

Ambulatory surgery adult patient selection criteria – a survey of Canadian anesthesiologists

[La sélection des patients adultes en chirurgie ambulatoire – enquête auprès des anesthésiologistes]

Zeev Friedman MD,* Frances Chung FRCPC,† David T. Wong MD†

Purpose: An increasing number of patients with complex medical problems are now considered suitable for ambulatory surgery. The purpose of this study was to identify the current clinical practice of ambulatory surgical patient selection.

Methods: A standardized questionnaire specifying 30 clinical conditions was sent to all practicing anesthesiologists who are members of the Canadian Anesthesiologists' Society. Recipients were asked to indicate if they would provide ambulatory anesthesia (yes/no answers) for an adult patient with each of those isolated conditions. A 75% agreement was considered a majority opinion.

Results: One thousand three hundred thirty-seven questionnaires were sent and 774 replies were received (57.8%). Over 75% of anesthesiologists were willing to include in their selection criteria American Society of Anesthesiologists' (ASA) physical status III, patients with low-grade angina pectoris (AP) and congestive heart failure (CHF), prior myocardial infarction, asymptomatic valvular disease, sleep apnea without use of narcotics, morbid obesity (MO) without co-morbidities, insulin dependent diabetes mellitus and malignant hyperthermia (MH) susceptible patients. Over 75% of responders found ASA IV patients, high grade AP and CHF, sleep apnea with postoperative narcotics, MO with co-morbidities and no patient escort to be unsuitable for ambulatory anesthesia.

Conclusion: Our survey demonstrated that medical conditions with extreme grades of severity (mild or severe) are associated with majority opinion to proceed or not to proceed with ambulatory surgery. Issues with over 75% agreement reflect the common practice. Similar surveys may form a part of patient selection guidelines development in the future.

Objectif : Un nombre croissant de patients ayant des problèmes médicaux complexes est maintenant admissible à la chirurgie ambulatoire. Nous avons voulu vérifier la pratique clinique courante de sélection des patients pour la chirurgie ambulatoire.

Méthode : Un questionnaire normalisé présentant 30 conditions cliniques a été envoyé à tous les anesthésiologistes en exercice, membres de la Société canadienne des anesthésiologistes. Les répondants devaient indiquer par oui ou non s'ils offriraient une anesthésie ambulatoire à un patient adulte pour chacune de ces conditions isolées. Une adhésion à 75 % était considérée comme une opinion majoritaire.

Résultats : Nous avons reçu 774 réponses pour les 1 337 questionnaires envoyés, soit 57,8 %. Plus de 75 % des anesthésiologistes étaient disposés à inclure dans leurs critères de sélection des patients d'état physique III, selon l'American Society of Anesthesiologists (ASA), qui présentent une angine de poitrine (AP) d'évolution lente et une insuffisance cardiaque congestive (ICC), un infarctus du myocarde ancien, une valvulopathie asymptomatique, de l'apnée du sommeil sans usage de narcotiques, de l'obésité morbide (OM) sans comorbidités, un diabète insulino-dépendant et les patients susceptibles d'hyperthermie maligne peranesthésique. Au-delà de 75 % des répondants ont trouvé l'anesthésie ambulatoire inappropriée pour les patients ASA IV, les cas d'AP et d'ICC de haut degré, d'apnée du sommeil avec narcotiques postopératoires, d'OM avec comorbidités et pour les patients accompagnateur.

Conclusion : L'enquête démontre que pour les conditions médicales de sévérité extrême (modérée ou sévère) une majorité accepte ou n'accepte pas la chirurgie ambulatoire. Les enjeux qui recueillent plus de 75 % d'adhésion représentent la pratique courante. Ce type d'enquête pourrait faire partie de futures directives sur la sélection des patients.

From the Departments of Anesthesia, Mount Sinai Hospital,* and the Toronto Western Hospital,† University of Toronto, Toronto, Ontario, Canada.

Address correspondence to: Dr. Frances Chung, Department of Anesthesia, Toronto Western Hospital, 399 Bathurst Street, Toronto, Ontario M5T 2S8, Canada. Phone: 416-603-5118; Fax: 416-603-6494; E-mail: frances.chung@uhn.on.ca

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AMBULATORY surgery is practiced in increasing numbers in North America due to various economical and staffing reasons. It is projected that the current movement from inpatient to ambulatory procedures will continue, and by the year 2005, outpatient surgery will represent 82% of all U.S. surgical volume.¹ Recent advances in anesthetic practice allow for rapid recovery with minimal adverse effects. Improved perioperative care, along with new minimally invasive surgical techniques, has permitted surgeons to perform an increasing array of procedures on an ambulatory basis.²

The cost-containment realized in the shift of care from inpatient to outpatient has prompted a "pushing of the envelope." The result was a change in patient selection criteria, and inclusion of patients with complex medical issues, which were deemed unfit for ambulatory surgery in the past.^{3,4} While issues such as discharge criteria have well formulated clear guidelines, the issue of patient selection remains to a large extent a matter of individual centres' preferences since there have been very few evidence-based studies on patient selection criteria.^{3,4} The aim of this study was to examine the current clinical practice of ambulatory surgical patient selection and to identify patient selection criteria in ambulatory surgery.

Methods

After Institutional Research Ethics Board approval, a standardized questionnaire with a prestamped return envelope was sent to all practicing anesthesiologists who are members of the Canadian Anesthesiologists' Society. Recipients were asked to indicate if they would provide ambulatory anesthesia for an adult patient with each of the presented isolated conditions. Answers were limited to yes/no only with an option for comments at the end of the questionnaire. A second questionnaire was sent two months later to all non-responding anesthesiologists.

Although no specific ambulatory surgical procedure was proposed, the accompanying letter explained that these patients might undergo surgeries such as: laparoscopic cholecystectomy, knee arthroscopy or operative hysteroscopy and may require general anesthesia (GA).

The questionnaire specifies 30 clinical situations divided into several sections (Appendix). First, a section dealing with general patient status as reflected by American Society of Anesthesiologists (ASA) physical status class III and IV, since some centres still adhere to ASA I and II ambulatory surgery patients only. Following is a section on cardiac issues dealing with angina pectoris [AP; (class II–IV since AP class I is

routinely accepted for ambulatory surgery)] and congestive heart failure (CHF) at increasing severities. Also presented are myocardial infarction (MI) and valvular disease. Morbid obesity (MO) of different grades and associated co-morbidities and obstructive sleep apnea with different anesthetic scenarios compose the next section. The last part of the questionnaire contains nine other miscellaneous controversial issues. All these issues reflect current controversies in ambulatory anesthesia as reflected in the literature or lack of it.

The responses were entered into a computerized database for analysis. Analyses were conducted on a descriptive basis for the complete set of results. A 75% agreement rate was chosen as a cutoff point for representing majority opinion. This was selected by choosing a more conservative number than the one used in the methodology of the ASA surveys for its guideline formulation process.

Results

We sent out 1,337 questionnaires and received 627 (46.8%) replies within two months. A total of 790 (59%) questionnaires were received after the second invoice. Sixteen questionnaires were unanswered for different reasons and excluded. There were 166 unanswered questions within the answered questionnaires.

Over 90% of anesthesiologists were willing to include in their selection criteria ASA III patients, patients with AP Canadian Cardiovascular Society Functional Classification class II, prior (more than six months before surgery) MI, CHF - New York Heart Association class I, asymptomatic valvular disease, low-grade MO without co-morbidities and insulin dependent diabetes mellitus (IDDM). Over 90% of responders found patients with AP class IV, CHF class IV, and severe MO with co-morbidities to be unsuitable for ambulatory anesthesia. The full results are reported in Table I.

When looking at the over 75% agreement mark, malignant hyperthermia susceptible (MHS) patients were also found acceptable for ambulatory surgery (82%). Answers on issues with over 75% agreement to proceed with surgery are reported in Table II. Over 75% agreement not to proceed with surgery also included ASA class IV patients, a prior MI one to six months before surgery, CHF class III sleep-apnea with use of GA and narcotics postoperatively, MO with a body mass index (BMI) of 35 to 44 kg·m⁻² with associated co-morbidity and patients with no escort. Answers on issues with over 75% agreement not to proceed with surgery are reported in Table III.

TABLE I Ambulatory patient selection criteria – agreement or disagreement to proceed with surgery

<i>Presented condition</i>	<i>Yes % n = 1337</i>	<i>No % n = 1337</i>
ASA III	93.9	4.5
ASA IV	17.1	82.4
AP II	96.4	2.7
AP III	66.3	32.8
AP IV	4.0	95.3
Prior MI (one to six months)	15.9	83.1
Prior MI (more than six months)	94.8	3.9
CHF I	93.5	6.1
CHF II	70.3	29.3
CHF III	16.7	82.6
CHF IV	1.3	98.4
Asymptomatic valvular disease	93.4	5.3
Sleep apnea - monitored anesthesia care (MAC)	91.5	7.2
Sleep apnea - RA w/o narcotics	97.0	2.7
Sleep apnea - RA with narcotics postop	35.3	64.0
Sleep apnea - GA w/o narcotics postop	63.4	36.0
Sleep apnea - GA with narcotics postop	14.7	84.2
Morbid obesity (BMI = 35–44 kg·m ²) w/o CVS or respiratory co-morbidity	91.0	9.0
Morbid obesity (BMI = 35–44 kg·m ²) with CVS or respiratory co-morbidity	18.1	81.7
Morbid obesity (BMI > 45 kg·m ²) w/o CVS or respiratory co-morbidity	49.5	50.1
Morbid obesity (BMI > 45 kg·m ²) with CVS or respiratory co-morbidity	4.7	95.2
Insulin dependent diabetes mellitus	92.8	6.6
Malignant hyperthermia susceptible	82.0	17.6
Proven malignant hyperthermia	49.7	49.5
Substance abuse	69.0	29.8
Monoamine oxidase inhibitor treatment	69.5	29.6
Sickle cell anemia	53.2	45.5
Chronic renal failure	72.2	27.4
Age > 90	59.6	39.8
No escort	11.2	88.1

Yes = agreement to proceed with surgery; no = disagreement. ASA = American Society of Anesthesiologists physical status; AP = angina pectoris - Canadian Cardiovascular Society Functional Classification; MI = myocardial infarction; CHF = congestive heart failure - New York Heart Association Classification; RA = regional anesthesia; GA = general anesthesia; BMI = body mass index; CVS = cardiovascular.

Discussion

In our survey we tried to address controversial issues in ambulatory surgery patient selection, while keeping the questionnaire short and clear. For analysis purposes, the patients presented are stable and optimally managed and their conditions isolated, which enabled us to get clear answers. The high return rate of almost 60% reflects the broad interest in the issue of patient selection across the variety of centres and practices.

TABLE II Ambulatory patient selection criteria with over 75% agreement to proceed with surgery

<i>Presented condition</i>	<i>% n = 1337</i>
ASA III	93.9
AP II	96.4
Prior MI (more than six months)	94.8
CHF I	93.5
Asymptomatic valvular disease	93.4
Sleep apnea - MAC (monitored anesthesia care)	91.5
Sleep apnea - RA w/o narcotics	97.0
Morbid obesity (BMI = 35–44 kg·m ²) w/o CVS or respiratory complications	91.0
Insulin dependent diabetes mellitus	92.8
Malignant hyperthermia susceptible	82.0

ASA = American Society of Anesthesiologists physical status; AP = angina pectoris - Canadian Cardiovascular Society Functional Classification; MI = myocardial infarction; CHF = congestive heart failure - New York Heart Association Classification; RA = regional anesthesia; BMI = body mass index; CVS = cardiovascular.

TABLE III Ambulatory patient selection criteria with over 75% agreement NOT to proceed with surgery

<i>Presented condition</i>	<i>% n = 1337</i>
ASA IV	82.4
AP IV	95.3
Prior MI (one to six months)	83.1
CHF III	82.6
CHF IV	98.4
Sleep apnea - GA with narcotics postop	84.2
Morbid obesity (BMI = 35–44 kg·m ²) with CVS or respiratory complications	81.7
Morbid obesity (BMI > 45 kg·m ²) with CVS or respiratory complications	95.2
No escort	88.1

ASA = American Society of Anesthesiologists physical status; AP = angina pectoris - Canadian Cardiovascular Society Functional Classification; MI = myocardial infarction; CHF = congestive heart failure - New York Heart Association Classification; GA = general anesthesia; BMI = body mass index; CVS = cardiovascular.

Our survey demonstrated that medical conditions with extreme grades of severity are associated with majority opinion to proceed or not to proceed with ambulatory surgery, while intermediate grades of severity are associated with disparity of opinion. The changing practices of ambulatory anesthesia are reflected throughout the questionnaire. In the early days of ambulatory surgery, only ASA status I to II patients were considered suitable for ambulatory

surgery. Now however, providing anesthesia to ASA III patients is a common practice among our responders (93.9%). ASA class IV patients were still considered by 82.4% of responders to be unfit for ambulatory surgery. It is interesting to note, however, that chronic renal failure patients, who by definition are ASA class IV were acceptable to 72% of responders later in the questionnaire. Conditions such as ASA I to II and AP class I, were not presented in the questionnaire since these patients are routinely anesthetized for ambulatory surgery.

When presented with cardiac issues, the majority of the responding anesthesiologists were willing to provide ambulatory anesthesia to patients with low-grade or remote symptoms i.e., AP class II (96.4%), CHF class I (93.5%), MI occurring more than six months before surgery and asymptomatic valvular disease. These conditions are clearly acceptable for ambulatory surgery.

Surprisingly, only 15.9% of responders would anesthetize a patient one to six months after his MI. The American Heart Association/American College of Cardiology Guidelines place this patient in the intermediate clinical predictor group for perioperative cardiovascular risk.⁵ Isolated intermediate predictors are considered safe for surgery, especially in the settings of ambulatory procedures which are defined as low-risk surgery. Only a recent MI, defined as less than 30 days, places the patient in the major clinical predictor group, which mandates cancellation of non-urgent surgery. So while evidence-based medicine indicates that patients presenting for surgery more than 30 days after their MI are probably safe candidates for ambulatory surgery, the majority of our responders do not practice accordingly. On the other hand, two thirds of the responders (66.3%) would agree to anesthetize an AP class III patient, which is a major clinical predictor according to the same guidelines, indicating surgery should be cancelled. These views demonstrate some of the contradictions between clinical practices, expert views and published guidelines.

MO with a BMI of 35 to 44 kg·m⁻², without added pathology, was considered an acceptable risk by 91% of the responders. As recently as 1992 a patient with a BMI > 30 kg·m⁻² was considered unsuitable for ambulatory surgery by the Royal College of Surgeons of England.⁶ Although obese patients have an increased risk of perioperative complications,⁷ the majority of units surveyed by Atkins routinely disregarded these guidelines and anesthetized patients with a BMI > 30 kg·m⁻².⁸ A study of 258 morbidly obese patients undergoing ambulatory surgery did not reveal any significant increase in unplanned admissions or complications.⁹

With the prevalence of obesity increasing worldwide, clear and current guidelines need to be formulated.¹⁰

Obstructive sleep apnea in the ambulatory surgery setting has become a more significant concern in recent years, being a critical part of preoperative patients' risk assessment. In a random sample of employed Americans aged 30 to 60 yr, 9% of women and 24% of men had index scores compatible with the diagnosis of sleep apnea.¹¹

The majority of responders in our survey (97%) would anesthetize sleep apnea patients if GA and narcotic substances are not used (e.g., regional anesthesia) but would otherwise exclude these patients. There is very little literature on sleep apnea in ambulatory surgery and no clear guidelines. The patient's estimated need for apnea monitoring and continuous positive airway pressure and the likelihood of his safe discharge without developing airway obstruction will help determine his eligibility for ambulatory surgery.

IDDM was not considered a contraindication for ambulatory surgery (92.8%). A study looking at pre-existing medical conditions as predictors of adverse events in day-case surgery did not find IDDM to be a significant predictor of intra- or postoperative events in ambulatory surgery.³

MH was presented as either proven or in a patient susceptible to it. Although the approach to both these types of patient would be identical, the answers differed. Most responders (82%) would anesthetize susceptible patients as opposed to only 49.7% for proven MH. In a study on 2,214 MHS patients, only five showed immediate postoperative mild symptoms of hyperthermia, in none of which could a clinical episode of MH be confirmed.¹² In a ten-year review of MHS children there were no incidences of clinical MH. The authors conclude that postoperative admission to the hospital solely on the basis of the MH susceptibility label is not warranted.¹³ The MH Association of the United States maintains that MHS patients can safely undergo ambulatory surgery.¹⁴ The Society for Ambulatory Anesthesia states that MHS is not a contraindication to outpatient surgery.¹⁵ MH patients undergoing a non-triggering anesthesia may therefore be safely anesthetized as ambulatory patients.

An increasing number of elderly patients are undergoing ambulatory surgery. Close to 60% of responders would provide anesthesia to patients over 90 yr old. Previous studies have shown that elderly patients have a higher incidence of any intraoperative event (adjusted odds ratio, 1.4) and a twofold higher risk for intraoperative cardiac event.⁴ These risks do not constitute a contraindication for ambulatory surgery but this population may require more careful management.

Sickle cell patients are accepted by some centres for short procedures with minimal blood loss and no tourniquet use. Since even the recommendations on hemoglobin levels before surgery are not decisive, no single measure can replace good clinical judgment on appropriateness for ambulatory surgery.¹⁶ Recent guidelines advocated increasing the hematocrit to about 30% by preoperative transfusion for patients undergoing GA.¹⁷ The authors also suggested considering overnight observation. The rationale behind this is that since acute chest syndrome has its peak effect 48 hr after surgery, a prolonged postoperative observation is desirable.

The subject of discharging a patient only with a responsible adult escort is one of the few issues discussed here for which the guidelines are clear, although this may be an issue imposed by hospital policies and legal rather than clinical considerations.^{18,19} Still, more than 10% of the responders would agree to anesthetize an unescorted patient. Some of these anesthesiologists added that they would only agree if the patient signed a release form. There is no literature to support this measure as being medicolegally adequate.

Surprisingly, approximately 70% of the responding anesthesiologists would agree to anesthetize patients with signs of acute substance abuse. Many centres include acute substance abuse in their exclusion criteria because of the increased risk for untoward cardiovascular responses, and withdrawal problems. The ASA guidelines for office-based anesthesia include even a history of alcohol or substance abuse as a factor to be considered when deciding whether anesthesia in the office setting is appropriate.²⁰ We feel that non-urgent procedures should be postponed when substance abuse is recognized.

The management of patients receiving monoamine oxidase inhibitors (MAOIs) continues to be challenging due to the potential for deleterious drug interactions. However, recent clinical experience has demonstrated the relative safety of continuing MAOIs treatment through surgery by use of specific 'MAOI safe' anesthetic techniques and/or substitution of short-acting MAOIs which do not irreversibly inhibit the enzyme.²¹ Most of our responders (69.5%) find that MAOI use should not prevent ambulatory surgery.

There are several limitations to our survey. Firstly, demographic data were not collected and we are therefore unable to stratify our results according to certain demographic subgroups (e.g., age, level of experience, affiliation with an academic centre). Secondly, surgical procedures were not specified. The omission was intentional in order to keep the survey

simple and general. Extensive procedures, which are done routinely as ambulatory cases in some centres are performed as inpatient surgery only in others.² Since we were looking at patient selection we did not find naming each of the numerous ambulatory procedures necessary. We still felt comfortable with grouping the example procedures given in the questionnaire since they are all considered low-risk procedures.⁵ The response rate of 60%, although relatively high for this wide distribution questionnaire may still have a biased response pattern influencing the results.

The survey tool was constructed to answer the salient points of patient selection and is otherwise unvalidated. Because of the limits imposed for data analysis, as well as for clarity of the questionnaire, only yes/no answers were permitted, thus limiting flexibility and possibly forcing answers, which may have been different otherwise. Although a grading scale for gradations of agreement may have also been appropriate it would have complicated the data analysis and possibly even decreased the response rate that is essential for this type of questionnaire. The ASA obtains consensus data from multiple sources, including surveys of expert consultants and of the broader population of practitioners. The surveys are in a agree/disagree format and designed so that responses are easily interpreted and differences clearly noted.^{19,22}

The data acquired in our questionnaire and in future studies may help in formulating selection criteria for ambulatory surgery. It is obvious from the answers that some of the conditions, especially those corresponding to the two extremes of the clinical range are in agreement. It is difficult to provide a "magical figure" representing an accepted consensus, although the figure of 75% agreement is often used and was a part of our results observation analysis. The ASA uses an even lower number of 65% for the average weighted response in the survey part of the guideline formulation as indicating agreement on issues.¹⁹ The 75% agreement mark on controversial issues presented in our questionnaire reflects the current practice in ambulatory anesthesia by the majority of anesthesiologists. Although a limited tool, this survey combined with prospective outcome studies may serve as a future guide for changing the individual and institutional practice of those who practice ambulatory anesthesia more conservatively.

In conclusion, our survey shows the current clinical practice of ambulatory adult patient selection regarding some controversial issues. Further population studies, especially in the areas of controversy, are needed in order to establish safety guidelines for ambulatory surgery patient selection.

Acknowledgement

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APPENDIX Questionnaire

Ambulatory anesthesia adult patient selection criteria

Would you provide ambulatory anesthesia for an adult patient with the following isolated condition? The Surgical procedure may be done under general anesthesia (for example - knee arthroscopy, gynecologic hysteroscopy or laparoscopic cholecystectomy).

American Society of Anesthesiologists' (ASA)

ASA status III stable patients	Yes	No
ASA status IV stable patients	Yes	No

Angina pectoris (AP)

AP class II - walking greater than two blocks, climbing greater than one flight of stairs	Yes	No
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AP class III - walking one to two blocks, climbing one flight of stairs	Yes	No
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AP class IV - symptoms with daily activities, or present at rest	Yes	No
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Prior MI (one to six months before surgery)	Yes	No
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Prior MI (more than six months before surgery)	Yes	No
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Congestive heart failure (CHF)

CHF, NYHA class I: symptoms with strenuous activity	Yes	No
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CHF, NYHA class II: symptoms with moderate activity	Yes	No
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CHF, NYHA class III: symptoms with mild activity	Yes	No
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CHF, NYHA class IV: symptoms at rest	Yes	No
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Asymptomatic valvular heart disease	Yes	No
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Sleep apnea

Under monitored anesthesia care	Yes	No
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Under regional anesthesia, does not require narcotic analgesia postoperatively	Yes	No
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Under regional anesthesia, requires narcotic analgesia postoperatively	Yes	No
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Under general anesthesia, does not require narcotic analgesia postoperatively	Yes	No
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Under general anesthesia, requires narcotic analgesia postoperatively	Yes	No
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Morbid obesity

(BMI = 35–44 kg·m ²) without cardiovascular or respiratory complications	Yes	No
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(BMI = 35–44 kg·m ²) with cardiovascular or respiratory complications	Yes	No
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(BMI > 45 kg·m ²) without cardiovascular or respiratory complications	Yes	No
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(BMI > 45 kg·m ²) with cardiovascular or respiratory complications	Yes	No
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Insulin dependent diabetes mellitus	Yes	No
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Malignant hyperthermia susceptibility	Yes	No
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Proven malignant hyperthermia	Yes	No
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Active substance abuse	Yes	No
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Patient on concurrent MAOI treatment	Yes	No
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Sickle cell anemia	Yes	No
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Chronic renal failure (hemo or peritoneal dialysis)	Yes	No
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Age > 90	Yes	No
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No escort	Yes	No
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If you have any additional selection criteria not addressed here, or any other comments concerning the subject please add your comments here.

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