BRIEF COMMUNICATION

New Criteria for Fast-Tracking After Outpatient Anesthesia: A Comparison with the Modified Aldrete's Scoring System

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The modified Aldrete's scoring system (1) is commonly used for determining when patients can be safely discharged from the postanesthesia care unit (PACU) to either the postsurgical ward or to the second stage (Phase II) recovery area. Recently, these discharge criteria have also been used in the operating room (OR) to determine the fast-track eligibility of outpatients undergoing ambulatory surgery (2,3). Because fast-tracking in the ambulatory setting implies taking a patient from the OR directly to the less extensively monitored Phase II step-down unit, this scoring system may not be adequate after ambulatory procedures requiring general anesthesia because it fails to consider common side effects that have traditionally been treated in the PACU (e.g., pain, nausea, and vomiting). Therefore, a new fast-track scoring system that incorporates the essential elements of the modified Aldrete system, as well as an assessment of pain and emesis, has been proposed (4).

We hypothesized that using this new scoring system to determine a patient's fast-track eligibility would reduce the need for nursing interventions to administer parenteral medications in the Phase II recovery area. The times to fast-track eligibility were compared using the modified Aldrete and new fast-track criteria in outpatients undergoing laparoscopic surgery with one of three standardized general anesthetic techniques.

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Methods

Recovery data from 216 consenting female outpatients undergoing either laparoscopic tubal ligation (LT) or cholecystectomy (LC) procedures at the University of Texas Southwestern Medical Center at Dallas from January 1997 through July 1998 were analyzed. Patients without an evaluation of the modified Aldrete score and objective assessments of pain, nausea, and vomiting at 1-min intervals after discontinuation of the maintenance anesthetics, as well as those who failed to receive both preventative analgesic and prophylactic antiemetic medications, were excluded from the data analysis.

All patients were premedicated with midazolam 2 mg IV. Anesthesia was induced with propofol 2 mg/kg IV and remifentanil 1 μg/kg IV (for LT) or with fentanyl 2 μg/kg IV (for LC). Laryngoscopy and tracheal intubation were facilitated with either succinylcholine 1 mg/kg IV (for LT) or with rocuronium 0.6 mg/kg IV (for LC). After tracheal intubation, anesthesia was maintained with one of the three anesthetics: desflurane 2%–8% (inspired), sevoflurane 0.6%–2.4% (inspired), or propofol 50–200 $\mu g \cdot kg^{-1} \cdot min^{-1}$, in combination with nitrous oxide 67% in oxygen. Supplemental bolus doses of fentanyl 25–50 μg IV were administered for persistent hypertension or/and tachycardia that did not respond to increases in the dose of the maintenance anesthetic. Muscle relaxation was maintained with bolus doses of either mivacurium 0.04 mg/kg (for LT) or rocuronium 0.15 mg/kg IV (for LC). All patients received both analgesic and antiemetic prophylaxis with ketorolac 30 (for LT) to 60 (for LC) mg IV and droperidol 0.625 mg IV 15–30 min before the end of surgery.

Early recovery status was evaluated at 1-min intervals after discontinuation of the maintenance anesthetics using both the modified Aldrete scoring system (1) and the new fast-track scoring system (Appendix 1) (4). In calculating the fast-track score, the recorded visual analog scale (VAS) scores for pain, nausea, and

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vomiting (0 = none to 10 = maximal) were assigned a descriptive term. A VAS score ≤3 was considered "mild," 4–7 represented "moderate," and ≥8 was classified as "severe." Patients were considered fast-track–eligible if they achieved a score of 10 using the modified Aldrete scoring system or a score of ≥12 (with no score <1 in any individual category) using the new scoring system. Times from discontinuation of the maintenance anesthetics to fast-track eligibility using the two scoring systems were recorded at 1-min intervals until 5 min after arrival in the PACU, and subsequently at 5-min intervals until the patient achieved fast-track eligibility using both scoring systems.

Data were analyzed using one-way analysis of variance for continuous variables and χ^2 test for discrete variables. These data are expressed as means ± SD or percentages, with P values <0.05 considered statistically significant.

Results

The patient demographic data and distribution of cases were similar in the three general anesthetic groups (Table 1). Compared with the modified Aldrete criteria, use of the new criteria required a significantly longer time period to achieve fast-track eligibility with both desflurane and sevoflurane, but not with propofol (Table 2). When using Aldrete's scoring system, the times from discontinuation of anesthesia to fast-track eligibility was significantly longer in patients receiving propofol (versus desflurane or sevoflurane) anesthesia, whereas there were no differences among the three anesthetic techniques when using the fast-track scoring system. On arrival in the PACU, the percentage of patients judged fast-track–eligible using the new criteria was also significantly lower in the desflurane and sevoflurane groups, but not in the propofol group, compared with using the modified Aldrete criteria (Table 2). A significantly higher percentage of patients judged fast-track–eligible using the modified Aldrete criteria subsequently required IV analgesics and antiemetics compared with that after fast-track eligibility was achieved using the new criteria (Fig. 1). None of the patients in any anesthetic group received parenteral medications other than IV analgesics and antiemetics after surgery.

Table 1. Demographic Characteristics in the Three Anesthetic Treatment Groups

	Desflurane	Sevoflurane	Propofol
n	62	86	68
Age (yr)	33 ± 8	34 ± 11	31 ± 10
Weight (kg)	72 ± 17	77 ± 19	74 ± 16
ASA physical status (I/II)	39/23	42/44	41/27
Type of surgery (LT/LC)	40/22	40/46	40/28

Values are mean ± SD or *n*.
LT = laparoscopic tubal ligation, LC = laparoscopic cholycystectomy.

Discussion

Fast-tracking outpatients after general anesthesia has assumed increased importance in ambulatory anesthesia because of the cost-savings potential when patients are transferred directly from the OR to the less labor-intensive Phase II recovery area (5,6). Given the inherent risks of complications associated with bypassing the PACU, effective and reliable fast-track

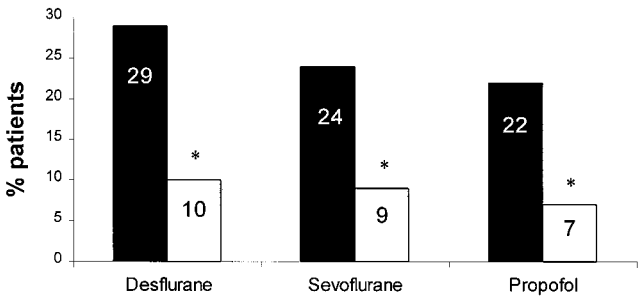

Figure 1. Percentage of patients requiring IV analgesics or antiemetics after being judged fast-track–eligible using either the modified Aldrete's criteria (■) or the fast-track criteria (□) in the three anesthetic treatment groups. *P < 0.05 versus modified Aldrete's criteria.

Table 2. Time from Discontinuation of Anesthesia to Achieving Fast-Track Eligibility and the Number of Patients Being Judged Fast-Track–Eligible on Arrival in the Phase I Postanesthesia Care Unit

	Desflurane	Sevoflurane	Propofol
Time (min) from discontinuation of anesthesia to fast-track eligibility[a]			
Aldrete's criteria	10.2 ± 4.2	12.0 ± 5.7	16.3 ± 6.4*
Fast-track criteria	15.6 ± 6.2†	16.4 ± 6.9†	17.5 ± 7.9
Fast-track–eligible on arrival in the Phase I postanesthesia care unit			
Aldrete's criteria	56 (90)	64 (74)	22 (32)*
Fast-track criteria	41 (66)†	48 (56)†	18 (26)*

Values are mean ± SD or *n* (%).
Aldrete score (1) of 10 or a fast-track score (4) of ≥12.
* P < 0.05 compared with the desflurane and sevoflurane groups.
† P < 0.05 compared with Aldrete's criteria.

criteria that would allow anesthesiologists to rapidly assess a patient's postoperative alertness, physiologic stability, and comfort level immediately before transferring the patient from the OR are clearly needed. In organizing a fast-tracking program, it is important to minimize postoperative side effects and to avoid increasing the workload for nurses in the Phase II recovery area. In a previous study (2), we determined that most nursing interventions in the PACU after laparoscopic surgery were related to the management of postoperative pain and emetic symptoms. Therefore, we used the need to administer parenteral analgesic and antiemetic medications after satisfying the PACU discharge (modified Aldrete) or fast-track criteria as a surrogate indicator of the need for additional nursing interventions in the Phase II unit had these patients actually been fast-tracked after surgery.

The modified Aldrete's scoring system is a highly acceptable criteria for discharging patients from the PACU. However, this scoring system was not designed to assess the patient's ability to bypass the PACU after major ambulatory procedures under general anesthesia. The results from this data evaluation demonstrated that 22%–29% of outpatients judged fast-track–eligible using the modified Aldrete scoring system subsequently required IV analgesics and antiemetics. Although these patients were fully oriented and had stable vital signs, they would have added to the workload of the Phase II nursing staff and may have necessitated the use of more extensive monitoring in the step-down unit. Although the new fast-track scoring system should be useful for determining which outpatients can safely bypass the PACU, these criteria were not designed for determining home-readiness after ambulatory surgery (7,8).

The new fast-track scoring system takes into consideration pain and emetic symptoms, as well as Aldrete's assessments of consciousness, physical activity, and hemodynamic and respiratory stability. Using the new fast-track criteria, significantly fewer outpatients would require IV medication for the management of pain and emesis in the step-down unit after laparoscopic surgery. Although the modified Aldrete scoring system provided a useful starting point in assessing the fast-tracking eligibility of patients in the ambulatory setting (2), using the new scoring system should help to limit the number of additional nursing interventions required in the step-down unit. Additional prospective clinical studies are required to validate the utility of this new scoring system in the clinical fast-track situation.

In conclusion, the new fast-track scoring system seems to offer advantages over the modified Aldrete's scoring system in evaluating the suitability of outpatients for bypassing the PACU after undergoing ambulatory surgery with general anesthesia.

Appendix 1

Proposed fast-track criteria to determine whether outpatients can be transferred directly from the operating room to the step-down (Phase II) unit. A minimal score of 12 (with no score <1 in any individual category) would be required for a patient to be fast-tracked (i.e., bypass the postanesthesia care unit) after general anesthesia.

Level of consciousness	Score
Awake and oriented	2
Arousable with minimal stimulation	1
Responsive only to tactile stimulation	0
Physical activity	
Able to move all extremities on command	2
Some weakness in movement of extremities	1
Unable to voluntarily move extremities	0
Hemodynamic stability	
Blood pressure <15% of baseline MAP value	2
Blood pressure 15%–30% of baseline MAP value	1
Blood pressure >30% below baseline MAP value	0
Respiratory stability	
Able to breathe deeply	2
Tachypnea with good cough	1
Dyspneic with weak cough	0
Oxygen saturation status	
Maintains value >90% on room air	2
Requires supplemental oxygen (nasal prongs)	1
Saturation <90% with supplemental oxygen	0
Postoperative pain assessment	
None or mild discomfort	2
Moderate to severe pain controlled with IV analgesics	1
Persistent severe pain	0
Postoperative emetic symptoms	
None or mild nausea with no active vomiting	2
Transient vomiting or retching	1
Persistent moderate to severe nausea and vomiting	0
Total score	14

MAP = mean arterial pressure.

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