM, Edelist G: An evaluation of the anesthetic techniques used in an outpatient unit. *Can Anaesth Soc J* 1977; 24:401-7
15. Chung F: Are discharge criteria changing? *J Clin Anesth* 1993; 5:648-88
16. Abramowitz S, Coté AA, Berry E: Analyzing patient satisfaction: A multianalytic approach. *Qual Rev Bull* 1987; 4:122-30
17. Chung F: Recovery pattern and home readiness after ambulatory surgery. *Anesth Analg* 1995; 80:896-902
18. Chung F, Un V, Su J: Postoperative symptoms 24 hours after ambulatory anaesthesia. *Can J Anaesth* 1996; 43:1121-7
19. Yogendran S, Asokumar B, Cheng DCH, Chung F: A prospective randomized double-blinded study of the effect of intravenous fluid therapy on adverse outcome on outpatient surgery. *Anesth Analg* 1995; 80:682-6
20. Michaloliakou C, Chung F, Sharma S: Preoperative multimodal analgesia facilitates recovery after ambulatory laparoscopic cholecystectomy. *Anesth Analg* 1996; 82:44-51
21. Nelson-Wernick E, Currey H, Paylor P: Patient perception of medical care. *Health Care Manage Rev* 1981; 6:65-72
22. Fleming G: Hospital structure and consumer satisfaction. *Health Serv Res* 1981; 16:43-63
23. Carey RG, Posavac EJ: Using patient information to identify areas for service improvement. *Health Care Manage Rev* 1982; 7:43-8
24. Laing GP: Hospitalization: Is it always a negative experience? *The Canadian Nurse* 1974; 73:35-7
25. Megivern K, Halm MA, Jones G: Measuring patient satisfaction as an outcome of nursing care. *J Nurs Care Qual* 1992; 6:9-24
26. Houston CS, Wayne EP: Patients' perceptions of hospital care. *Hospitals* 1972; 46:70-4

Appendix. List of Independent Variables Tested by Univariate Analysis

Global Satisfaction	Anesthesia Satisfaction
Sex	Sex
Age	Age
Body mass index	Body mass index
ASA	ASA
Satisfaction with anesthesia	
Satisfaction with nursing care	
Anesthesia technique	Anesthesia technique
Monitored anesthesia care	Monitored anesthesia care
General anesthesia	General anesthesia
Regional anesthesia–operative	Regional anesthesia–operative
Chronic pain blocks	Chronic pain blocks
Local anesthesia	Local anesthesia
Airway management	Airway management
Nonintubated	Nonintubated
Intubated	Intubated
Laryngeal mask airway	Laryngeal mask airway
Services	Services
ENT	ENT
General surgery	General surgery
Gynecology	Gynecology
Ophthalmology	Ophthalmology
Orthopedic	Orthopedic
Plastics surgery	Plastics surgery
Other	Other
Duration (min)	Duration (min)
Anesthesia/PACU/ASU	Anesthesia/PACU/ASU
Adverse events	Adverse events
OR/PACU/ASU	OR/PACU/ASU
No. of postoperative symptoms (0–12)	No. of postoperative symptoms (0–12)
Presence/absence of any postoperative symptoms	Presence/absence of any postoperative symptoms
Pain scores: none, mild, moderate, severe	Pain scores: none, mild, moderate, severe
> or <3 postoperative symptoms	> or <3 postoperative symptoms
12 specific postoperative symptoms	12 specific postoperative symptoms
Pain over incision, headache, muscle ache, malaise, drowsiness, dizziness, nausea, vomiting, fever, hoarseness, sore throat, and bleeding	Pain over incision, headache, muscle ache, malaise, drowsiness, dizziness, nausea, vomiting, fever, hoarseness, sore throat, and bleeding
Perioperative instructions	Perioperative instructions
Preoperative preparation	Preoperative preparation
Time of surgery	Time of surgery
Routines of the ASU unit	Routines of the ASU unit
Time of discharge	Time of discharge
Availability of escort	Availability of escort
Discharge nursing instructions	Discharge nursing instructions
Rate of return to the ER	Rate of return to ER
Pain medications yes/no	Pain medications yes/no
Functional scores (0–100%)	Functional scores (0–100%)