Cardiothoracic Anesthesia, Respiration and Airway

Patients' perceptions of cardiac anesthesia services: a pilot study

[Les perceptions de patients sur l'anesthésie cardiaque : une étude pilote]

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Purpose: To develop an instrument to measure patients' perceptions of the services provided by anesthesiologists, an important indicator of quality for which little information is available.

Methods: The scale of patients' perceptions of cardiac anesthesia services (SOPPCAS) is composed of 17 Likert-type and sociodemographic questions. Data collection was conducted on T-1 (fourth postoperative day) and T-2 (15 days postoperatively). In addition, we employed the Marlow-Crowne scale and a short form of the Psychological Symptoms Index to verify the influence of social desirability and psychological distress respectively. Data analysis included a principal component analysis (PCA).

Results: One hundred seventy patients answered the questionnaires at T-1 and 133 patients at T-2. Cronbach alpha of the SOPPCAS was 0.58. PCA revealed four perioperative factors: patient/anesthesiologist interactions, preoccupations related to anesthesia, experience with anesthesia and pain management. Global mean satisfaction was 4.45 ± 0.64 (maximum score 6.0). Main items related to satisfaction were: satisfaction with premedication, empathy from anesthesiologists, pain management. Main items related to dissatisfaction were: lack of information on blood transfusion and recall of endotracheal intubation. A score of 14/20 was obtained for social desirability. Social desirability did not influence the construct of the SOPPCAS.

Conclusion: We developed, using rigorous methods, an instrument to measure patients' perceptions of the quality of cardiac anesthesia services. Global mean satisfaction with anesthesia services was moderately high contrary to previous studies where it was high. Finally, the SOPPCAS should allow anesthesiologists to improve the quality of the care they provide.

Objectif: Présenter un nouvel instrument de mesure des perceptions de patients en regard de la qualité des services anesthésiques, un indicateur important de la qualité pour lequel peu d'informations sont disponibles.

Méthode : L'échelle des perceptions de patients face aux services anesthésiques cardiaques (EPPAC) est composée de 17 items Likert et de questions sociodémographiques. La collecte de données s'est déroulée en deux temps : T-1 (quatrième jour postopératoire) et T-2 (15^e jour postopératoire, par la poste). De plus, l'échelle de Marlow-Crowne et une forme abrégée du Psychological Symptoms Index ont été utilisées pour vérifier la désirabilité sociale et la détresse psychologique. L'analyse statistique comprenait une analyse en composantes principales (ACP).

Résultats : Cent soixante-dix patients ont répondu à T-1 et 133 patients à T-2. L'alpha de Cronbach de l'EPPAC était de 0,58. L'ACP a révélé la présence de quatre facteurs : interactions patient/anesthésiologiste, préoccupations reliées à l'anesthésie, expérience de l'anesthésie, gestion de la douleur. La moyenne globale de satisfaction était $4,45 \pm 0,64$. Les aspects satisfaisants étaient : satisfaction face à la prémédication, empathie de l'anesthésiologiste, gestion de la douleur. Les aspects insatisfaisants étaient : manque d'information sur les transfusions sanguines et souvenir de l'intubation endotrachéale. Un score de 14/20 a été obtenu au Marlow-Crowne mais la désirabilité sociale n'influait pas la validité de construit de l'EPPAC.

Conclusion : Utilisant une méthodologie rigoureuse, nous avons mis au point un instrument de mesure des perceptions de patients en regard de la qualité des services anesthésiques cardiaques. Contrairement aux résultats des études antérieures, la satisfaction globale moyenne n'était que modérément élevée. Finalement, l'EPPAC devrait permettre aux anesthésiologistes d'améliorer la qualité des services qu'ils offrent.

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PATIENT satisfaction is a multidimensional concept related to factors such as life style, past experiences, future expectations and the values of both the individual and society.^{1,2} One tends to believe that evaluation by patients of the quality of services in anesthesiology is difficult or even impossible since patients are most of the time sedated or unconscious. Yet, patients are able to express their opinion on the quality of the interaction with their anesthesiologist preoperatively, peroperatively (interval between the premedication and induction) and postoperatively, as well as on the morbidity experienced after anesthesia. Their experience with anesthesia can be appraised just as well as with other medical services where several surveys intended to determine patients' assessments of their experience have been developed, provided the appropriate methodology is used.³

What patients do know and can respond to is the manner in which a service is delivered (e.g., the behaviour of the individuals providing the service) and the consequences related to that service (e.g., morbidity). Omachonu⁴ mentions that an important aspect of the evaluation of services by patients is that technical or clinical expertise cannot compensate for a caregiver's poor interaction with patients. Conversely, good-quality interaction with the service provider may positively influence a patient, even when technical aspects are more or less adequate.

Development and testing of a questionnaire on patients' perceptions of anesthesia services requires rigorous methods since perceptions are subjective and considered difficult to measure. It is also essential to employ an instrument with specific questions concurrent with other measures to verify the impact of some of the major confounding variables such as social desirability (SD) and psychological distress. These variables may influence the results obtained from a survey on patient satisfaction. Further, every new instrument needs to be tested regarding its reliability and validity to establish some of its measurement properties.

Therefore, the primary objective of this pilot study was to develop an instrument to measure the perceptions of a group of patients regarding their experience with anesthesia and to verify the performance of our novel instrument. Secondly, we report patients' perceptions of the anesthesia services provided by a group of cardiac anesthesiologists.

Methods

The study was approved by the Research and Ethics' Committees of the Montreal Heart Institute.

Conceptual framework

In order to provide a structure to guide the study, we developed a conceptual framework⁵ depicting the proposed dimensions and interrelations of patients' perceptions of anesthesia services (Figure 1). A conceptual framework is essential to present the interrelationships between the proposed variables of the concept being studied, and to guide the development of future testable hypotheses. Our framework presents perioperative factors and concomitant variables that might explain patients' perceptions of anesthesia services. These factors and variables were suggested from interviews with patients and health professionals and from our review of the literature.⁶⁻⁸

Sample

The sample was selected at random (every second eligible patient) and composed of 170 postoperative cardiac surgery patients. In order to be included, a patient: 1) had to be scheduled for elective or urgent cardiac surgery (valve replacement and/or coronary artery bypass graft, first intervention and reoperation), 2) had to understand, speak and read French, and 3) had to be from 18 to 80 yr of age. Patients were excluded if they presented with: 1) a diagnosis of a mental disorder or a mental illness (according to the patient's chart); 2) a major postoperative complication (e.g., cardiogenic shock); 3) a severe cognitive disorder (e.g., dyslexia); and 4) a cardiac diagnosis requiring life-saving surgery.

Setting

The first part of the study (T-1) took place on the pre- and postoperative cardiac surgery unit of the Montreal Heart Institute (MHI), a teaching institution affiliated with the University of Montreal. The second part (T-2) consisted of a mailing to all participants of T-1.

Instruments

1) SCALE OF PATIENTS' PERCEPTIONS OF CARDIAC ANESTHESIA SERVICES (SOPPCAS)

An extensive review of the literature⁹ did not yield any appropriate instrument to collect data on patients' perceptions of anesthesia services. It was therefore deemed necessary to develop our own instrument. The SOPPCAS was designed after interviews with health professionals and patients pre- and postsurgery as well as from suggestions from the literature.^{7,8,10,11} The principal phases followed to develop the instrument and conduct the psychometric testing of the SOPPCAS are presented in Figure 2.

Briefly, the SOPPCAS is composed of 17 Likert-type questions that explore both the period preceding

FIGURE 1

(part I) and following surgery (part II). Answers range from 1 (not at all) to 6 (very much). Some of the questions of the SOPPCAS are reversed in their scoring to prevent a bias of acquiescence (questions 4, 9, 10, 11, 12, 13, 14, 15, 17). The third part of the scale contains ten sociodemographic and medical and three open-ended questions. The Appendix presents a translated version of the SOPPCAS since we used the French version to collect the data. The English version was verified, using back-to-back translation (French to English then, English to French), by five postoperative cardiac surgery patients, three anesthesiologists, one expert in psychometry and one surgeon.

2) MARLOW-CROWNE SOCIAL DESIRABILITY SCALE (MCSD)

The MCSD scale, developed by Marlow-Crowne in 1960,¹² describes culturally approved behaviours with a low probability of occurrence. It was used in the pre-

sent study to control for respondent's eagerness to please the investigator while answering the SOPPCAS. The abridged form used herein contains 20 questions with a dichotomized choice of response (true-false). A reliable French version of the scale¹³ was used to collect data. An Alpha of 0.78 was previously obtained with the French version of the scale.¹³ Scores of the scale vary from 0 to 20. Each item related to a socially desirable behaviour is allotted one point. The higher the score, i.e., approaching 20, the higher is the tendency of the respondent to answer a questionnaire according to what he/she believes would please the investigator, thus showing a high level of SD.

3) PSYCHOLOGICAL DISTRESS ABBREVIATED FORM (SHORT FORM OF THE PSYCHIATRIC SYMPTOM INDEX-PSI OF ILFELD)

The PSI scale, created by Ilfeld in 1976,¹⁴ measures the psychological distress of respondents. We

FIGURE 2 Principal stages in the development of the SOPPCAS. Rectangles represent the different phases towards the validation of the SOPPCAS. Lozenges represent changes made to the SOPPCAS following comments of reviewers. Ellipses represent different versions of the SOPPCAS.

TABLE I Major postoperative complaints (T-1) (n=170)

Complaints	n (%)
Nausea and vomiting	136 (80.0)
Pain	120 (70.6)
Sleep disorders (insomnia, nightmares)	104 (61.2)
Voice hoarseness	93 (54.7)
Sore throat	71 (41.8)
Numbness (arms, legs)	57 (33.5)
Hallucinations	56 (32.9)
Memory loss	48 (28.2)
Headache	43 (25.3)
Visual problems	30 (17.6)
Auditory problems	10 (5.9)
Miscellaneous	76 (44.7)
(Complaints related to medical-surgical complications e.g., arrhythmias, pneumothorax. Each complaint occurred with a frequency of less than 5%)	

TABLE II Distribution of items according to the factors of the SOPPCAS (alpha, variance explained)

Factor 1: Patient / Anesthesiologist interactions (0.78, 20.55%)

- 1) Before your operation, did the anesthesiologist provide some information regarding your anesthesia?
- 2) Did you receive some information on the side effects related to anesthesia?
- 3) Did the anesthesiologist reassure you regarding your anesthesia?
- 5) Did you feel that the anesthesiologist paid attention to your questions and comments?
- 6) Before the operation, was the information given by the anesthesiologist clear?
- 7) Before the operation, did you get any information regarding the risks related to blood transfusion?

Factor 2: Preoccupations related to anesthesia (0.66, 13.32%)

- 4) Before the operation, were you afraid to feel pain after the operation?
- 9) Were you afraid to fall asleep and not wake up?
- 13) Were you afraid of dying?
- 14) Were you afraid of waking up during the operation?

Factor 3: Experience with anesthesia (0.63, 12.38%)

- 8) Did the medication you received before leaving your room for the operating room make you feel relaxed?
- 10) Do you remember having a tube down your throat after the operation?
- 11) Was the tube in your throat a painful experience?
- 17) Do you remember entering the operating room?

Factor 4: Pain management (0.47, 9.69%)

- 15) Did you suffer from pain?
- 16) Was your pain well relieved?

Question 12 obtained very low variance on all factors and lowered considerably the internal consistency of the SOPPCAS. It will be deleted from the next version of the SOPPCAS.

- 12) Did you have any nightmares after the operation?

employed a shorter form of the PSI, the mini-questionnaire (MQ). A correlation of 0.69 was obtained between the original form and the shorter form of the PSI.¹⁵ The internal consistency of the MQ is 0.89.¹⁵ This form was validated in French¹⁵ and contains questions related to three factors (depression, anxiety and anger). It includes nine Likert-type questions from 0 (not at all) to 4 (very often or extremely). Mean scores equal or close to 4 reveal patients expressing a higher level of psychological distress.

Data collection

The same investigator (SLM) interviewed all 170 patients at T-1. We felt it important that someone outside the department of anesthesia, not one of the anesthesiologists, administer the questionnaires in order to allow patients to express themselves as freely as possi-

TABLE III Responses to Likert questions of the SOPPCAS (T-1)

<i>Questions of the SOPPCAS</i>	<i>% of responses (1-2-3)</i>	<i>% of responses (4-5-6)</i>	<i>Mean score (min 1.0–max 6.0) ± SD</i>
1) Before your operation, did the anesthesiologist provide some information regarding your anesthesia?	16.8	83.2	4.61 ± 1.29
2) Did you receive some information on the side effects related to anesthesia?	37.0	63.0	3.78 ± 1.72
3) Did the anesthesiologist reassure you regarding your anesthesia?	9.2	90.8	4.86 ± 1.14
5) Did you feel that the anesthesiologist paid attention to your questions and comments?	7.9	92.1	4.96 ± 1.03
6) Before the operation, was the information given by the anesthesiologist clear?	13.6	86.4	5.19 ± 0.83
7) Before the operation, did you get any information regarding the risks related to blood transfusion?	71.5	28.5	2.29 ± 1.86
8) Did the medication you received before leaving your room for the operating room make you feel relaxed?	4.2	95.8	5.36 ± 1.00
16) Was your pain well relieved?	13.5	86.5	5.23 ± 0.99
<i>Reversed questions of the SOPPCAS</i>	<i>% of responses (4-5-6)</i>	<i>% of responses (1-2-3)</i>	<i>Mean score (min 1.0–max 6.0) ± SD</i>
4) Before the operation, were you afraid to feel pain after the operation? (reversed)	35.5	64.5	2.68 ± 1.98
9) Were you afraid to fall asleep and not wake up? (reversed)	24.8	75.2	2.22 ± 1.80
10) Do you remember having a tube down your throat after the operation? (reversed)	50.8	49.2	3.81 ± 2.13
11) Was the tube in your throat a painful experience? (reversed)	38.8	61.2	3.06 ± 2.12
12) Did you have any nightmares after the operation? (reversed)	30.0	70.0	2.45 ± 1.89
13) Were you afraid of dying? (reversed)	20.6	79.4	2.11 ± 1.61
14) Were you afraid of waking up during the operation? (reversed)	5.2	94.8	1.31 ± 1.08
15) Did you suffer from pain? (reversed)	40.6	59.4	3.15 ± 1.66
17) Do you remember entering the operating room? (reversed)	35.4	64.6	2.62 ± 2.06
<i>Global mean satisfaction</i>			4.45 ± 0.64

ble. After giving written informed consent, patients were asked to answer the SOPPCAS and the MQ on their fourth or fifth postoperative day (T-1). On average, each interview lasted about 15 min. The second part of data collection (T-2) involved a mailing of the SOPPCAS, the MQ and the MCSD along with a stamped return envelope to all patients recruited at T-1, approximately 15 days postdischarge from the hospital. T-2 was used to evaluate whether patients' responses regarding satisfaction remained the same after discharge from the hospital (stability of the content), not to evaluate the psychometric stability of the SOPPCAS since the concept of satisfaction is consid-

ered unstable over time. The MQ was administered twice to verify the impact of psychological distress on patients' perceptions of satisfaction at T-1 and T-2. The MCSD scale was only administered once at T-2 since SD is an attribute considered stable over time and not expected to vary during a period of 15 days.

Data analysis

The mean, variance, minimum and maximum were calculated for each item. Principal component analysis (PCA) was performed to determine the presence of a factorial structure among the items of the SOPPCAS. Correlations were performed between major signifi-

cant variables and the SOPPCAS as well as between the SOPPCAS, the MQ and the MCS D scale. We used Cronbach's Alpha to estimate the internal consistency of the SOPPCAS. Data analysis was performed with the SAS release 6.12 software (SAS Institute, Cary, North Carolina, USA).

Results

a) Characteristics of the sample

A total of 179 patients were approached. Of this number, 170 patients answered the SOPPCAS and MQ at T-1. The reasons mentioned by the patients who refused to answer the SOPPCAS ($n=9$) were: fatigue, lack of interest, and feeling of being emotionally disturbed by their experience with heart surgery. We obtained a return rate of 78% (133 respondents) at T-2. Close to 22% of the respondents did not remember meeting the anesthesiologist before their surgery nor could they distinguish between the anesthesiologist and other doctors they met while they were in the hospital.

The mean age of patients was 62.8 ± 11.3 yr (95% CI, 61.11–64.52; Min: 23; Max: 81) with a majority of men (68.2%). The predominant level of education was high school for 47.1% of the sample. For 22.4% of the patients, this was their first surgical experience and, for 85.9% of them, their first heart operation. Half of the respondents (50%) would have appreciated a postoperative visit by the anesthesiologist who took care of them in the operating room. Table I presents the major postoperative complaints expressed by patients. Most frequent postoperative problems were: nausea and vomiting, pain, sleep disorders and voice hoarseness. One patient reported awareness during surgery (0.6%) while five (2.9%) reported intraoperative dreaming. Finally, 32.9% of the respondents reported hallucinations and 30.0% experienced nightmares during the first two to three days after surgery.

b) Psychometric results of the SOPPCAS

Cronbach's Alpha for internal consistency of the SOPPCAS was 0.58. Factor rotation (varimax) determined the existence of four perioperative factors (Table II): 1) patient/anesthesiologist interactions; 2) preoccupations related to anesthesia; 3) experience with anesthesia; 4) pain management. Table II shows the distribution of the items according to each factor as well as the value of Cronbach's Alpha and percentage of variance explained by each factor. Total variance explained by the four perioperative factors was 55.94%. Item 12 displayed the weakest distinction in the distribution of the items among the four factors and, consequently, was removed.

c) Results on satisfaction

Table III presents the mean score obtained for each question and reversed question and also the global score of the SOPPCAS at T-1. The mean global satisfaction score averaged 4.45 ± 0.64 (95% CI, 4.36–4.55; Min: 2.82, Max: 5.80 on a possible maximum of 6.0). A mean of 4.39 ± 0.73 (95% CI, 4.26–4.51; Min: 2.23; Max: 5.93) was obtained at T-2. Main items related to satisfaction (represented arbitrarily by scores over 50% for combination of positive responses 4, 5, 6 or 1, 2, 3 for reversed questions) were: satisfaction with premedication (95.8%), feeling of empathy from the anesthesiologist (92.1%), reassurance from the anesthesiologist (90.8%), pain management (86.5%), clarity of information provided by anesthesiologist (86.4%), sufficient information related to anesthesia (83.2%), sufficient information related to the side effects of the anesthetics (63%). Items related to dissatisfaction (represented arbitrarily by scores over 50% for combination of negative responses 1, 2, 3 or 4, 5, 6 for reversed questions) were: lack of information on risks related to blood transfusion (71.5%) and recall of endotracheal intubation (50.8%).

Results at T-2 were comparable to T-1, with four exceptions. Respondents felt less reassured by the anesthesiologists regarding their anesthesia (4.52 ± 1.48), and thought that the information given by the anesthesiologists was less clear (4.72 ± 1.32). Remembrance of the endotracheal tube was less vivid (3.48 ± 2.16) and patients believed that their pain management had been less effective (4.92 ± 1.19) at T-2.

Overall, men (4.53 ± 0.59) and women (4.29 ± 0.73) were equally satisfied ($P < 0.05$). Yet, men (5.14 ± 1.00 , $P=0.0002$) and women (4.45 ± 1.34 , $P=0.001$) differed regarding preoccupations related to anesthesia (factor 2; $P=0.0002$) at T-1.

At T-1, other variables correlated significantly with the mean global score or with the perioperative factors of the SOPPCAS. Thus, age correlated with preoccupations related to anesthesia, (factor 2; $r=0.16$, $P=0.04$) and patient/anesthesiologist interactions (factor 1; $r=-0.23$, $P=0.003$). Global satisfaction with anesthesia services correlated significantly with the number of postoperative problems ($r=-0.19$, $P=0.02$), and pain management (factor 4; $r=0.36$, $P=0.0001$).

d) SD and psychological distress

Global mean score of this group of respondents to the MCS D scale was 14.24 ± 3.16 (95% CI, 13.69–14.80, Min: 5; Max: 20). 11.8% of respondents obtained a score of 10 or less, indicative of a weak influence of SD. SD was correlated with psychological distress ($r=-0.34$, $P=0.0005$) and preoccupations with anesthesia (factor 2; $r=0.18$, $P=0.04$). Questions of the SOPPCAS were

not correlated with the MCSD scale (r values below 0.13 with P -values above 0.05), indicating that the SOPPCAS measures elements unrelated to SD.

At T1, respondents obtained a mean psychological distress score of 0.55 ± 0.64 (95% CI, 0.44–0.62, Min: 0; Max 4.0) and a mean of 0.99 ± 0.84 (95% CI, 0.84–1.13, Min: 0; Max: 3.78) at T-2. Psychological distress correlated with: number of postoperative problems (physical and psychological problems; $r=0.24$, $P=0.005$) and global satisfaction with anesthesia services ($r=-0.25$, $P=0.004$).

e) Open-ended questions

Following is a summary of the main results obtained for each of the open-ended questions of the SOPPCAS. Respondents recalled principally the environment of the operating room (39.9%) or leaving their room (26.6%). Fourteen percent did not appreciate being conscious of the operating room just before surgery. Most of the respondents (46.1%) remembered the voice of a nurse telling them that the surgery was over. Others recalled the tube in their throat (13.3%) or a family member standing at their bedside and talking to them (12.6%).

A majority of patients (56.5%) mentioned that they were very satisfied by the care they received from the anesthesiologist. But, for close to 37% of the respondents, the most painful recollection of their experience was the presence of the endotracheal tube and the related pain. Several patients (28%) mentioned that they had to wait more than an hour, awake, alert, intubated and not allowed to receive sedation (for fear of retarding extubation), until the anesthesiologist visited them.

Discussion

Overall, the level of patient satisfaction regarding anesthesia services was moderately high (4.45/6.0). Others have reported much higher levels of patient satisfaction with anesthesia services.^{8,10,16–27} Such high levels have been postulated to reflect the patients' absence of concern on this issue¹⁹ or the use of improper methodology to measure patient satisfaction.²⁸ Our results would tend to show that patients do care about the quality of the services provided by anesthesiologists and that the latter explanation (improper methodology) may be more likely.

To our knowledge, no previous study had attempted to measure correlations between the questionnaire used to measure satisfaction and SD, a variable which could, theoretically at least, strongly influence patients' responses.^{29,30} Our group of patients scored moderately high (14/20) on the MCSD scale, indicating that they were, to some extent, eager to please the interviewer, despite

all the precautions taken to allow them to respond freely. Originally, we had hoped to be able to minimize the effect of SD by eliminating all respondents scoring over 10.0 on the MCSD scale. Obviously, we could not proceed accordingly since only 11.8% of the respondents obtained a low SD score. In such cases, Norman and Streiner³⁰ recommend that caution be exercised when interpreting the overall result on mean satisfaction.

A more detailed analysis of the results shows that the items of the SOPPCAS were not related to SD ($r < 0.13$), indicating that the validity of the questionnaire was not affected. Rather, SD should be viewed as an inherent characteristic of a majority of patients, a characteristic that tends to shift their responses towards more favourable scores in general.

Patients were satisfied with their interactions with the anesthesiologist, the content and amount of information given, the reassurance offered by the anesthesiologist and the management of their pain. Moreover, half of the respondents expressed a need to meet with the anesthesiologist after the operation, an infrequent occurrence in this institution and definitely an area for improvement. Postoperative visits give the anesthesiologist an opportunity to answer questions, seek evidence for injuries or complications related to anesthesia, and document completion of care.³¹

Overall, men are more satisfied with anesthesia services than women, a finding consistent with the literature. This may also be interpreted as a gender bias in response style, i.e., men have a lesser tendency to express emotion, dissatisfaction, etc.^{32–36}

Contrary to the general literature on satisfaction, our results show that older patients seem to report less satisfaction than younger ones with respect to their interactions with anesthesiologists. Young people, usually under 50 yr of age, are found to be more critical of the care they receive.^{2,37} They are usually more educated and more aware of the standards of care they should receive. Apparently this was not the case in the present sample. A possible explanation is that older patients do not verbalize their dissatisfaction, being afraid to bother their care providers with questions or that they do not need the same type of information than younger people. The SOPPCAS, by allowing them to express themselves more easily, was able to reveal their lack of satisfaction with anesthesia services. Anesthesiologists should be aware of such issues related to age, gender, etc., when performing their preoperative evaluation, in order to allow them to personalize their interview.

Postoperatively, respondents were concerned mainly about the endotracheal tube and the resulting pain and discomfort. Currently, patients having cardiac

surgery are most often extubated eight to 12 hr post-operatively, depending on their condition. Despite the ever-shortening time period between the end of surgery and extubation, the discomfort related to the endotracheal tube remains a serious concern. Similar concerns were also reported in another study³⁸ in which 101 respondents rated the gagging on the endotracheal tube as the second most undesirable outcome after vomiting. Such problems can be avoided or prevented by adequate sedation³⁹ and/or rapid intervention by the anesthesiologist when required.

Besides proposing elements to improve anesthesia patient care, the SOPPCAS will, implicitly, promote public recognition of anesthesiologists. Close to 22% of the respondents did not remember meeting the anesthesiologist before their surgery. As mentioned in a recent publication:³¹ "anesthesiologist-patient communication must span many gaps. It is tempting to discount communication if keeping patients alive and waking them up again are the only professional goals. Because anesthesiologist' interactions with conscious, verbal patients are within compressed time frames and narrow clinical conditions, clear, succinct, respectful communication is essential. Facility with a variety of communication skills signifies highly developed professionalism. Conversely, poor communication skills may increase litigious actions and malpractice suits."⁴⁰ Further, patient satisfaction is also dependent on the anesthesiologist designing an anesthesia regimen that closely fits the patient's preference as identified during the preanesthesia assessment visit.³⁸

Psychometric characteristics

Our results explain some of the relationships between the variables suggested in the conceptual framework (Figure 1) and patient satisfaction. Nevertheless, since correlations (r) between the main variables are weak (despite being significant), we are cautious not to imply that the variables presented in the framework are the only ones explaining patient's perceptions of anesthesia services.

The internal consistency of the global score of the SOPPCAS is low. This can be explained by the distinctive difference between the four perioperative factors of the SOPPCAS. Items distributed themselves among the four factors with the exception of item 12. It will be removed in the next version of the SOPPCAS. The four factors obtained acceptable Alpha's (close to 0.70)³⁰ with the exception of the fourth factor (pain management). This result is probably related to the presence of only two items associated to this factor, thus generating less variance and the dependency of one of the items (16) over the previous item (15). We decided not to remove

the factor (and both items) since it covered what we felt to be an important aspect of anesthesiology care. Further, we would like to mention a measurement issue that was overlooked in the calculation of the global score of the SOPPCAS. The weight attributed to questions 11 and 16 should not have been the same as for the other 15 Likert questions of the SOPPCAS since both questions are dependent on the answers provided on the preceding question respectively, thus question 10 and question 15. For instance, if a patient answers (1=not at all) at question 10 ("do you remember having a tube down your throat"), then question 11 ("was the tube in your throat a painful experience") becomes irrelevant in a measurement perspective. The same applies for questions 15 and 16. Therefore, since we consider that the information generated by both questions (11 and 16) are essential, we recommend to keep both questions in the SOPPCAS but to remove them in the calculation of the global score and factor analysis of the SOPPCAS. The results obtained with questions 11 and 16 should be presented apart from the other Likert questions.

In another order of ideas, it is important to specify that this is the SOPPCAS' first trial and that the results were obtained on a homogenous sample of postoperative cardiac surgery patients. Data collected from our patients relate to their experience with a major surgical intervention requiring intensive care postoperatively. These results cannot be generalized to the broad population of postoperative patients. More studies are needed to confirm or invalidate the relationships between the variables presented in the conceptual framework (Figure 1) since the four perioperative factors of the SOPPCAS explained only 56% of the total variance on satisfaction. Yet, this result does not come as a surprise: the SOPPCAS is a novel instrument, the data was collected on an homogenous sample and, above all, research on the concept of "satisfaction with anesthesia services" is still in its infancy.

Conclusion

Efforts were made to develop, using a rigorous method, a new instrument to measure patients' perceptions of the quality of cardiac anesthesia services. This instrument requires further studies of its reliability and validity. Even though this was the first trial of the SOPPCAS, we believe it is a step towards a more objective evaluation of patients' perceptions. Indeed, the instrument contains items closely related to a patient's experience with anesthesia, as opposed to methods designed to evaluate more medical or technical aspects of anesthesia care. To measure perceptions, an instrument must combine both multiple choice and open-ended questions. Comments from patients offer

the opportunity to explore beyond the official structure of the study and open pathways left unexplored by the objective data. Ultimately, the SOPPCAS may allow anesthesiologists to obtain useful feedback from their patients, improve the quality of the care they provide and, possibly raise their public profile within the healthcare system.

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References

- 1 Carr-Hill RA The measurement of patient satisfaction. *J Publ Health Med* 1992; 14: 236-49.
- 2 Linder-Pelz S. Toward a theory of patient satisfaction. *Soc Sci Med* 1982; 16: 577-82.
- 3 Locker D, Dunt D Theoretical and methodological issues in sociological studies of consumer satisfaction with medical care. *Soc Sci Med* 1978; 12: 283-92.
- 4 Omachonu VK. Quality of care and the patient: new criteria for evaluation. *Health Care Manag Rev* 1990; 15: 43-50.
- 5 Akinsaya J, Cox G, Crouch C, Fletcher L. The Roy adaptation: model in action. In: Price B (Ed.). *Nursing Models in Action*. London, UK: The Macmillan Press Ltd., 1994.
- 6 Iezzoni LI. Risk Adjustment for Measuring Health Care Outcomes. Ann Arbor, Michigan: Health Administration Press, 1994.
- 7 Lee A, Lum ME. Measuring anaesthetic outcomes. *Anaesth Intensive Care* 1996; 24: 685-93.
- 8 Whitty PM, Shaw IH, Goodwin DR Patient satisfaction with general anaesthesia. Too difficult to measure? *Anaesthesia* 1996; 51: 327-32.
- 9 Le May S, Hardy J-F, Taillefer M-C, Dupuis G Patient satisfaction with anesthesia services. *Can J Anesth* 2001; 48: 153-61.
- 10 Pestey ME. Patient satisfaction with the anesthesia services delivered in the cost containment atmosphere of healthcare today. Unpublished master thesis. New Haven, Connecticut: Southern Connecticut State University, 1992.
- 11 Strasser S, Davis RM. Measuring patient satisfaction for improved patient services. Ann Arbor, Michigan: Health Administration Press, 1991.
- 12 Strahan R, Gerbasi KC Short, homogenous versions of the Marlow-Crowne social desirability scale. *J Clin Psychology* 1972; 28: 191-3.
- 13 Cloutier J. La désirabilité sociale chez les agresseurs sexuels. Mémoire de maîtrise inédit en psychologie. Faculté des Arts et Sciences, Université de Montréal, 1993.
- 14 Ilfeld FW Jr. Further validation of a psychiatric symptom index in a normal population. *Psychological Reports* 1976; 39: 1215-28.
- 15 Bibeau L. Prevalence and associations of body image disorder perfectionism and suicidal ideation in a student population. Unpublished doctoral thesis in psychology, Université du Québec à Montréal, 1998.
- 16 Brown DL, Warner ME, Schroeder DR, Offord KP. Effect of intraoperative anesthetic events on postoperative patient satisfaction. *Mayo Clin Proc* 1997; 72: 20-5.
- 17 Preble LM, Perlstein L, Katsoff-Seidman L, O'Connor TZ, Barash PG. The patient care evaluation system: patients' perceptions of anesthetic care. *Connecticut Med* 1993; 57: 363-6.
- 18 Zvara DA, Nelson JM, Brooker RF, et al. The importance of the postoperative anesthetic visit: do repeated visits improve patient satisfaction or physician recognition? *Anesth Analg* 1996; 83: 793-7.
- 19 Keep PJ, Jenkins JR From the other end of the needle. The patient's experience of routine anaesthesia. *Anaesthesia* 1978; 33: 830-2.
- 20 Tong D, Chung F, Wong D. Predictive factors in global and anesthesia satisfaction in ambulatory surgical patients. *Anesthesiology* 1997; 87: 856-64.
- 21 Dexter F, Aker J, Wright WA Development of a measure of patient satisfaction with monitored anesthesia care. *Anesthesiology* 1997; 87: 865-73.
- 22 Penon C, Ecoffey C Evaluation par les patients de la qualité de la prise en charge anesthésique. *Ann Fr Anesth Réanim* 1995; 14: 374-5.
- 23 Burrow BJ. The patient's view of anaesthesia in an Australian teaching hospital. *Anaesth Intensive Care* 1982; 10: 20-4.
- 24 Dodds CP, Harding MI, More DG Anaesthesia in an Australian private hospital: the consumer's view. *Anaesth Intensive Care* 1985; 13: 325-9.
- 25 Shevde K, Panagopoulos G A survey of 800 patients' knowledge, attitudes, and concerns regarding anesthesia. *Anesth Analg* 1991; 73: 190-8.
- 26 Fleisher LA, Mark L, Lam J, et al. Disseminating information using an anesthesiology consultant report: impact on patient perceptions of quality of care. *J Clin Anesth* 1999; 11: 380-5.
- 27 Myles PS, Williams DL, Hendrata M, Anderson H, Weeks AM. Patient satisfaction after anaesthesia and surgery: results of a prospective survey of 10 811 patients. *Br J Anaesth* 2000; 84: 6-10.

- 28 *Le May S, Hardy J-F, Taillefer M-C, Dupuis G* Inappropriate methods for patient satisfaction (Letter). *Br J Anaesth* 2000; 84: 821.
- 29 *DeVellis RF* Scale Development. Theory and Applications. London, UK: Sage Publications, 1991.
- 30 *Streiner DL, Norman GR* Health Measurement Scales. A Practical Guide to Their Development and Use, 2nd ed., Oxford: Oxford University Press, 1995.
- 31 *Kopp VJ, Shafer A* Anesthesiologists and perioperative communication. *Anesthesiology* 2000; 93: 548–55.
- 32 *Lips HM* Sex and Gender. An Introduction, 2nd ed., Mountain View, CA: Mayfield Publishing Company, 1997.
- 33 *Nathanson CA* Illness and the feminine role: a theoretical review. *Soc Sci Med* 1975; 9: 57–62.
- 34 *Kandrack M-A, Grant KR, Segall A* Gender differences in health related behaviour: some unanswered questions. *Soc Sci Med* 1991; 32: 579–90.
- 35 *Kring AM, Gordon AH* Sex differences in emotion: expression, experience, and physiology. *J Pers Soc Psych* 1998; 74: 686–703.
- 36 *Gross JJ, John OP* Mapping the domain of expressivity: multimethod evidence for a hierarchical model. *J Pers Soc Psychol* 1998; 74: 170–91.
- 37 *Williams B* Patient satisfaction: a valid concept? *Soc Sci Med* 1994; 38: 509–16.
- 38 *Macario A, Weinger M, Carney S, Kim A* Which clinical anesthesia outcomes are important to avoid? The perspective of patients. *Anesth Analg* 1999; 89: 652–8.
- 39 *Powers J* A sedation protocol for preventing patient self-extubation. *Dimens Crit Care Nurs* 1999; 18: 30–4.
- 40 *Lester GW, Smith SG* Listening and talking to patients. A remedy for malpractice suits? *Western J Med* 1993; 158: 268–72.

Appendix

Scale Of Patients' Perceptions of Cardiac Anesthesia Services (SOPPCAS)

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N.B. The Anesthesiologist is the medical doctor who made you fall asleep for your operation.

Do you remember meeting the anesthesiologist before your operation ?

Yes ☐ No ☐

For each question, it is very important that you answer exactly what you think or what you have experienced, whether you are very satisfied or very dissatisfied regarding the services provided by the anesthesiologist. Your answers are essential to the improvement of the quality of services.

Would you please answer the following questions by circling the number that corresponds best to your response, from 1 (Not at all) to 6 (Very much).

I - Questions related to the period preceding the operation

1) Before your operation, did the anesthesiologist provide some information regarding your anesthesia ?

Not at all	Very much	Not applicable
1	2	3
4	5	6
		☐

2) Did you receive some information on the side effects related to the anesthesia ?

Not at all	Very much	Not applicable
1	2	3
4	5	6
		☐

3) Did the anesthesiologist reassure you regarding your anesthesia ?

Not at all	Very much	Not applicable
1	2	3
4	5	6
		☐

4) Before the operation, were you afraid to feel pain after the operation ?

Not at all	Very much	Not applicable
1	2	3
4	5	6
		☐

6) Did you feel that the anesthesiologist paid attention to your questions and comments ?

Not at all					Very much	Not applicable
1	2	3	4	5	6	☐

6) Before the operation, was the information given by the anesthesiologist clear ?

Not at all					Very much	Not applicable
1	2	3	4	5	6	☐

7) Before the operation, did you get any information regarding the risks related to blood transfusion ?

Not at all					Very much	Not applicable
1	2	3	4	5	6	☐

8) Did the medication you received before leaving your room for the operating room make you feel relaxed ?

Not at all					Very much	Not applicable
1	2	3	4	5	6	☐

8- Questions related to the period following the operation

9) Were you afraid to fall asleep and not wake up ?

Not at all					Very much
1	2	3	4	5	6

10) Do you remember having a tube down your throat after the operation ?

Not at all					Very much
1	2	3	4	5	6

11) Was the tube in your throat a painful experience ?

Not at all					Very much
1	2	3	4	5	6

12) Did you have any nightmares after the operation ?

13) Were you afraid of dying ?

14) Were you afraid of waking up during the operation ?

15) Did you suffer from pain after the operation ?

16) Was your pain well relieved ?

17) Do you remember entering the operating room ?

II- General questions related to your experience of anesthesia and surgery

1) What is your age ? _____

2) What is your sex ? _____

3) What is your level of education ?

primary school

☐ high school

☐

college

☐ university

☐

4) Is it your first operation ?

Yes ☐ No ☐

5) Is it your first heart operation ?

Yes ☐ No ☐

6) Did you feel that you received too much information regarding your operation ?

Yes ☐ No ☐

7) Would you have appreciated a visit by the anesthesiologist after the operation ?

Yes ☐ No ☐

8) What is the last thing that you remember before falling asleep for your operation ?

9) What is the first thing that you remember when you woke up after the operation ?

10) Do you remember being conscious between the moment you fell asleep and your awakening from the operation ? Yes ☐ No ☐

If you answered Yes, we would be interested to know if you were conscious of:

a) noises from instruments and machines Yes ☐ No ☐

b) pain Yes ☐ No ☐

c) voices Yes ☐ No ☐

d) feeling awake Yes ☐ No ☐

e) other (please specify) : _____

11) Did you dream during the operation ? Yes ☐ No ☐

If yes, could you describe what you have dreamed ?

12) Please indicate if you have experienced any of the following problems after the operation:

- a) Nausea** _____
- b) Vomiting** _____
- c) Numbness** _____
- d) Problems with your sleep** _____
- e) Pain** _____ **Location of the pain** _____
- f) Headaches** _____
- g) Sore throat** _____
- h) Difficulty to speak** _____
- i) Eyes problems** _____
- j) Hearing problems** _____
- k) Visions, hallucinations** _____
- l) Memory loss** _____
- m) Other Problems** _____ **Please specify** _____

13) Please let us know of any additional comments you would like to make regarding your overall experience of anesthesia and surgery.

Your comments are very important. They are essential to the improvement of the quality of services offered by the department of anesthesiology.

14) Concerning your hospitalisation, please indicate your level of general satisfaction regarding the services offered by the following persons: (Please circle your answer).

	Very unsatisfied	Unsatisfied	Satisfied	Very satisfied
a) Anesthesiologist	1	2	3	4
b) Nurses	1	2	3	4
c) Surgeon	1	2	3	4
d) Physiotherapists	1	2	3	4