Risk Factors Associated with Fast-Track Ineligibility After Monitored Anesthesia Care in Ambulatory Surgery Patients

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BACKGROUND: Fast-tracking after ambulatory anesthesia has been advocated as a pathway to improve efficiency and maximize resources without compromising patient safety and satisfaction. Studies reporting successful fast-tracking focus primarily on anesthesia techniques and not on specific patient factors, surgical procedure, or process variables associated with unsuccessful fast-tracking. We performed this retrospective study to implement a process for improving fast-tracking, measure change over time, and identify variables associated with patients unable to fast-track successfully after monitored anesthesia care.

METHODS: A fast-track protocol for all patients receiving monitored anesthesia care based on the Modified Aldrete Score was instituted. It consisted of written policy changes and weekly review at physician and nursing department meetings for the first month, followed by monthly feedback during a 6-mo intervention period. Data collected for a 3-mo baseline and the consecutive 6-mo intervention period included fast-track status, surgical service and procedure, surgeon and anesthesiology provider, age, gender, ASA status, total time in operating room, and total postoperative time (end of surgery to actual discharge).

RESULTS: Three hundred and thirty-two cases were completed during the 3-mo baseline period, and 641 cases were completed during the 6-mo intervention period. Fast-track success rate improved from 23% to 56%, $P < 0.001$. Independent risk factors for fast-track ineligibility identified by multivariate regression analysis were significant for patients <60 yr-old, ASA III versus I, general surgery versus orthopedics and ophthalmology, month after implementation, and total postoperative time. Total postoperative time was significantly shorter by 64 min in the fast-track group, $P < 0.001$.

CONCLUSION: Fast-track success rate can be improved and sustained over time by education and personnel feedback. We identified risk factors that were significantly associated with fast-track ineligibility. If those factors are found to be associated with fast-track ineligibility in a prospective investigation, they should enable development of multidisciplinary patient and procedure-specific guidelines for fast-tracking.

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Fast-tracking after ambulatory anesthesia, the process of directly transferring a patient from the operating room (OR) to a step-down or phase 2 recovery area in the Ambulatory Surgery Unit (ASU) and bypassing the postanesthesia care unit (PACU), has become an acceptable postoperative pathway to improve efficiency without compromising safety and patient satisfaction.[1–4] A recent review article[1] advocates a major role for anesthesiologists in driving this patient-care paradigm by selecting perioperative care regimens to facilitate this process. Although this practice was introduced several years ago, data about how often it is occurring is still being collected and refined. Additionally, no universally accepted practice guidelines or selection criteria have been developed.

It seems, therefore, that obstacles still persist that interfere with patients bypassing the PACU from the OR. Most published studies on fast-tracking[4–7] have focused on identifying anesthetic techniques associated with successful fast-track or fast-track eligibility after general anesthesia (GA). Fewer[2,8] have considered strategies for fast-tracking monitored anesthesia care (MAC) and they have not investigated patient, procedure, and process variables associated with fast-track failures *per se*. Although familiar with this growing practice, our facility had not embraced a formal fast-track program.

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We therefore undertook this study to achieve two goals:

(1) To implement a process to improve fast-track success and measure change over time and (2) to identify possible variables associated with patients who cannot be fast-tracked after MAC. By expanding their understanding of this process, anesthesiologists can further enhance their role in facilitating fast-track surgery and developing multidisciplinary fast-track practice guidelines that define inclusion and exclusion criteria.

METHODS

In October 2005, fast-track protocol was implemented that consisted of a written policy that enabled ambulatory surgery patients to be fast-tracked after MAC directly from the OR to step-down ASU area. MAC is the anesthesia category designated on the OR schedule for cases intended to receive a continuum of sedation, analgesia and anxiolysis (minimal, moderate, "conscious," or deep sedation) and excluded GA, central neuraxial blockade, or unsupplemented local anesthesia. Physician and nursing education regarding these policy changes was conducted in regular weekly meetings of the Departments of Anesthesiology, OR, and ASU nursing conferences for the first month. Laminated cards with fast-track criteria using the Modified Aldrete Score[9] were posted in each OR These are the standard criteria that our PACU regularly uses and were familiar to all staff. Our hospital-based multisurgical specialty ASU has dedicated areas and staff for preoperative, PACU, and step-down care with integrated ORs. At the conclusion of surgery, the anesthesia attending and resident would evaluate the patient to determine eligibility for fast-track. Patients achieving a score of ≥9 were eligible to bypass the PACU and be transferred from the OR to an ASU step-down and recover until discharged from the facility. Ineligible fast-track patients would be managed in the usual manner in the PACU and subsequently transferred to the step-down ASU area until discharge. All patients undergoing MAC were considered eligible, and a PACU admission for any reason was deemed a fast-track failure. After policy implementation, feedback was provided monthly to members of the anesthesiology department and OR nurses via conferences and emails on the number of successful fast-track cases completed. OR logs and medical records were reviewed for 3 mo (July to September 2005) before the intervention to obtain baseline demographic information and trends in postoperative PACU and step-down ASU admissions before policy implementation and for the 6-mo intervention period (Oct 2005 to March 2006).

Data collected for the intervention period included fast-track status, surgical service and procedure, surgeon and anesthesiology provider, age, gender, ASA status, total time in OR, and total postoperative time (end of surgery to discharge home). Chart review of all available charts was conducted for ineligible fast-track cases to identify reasons for failure. Failures were categorized as clinical: excessive sedation, hemodynamic/cardiovascular instability, other clinical, or nonclinical/administrative reason based on available details recorded. In addition, a chart review of patients having an untoward outcome, defined as a readmission to PACU or hospital admission, was conducted to determine its association with fast-tracking. IRB approval with Health Insurance Portability and Accountability Act waiver was obtained for this retrospective study.

Fisher's exact test was used to compare fast-track rates across time, first for all cases, then stratified by surgery type. For patients with multiple admissions, only the earliest admission during the entire postintervention study period was used in analyses. Univariate and multivariate logistic regression analyses were conducted to identify risk factors associated with failure during the intervention period only. Predictors used were patient age (dichotomized after univariate analysis as ≤60 vs >60); ASA status; surgical service; total time in OR; time from OR to discharge; patient left OR after 5 PM; and calendar month (trichotomized after univariate analysis as Oct 2005, Nov to Dec 2005, and Jan to Mar 2006). A generalized mixed model analysis was used to determine whether the identity of the anesthesia provider predicted inability to fast-track; Statistical analyses were performed using SAS 9.13 (Cary, NC). Differences were considered significant at $P < 0.05$.

RESULTS

During the baseline period, 332 MAC cases were completed; during the 6-mo intervention period, 641 cases. Five of the baseline and 20 of the intervention period surgeries represented repeats for patients returning for other procedures and were excluded from the analysis; leaving $n = 327$ for the baseline and 621 for the intervention periods. There was a significant increase between baseline and intervention periods in percentage successfully fast-tracked (Table 1). Although improvement was noted over the 6-mo period as a whole, improvement occurred after the second intervention month and peaked at month 4. Variability in improvement by surgical specialty was noted particularly for general surgery, orthopedics/podiatry, and urology. Ophthalmology was fast-tracked 81% of the time before protocol implementation and its increase to 91% was not significant. Most of the other services had very few cases done under MAC and their changes were not statistically significant (Table 2).

Univariate Analysis

Mean age, gender, ASA class, total OR time, and proportion of cases out of OR after 5 PM were not different between the groups (Table 3). Patients in the intervention group ranged from 12 to 98 yr old. Total postoperative time was significantly shorter by 64 min

Table 1. Fast-Track: Baseline Versus Intervention Period

	Fast-track/total (%)	P
Baseline (July to Sept)	74/327 (23)	
Intervention month 1 (Oct)	19/87 (22)	1.000*
Intervention month 2 (Nov)	44/113 (39)	0.008*
Intervention month 3 (Dec)	37/87 (43)	0.578*
Intervention month 4 (Jan)	81/112 (72)	<0.001*
Intervention month 5 (Feb)	66/85 (78)	0.477*
Intervention month 6 (Mar)	100/137 (73)	0.678*
Total intervention period	347/621 (56)	<0.001†

* Versus previous period.

† Versus baseline period.

Table 2. Fast-Track by Specialty: Baseline Versus Intervention Period

	Baseline n (%)	Intervention n (%)	P
GEN	2/119 (2)	95/227 (42)	<0.001
OPH	61/75 (81)	119/131 (91)	0.053
GU	0/13 (0)	19/37 (51)	<0.001
ORT/POD	6/89 (7)	100/175 (57)	<0.001
ENT	2/15 (13)	4/18 (22)	0.665
GYN	1/5 (20)	0/12 (0)	0.294
PAIN	2/3 (67)	4/5 (80)	1.000
PLA	0/5 (0)	6/16 (38)	0.262

GEN = general surgery; OPH = ophthalmology; GU = urology; ORT/POD = orthopedics/podiatry; ENT = otolaryngology; GYN = gynecology; PAIN = anesthesia pain procedures; PLA = plastic surgery.

in the fast-track group compared with the fast-track ineligibles ($P < 0.001$). Mean time in the step down area, though recorded in less than a quarter of the cases, was 83 ± 54 min with no significant differences between the two groups.

Patients over 60-yr-old, ophthalmology and orthopedic/podiatry patients were more likely than general surgery patients to be fast-tracked. The proportion of fast-track cases increased markedly after the first month of intervention and again after the third month. Variability in fast-track ineligibility due to the identity of the anesthesiology provider was not statistically significant ($P = 0.197$), nor was ineligibility a function of the time that patients left the OR.

Further evaluation of the general surgery failure rate identified three procedures: breast biopsy and related excisions, insertion of central venous infusion ports, and vascular access procedures for renal failure patients, with fast-track rates of 36, 30, and 25%, respectively. Pairwise comparisons of these three procedures to all other general surgery procedures (fast-track rate of 50%) showed no significant differences among these groups, most likely as overall numbers were insufficient to permit more detailed analysis.

Multivariate Analysis

Most of the significant risk factors in the univariate analysis remained significant after controlling for other factors. Risk factors for fast-track ineligibility were significant for: patients younger than 60 yr, ASA III cases compared with ASA I, and general surgery when compared with ophthalmology and orthopedics/podiatry are less likely to be fast-tracked; month of implementation was also a predictor of failure (Table 4).

No patients were readmitted to the PACU after successful fast-tracking, although three patients who were ineligible were admitted to the hospital. Reasons for fast-track ineligibility were determined by authors after reviewing available charts (56% of cases) and categorized as clinical: excessive sedation on admission to PACU (70%), hemodynamic/cardiovascular instability requiring monitoring (13%) and nonclinical or administrative (17%), including staff unfamiliar with policy, or unavailable wheelchairs for transportation. Type of drugs used for MAC sedation was not extracted during chart review in sufficient number of cases to permit analysis by drug type.

DISCUSSION

We were able to demonstrate significant improvement in the fast-track rate to 56% overall, with a maximum rate of 78%, following a system that subjectively fast-tracked only 23% of MAC cases. Before formal policy implementation, the few MAC cases that were fast-tracked were primarily ophthalmology. Particularly impressive was the increase from single digit rates for general surgery and orthopedic/podiatry specialties to a 42% and 57% respectively, fast-track rate that was sustainable and absent any untoward outcomes. The ability for a policy change to favorably affect an ASU when dealing with a multitude of patient, provider, and other facility issues is encouraging. Coupled with this improvement was the ability to acknowledge that not all cases can be successfully fast-tracked. We identified that patients younger than 60 yr, ASA III cases compared with ASA I, and general surgery when compared with ophthalmology and orthopedics/podiatry were more likely to be ineligible.

Practice change can create unintended consequences that might be good or bad.[10] We sought to implement the fast-track process for all surgical services after MAC in the hope of improving care without unintended negative consequences. Untoward patient outcomes, as measured by readmission to PACU or hospital admission, were not increased. Time required to achieve a state of home-readiness and discharge are influenced by a wide variety of anesthesia, surgical and patient factors. MAC techniques generally have shorter discharge times and fewer side effects, allowing us to target a new program with a high projected success rate. We felt that our staff would respond better to change if we started initially with MAC, identified more clearly those factors that do not permit patients to bypass the PACU and then developed guidelines based on our findings. The motivating forces were that the staff would experience improved efficiency of the OR and better utilization of PACU and ASU resources in a busy facility, even when no economic benefits were anticipated.

Table 3. Univariate Analyses of Fast-Track Versus Fast-Track Ineligible

	Fast-track (N = 347)	Fast-track ineligible (N = 274)	Odds ratio	95% confidence interval
Age (yr) (mean ± SD)	58 ± 17	53 ± 18	0.98	0.97–0.99
Age >60 (vs ≤60)	169 (49%)	86 (31%)	0.48	0.35–0.67*
Gender M (vs F)	145 (42%)	101 (37%)	0.81	0.59–1.1
ASA class				
1	58 (18%)	51 (19%)		
2 (vs 1)	203 (64%)	159 (59%)	0.89	0.58–1.4
3 (vs 1)	50 (16%)	59 (22%)	1.3	0.79–2.3
4 (vs 1)	4 (1%)	2 (1%)	0.57	0.10–3.2
OR time (h) (mean ± SD)	1.17 ± 0.50	1.17 ± 0.63	1.00	0.75–1.3
Postoperative time to discharge (h) (mean ± SD)	1.53 ± 0.78	2.58 ± 1.38	2.9	2.3–3.7*
Out of OR after 5 PM	19 (5%)	25 (9%)	1.7	0.93–3.2
Surgery type (vs GEN)				
OPH	119/131 (91%)	12 (8%)	0.073	0.038–0.14*
GU	19/37 (51%)	18 (49%)	0.68	0.34–1.4
ORT/POD	100/175 (57%)	75 (43%)	0.54	0.36–0.80*
ENT	4/18 (22%)	14 (78%)	2.5	0.80–7.9
PLA	6/16 (38%)	10 (62%)	1.2	0.42–3.4
Month of intervention				
1st (vs 4th–6th)	20	70 (fail rate 78%)	10	5.7–17*
2nd–3rd (vs 4th–6th)	80	117 (fail rate 59%)	4.2	2.9–6.1*
4th–6th	246	86 (fail rate 26%)		

Intervention period only (N = 621).

GEN = general surgery; OPH = ophthalmology; GU = urology; ORT/POD = orthopedics/podiatry; ENT = otolaryngology; PLA = plastic surgery; OR = operating room.

* Significant odds ratio and confidence interval at $P < 0.05$.

Table 4. Multivariate Logistic Regression Predicting Fast-Track Ineligible

	Adjusted odds ratio	95% confidence interval
Age >60 (vs ≤60)	0.51	0.29–0.89*
ASA class		
2 (vs 1)	1.3	0.69–2.3
3 (vs 1)	2.3	1.02–5.4*
Postoperative time (h) to discharge	2.5	1.9–3.2*
Out of OR after 5 PM	1.9	0.76–4.8
Surgery type (vs. GEN)		
OPH	0.072	0.029–0.18*
GU	0.94	0.34–2.6
ORT/POD	0.43	0.25–0.75*
ENT	1.8	0.48–6.8
PLA	1.3	0.32–5.2
Month of intervention		
1st (vs 4th–6th)	16	7.6–35*
2nd–3rd (vs 4th–6th)	4.9	2.9–8.4*

Intervention period only (N = 496).

GEN = general surgery; OPH = ophthalmology; GU = urology; ORT/POD = orthopedics/podiatry; ENT = otolaryngology; PLA = plastic surgery; OR = operating room.

* Significant odds ratio and confidence interval at $P < 0.05$.

Apfelbaum et al.[2] conducted a similar study with five ambulatory surgical centers that underwent a multidisciplinary educational program for all anesthetics with significant improvement from baseline of 16% to 58% overall; MAC cases improved from 32% baseline to 90%. More than 80% of patients from all five sites bypassed the PACU. That study was limited to a 1-mo baseline period, 1-mo educational period, and 1 mo of outcome monitoring without assessing long-term impact. We included a 3-mo baseline period to account for surgeon variability in OR scheduling and a 6-mo period of implementation to determine a more sustained pattern that might be influenced by seasonal variation in type of surgery and impact of combined education and outcome. Because our intervention fell short of 90% as reported by others,[2,8] further analysis was warranted. Possible reasons for failure were extracted from the charts, though not on all patients; yet one correctable administrative reason warrants further comment. Patients who would otherwise be fast-track eligible were transferred to the PACU in stretchers as nursing staff lacked sufficient wheelchairs to transport patients out of the OR. When this became apparent in the early months of protocol implementation, measures were taken to reduce that obstacle, including ordering additional wheelchairs and permitting patients to be transported by stretcher to the ASU, and transferring patients to a recliner chair. Like Apfelbaum et al., we had to evaluate the physical constraints and logistical details of the new patient flow and to succeed rapidly without significant overhead to implement the program. Several staff members were not familiar with the policy and only after several months of the program had this become a recognized process. In general, physicians will resist change to traditional practice unless there is compelling evidence or overarching benefit for patient-centered care.[11] Some attending anesthesiologists felt the patient's level of sedation was too deep to safely transfer them to a step-down area where they would remain unmonitored. Our anesthesiologists had not previously experienced fast-tracking patients after

GA; therefore, even the patients who received deep sedation under MAC were felt to need PACU monitoring. Our study had limited power to detect a difference in the fast-track rate by individual members of the anesthesia department or the surgical staff.

Although improvement was noted overall, only the last 3 mo during the study period showed significant change from baseline at 74%, suggesting that new processes take time and constant education and feedback are necessary to sustain results. The fact that this system is still working without continued feedback speaks to the strength of the process in our institution. Nevertheless, certain factors will preclude patients from fast-tracking even after MAC.

We identified ASA III is an independent predictor of fast-track ineligibility, though older age was not a factor. The American Society of Post Anesthesia Nurses Position Statement[12] limits fast-tracking PACU to ASA I and II patients. Our study provides evidence for this exclusion policy. Other studies[3,4,13] excluded patients with comorbidities and over the age of 60–65 yr from fast-tracking PACU. Our study included patients aged 12–98 yr, and our outcome suggests the safety of fast-tracking for elderly patients undergoing MAC. In fact, patients younger than 60 yr were more likely to be fast-track ineligible, which might have been related to the more frequent use of deep sedation for MAC in the younger patients, resulting in drowsy patients at the conclusion of surgery. This study provides specific information on patients of all ages and support for fast-track in older but medically stable patients.

Type of surgery is also likely to influence eligibility, as was noted for some general surgery procedures. Further study by specific ambulatory procedures is needed.[1,14] Since several studies[1,2,4] have already evaluated the impact of specific short-acting anesthetics and the use of multimodal pain and emetic therapies to facilitate more rapid recovery and discharge, we were able to focus on variables other than choice of anesthetics that influence fast-tracking.

Length of postoperative stay in our study was associated with failure, which was consistent with additional time spent in the PACU. Although total postoperative time in the fast-track group was, on average, 64 min shorter, there were no differences in the time spent in phase 2 areas. Therefore, the total time saved was directly related to the mean PACU time in the fast-track ineligible group. This could affect utilization of nursing staff and consumption of material resources. Other studies reported similar or less time saved postoperatively.[2,3] Determining cost savings with respect to recovery is complex, and depends on a variety of inputs.[4,15] We did not have the objective of producing meaningful improvements in cost reduction, as no economic analysis was conducted though, like others, we found a significant decrease in total postoperative time. This is an important finding, as some practitioners are hesitant to adopt the fast-track process because of concern that it merely shifts nursing care to a step-down area.[4,16]

In a similar retrospective study, White et al.[8] reported that 90% of MAC cases were able to be discharged within 60 min when transferred to a PACU bypass area. Close to 60% of their failed cases were for nonmedical reasons, though they did not elaborate on these reasons. By developing strict criteria for admission to their designated PACU bypass area, they were able to ensure a high success rate. Successful fast-tracking is also governed by physical space arrangements and flexibility in care plans. Although our facility has two distinct PACU and step-down ASU recovery areas, fast-tracking might occur more often where they are combined and nursing ratios can be flexible. Our fast-track postoperative time was longer than others,[7,8] which might relate to nonmedical factors such as lack of available adult escort, noncompletion of discharge orders, and lack of review of instructions with patients. By using the results of this study, we can work with nurses and surgeons toward minimizing the medical and nonmedical factors that contribute to a prolonged stay before expanding the program to all anesthetics. This approach is consistent with others[17] that acknowledge the need for multidisciplinary strategies to improve perioperative management and outcomes.

We acknowledge several limitations in our study. First, the study was conducted in a single institution, a hospital-based ASU that is also a teaching hospital, thereby limiting its applicability in community hospitals, ambulatory surgery centers, or office-based practices. Charting patient information was not performed by dedicated research personnel, and reasons for ineligibility and anesthesia techniques were not recorded in a consistent fashion, limiting proper analysis. Our data collection concluded at discharge, and we have no follow-up postdischarge, or patient satisfaction measurements that should be part of assessing fast-track programs. Although we used the Modified Aldrete Scoring system because of staff familiarity and not the White's fast-tracking scoring system,[6] we do not believe that our fast-track rate might have changed, as MAC cases are less likely than GA to report significant postoperative nausea and vomiting or pain, the two components not included in the Modified Aldrete Score. Finally, the associations we identified in the multivariate analysis cannot be compelling unless they are borne out by a prospective investigation.

CONCLUSION

Building on earlier published studies, we sought to further characterize what patient, procedure, and process variables might be associated with fast-track success and failure. Our study identified three variables that are known before surgery: age, ASA status, and surgical procedure that can be incorporated into a triage system to identify patients who are not suitable for fast-tracking. This may help facilities reassign recovery resources to achieve the enhanced efficiency. Further evaluation of these variables, in conjunction with clinical discharge criteria and at other facilities and for other anesthesia techniques, is needed.

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REFERENCES

1. White PF, Kehlet H, Neal JM, Schricker T, Carr DB, Carli F; the Fast-Track Surgery Study Group. The role of anesthesiologists in fast-track surgery: from multimodal analgesia to perioperative medical care. Anesth Analg 2007;104:1380–96
2. Apfelbaum JL, Walawander CA, Grasela TH, Wise P, McLeskey C, Roizen MF, Wetchler BV, Korttila K. Eliminating intensive postoperative care in same-day surgery patients using short-acting anesthetics. Anesthesiology 2002;97:66–74
3. Duncan PG, Shadnro J, Bachand R, Ainsworth L. A pilot study of recovery room bypass ("fast-track protocol") in a community hospital. Can J Anaesth 2001;48:630–6
4. Song D, Chung F, Ronayne M, Ward B, Yogendran S, Sibbick C. Fast-tracking (bypassing the PACU) does not reduce nursing workload after ambulatory surgery. Br J Anaesth 2004;93:768–74
5. Joshi GP, Twersky RS. Fast tracking in ambulatory surgery. Ambul Surg 2000;8:185–90
6. White PF, Song D. New criteria for fast-tracking after outpatient anesthesia: a comparison with the modified Aldrete's scoring system. Anesth Analg 1999;88:1069–72
7. Coloma M, Zhou T, White PF, Markowitz SD, Forestner JE. Fast Tracking after Outpatient laparoscopy: reasons for failure after propofol, sevoflurane, and desflurane anesthesia. Anesth Analg 2001;93:112–5
8. White PF, Rawal S, Ngueyn J, Watkins A. PACU fast-tracking: an alternative to "bypassing" the PACU for facilitating the recovery process after ambulatory surgery. J Perianesth Nurs 2003;18:247–53
9. Aldrete JA. The post-anesthesia recovery score revisited. J Clin Anesth 1995;7:89–91
10. Ganz DA, Wenger NS, Roth CP, Kamberg CJ, Chang JT, MacLean CH, Young RT, Solomon DH, Higashi T, Min L, Reuben DB, Shekelle PG. The effect of a quality improvement initiative on the quality of other aspects of health care: the law of unintended consequences. Med Care 2007;45:8–18
11. Armstrong D. Clinical autonomy, individual and collective: the problem of changing doctors' behavior. Soc Sci Med 2002;55:1771–7
12. ASPAN Standards of Care: Position Statement on Fast-Tracking. Cherry Hill, NJ: American Society of Perianesthesia Nurses, 2000
13. Mamaril M. Fast-tracking the postanesthesia patient: the pros and cons. J Perianesth Nurs 2000;15:89–93
14. Kehlet H, Dahl JB. Anesthesia, surgery and challenges in postoperative recovery. Lancet 2003;362:1921–8
15. Dexter F, Macario A, Manberg PJ, Lubarsky DA. Computer simulation to determine how rapid anesthetic recovery protocols to decrease the time for emergence or increase the phase 1 postanesthesia care unit bypass rate affect staffing of an ambulatory surgery center. Anesth Analg 1999;88:1053–63
16. Williams BA, Kentor ML, Williams JP, Vogt MT, DaPos SV, Harner CD, Fu FH. PACU bypass after outpatient knee surgery is associated with fewer unplanned hospital admissions but more phase II nursing interventions. Anesthesiology 2002;97:981–8
17. Dahl JB, Kehlet H. Perioperative medicine—a new subspecialty or a multidisciplinary strategy to improve perioperative management and outcome. Acta Anaesthesiol Scand 2002;46:121–2