Does a postoperative visit increase patient satisfaction with anaesthesia care?†

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Editor’s key points
- Dedicated personal care including postoperative visits enhances patient satisfaction with anaesthesia care.
- A single postoperative visit by the attending anaesthetist significantly increased the perception of ‘Continuity of personal care by the anaesthetist’ when compared with no visit at all.
- When compared with a visit by a nurse anaesthetist, there was no significant difference.
- However, patients were dissatisfied with a nurse performing the postoperative visit when expecting a physician.

Background. ‘Continuity of personal care by anaesthetist’, as defined by a single anaesthetist providing preoperative evaluation, performing anaesthesia, and delivering a postoperative visit to the patient, has been shown to be a major factor for patient satisfaction with anaesthesia care. This prospective randomized study investigated whether a single postoperative visit increased the patient’s perception of ‘Continuity of personal care by anaesthetist’ and hence satisfaction.

Methods. In Group 1, the same anaesthetist who conducted anaesthesia visited the patient on the first postoperative day. In Group 2, a nurse anaesthetist who did not participate in anaesthesia delivery made a postoperative visit to the patient. Patients in Group 3 were not visited. Patients received a previously validated questionnaire after discharge from hospital.

Results. The negative patient response created by the perception of not being visited after operation by the attending anaesthetist was 13.5% (95% CI ± 6.9), 69.2% (95% CI ± 10.3), and 77.1% (95% CI ± 9.1) in Groups 1, 2, and 3, respectively, with 1 vs 2 and 1 vs 3 (P<0.001) being significantly different. The negative patient response for ‘Continuity of personal care by anaesthetist’ was 40.0% (95% CI ± 5.3), 48.8% (95% CI ± 5.6), and 55.5% (95% CI ± 5.3) in Groups 1, 2, and 3, respectively, with 1 vs 3 (P<0.001) being significantly different.

Conclusions. Perception of the anaesthetist and satisfaction with ‘Continuity of personal care by anaesthetist’ were significantly increased by the introduction of a single postoperative visit by the anaesthetist compared with no visit at all. Overall satisfaction with anaesthesia was unchanged.

Keywords: outcome assessment (health care); patient satisfaction; perioperative care

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Methods

Ethical approval
The study was approved by the Institutional Review Board of our hospital. The requirement for written informed consent was waived, because the completion of the mailed-back questionnaire happened on a voluntary basis at home followed by an anonymous analysis.

Patient population
Participants were recruited at our tertiary hospital in Feldkirch (Fig. 1). Patient enrolment started in April 2008 and was completed the day each group comprised at least 200 participants, i.e. in June 2008. To meet eligibility criteria, patients had to be older than 16 yr and had to be undergoing elective surgery on an inpatient basis. They needed a reasonable knowledge of the German language and had to be residents of Austria. Patients were excluded if they required a postoperative anaesthetic follow-up visit for medical reasons or had specific complications related to anaesthesia on the first postoperative day. Likewise, patients with an ASA status of more than III were not entered into the study. Consecutive patients were screened for eligibility and then randomly assigned to three groups on the morning of the first postoperative day.

In Group 1, the same anaesthetist who conducted anaesthesia also visited the patient on the first postoperative day. In Group 2, a nurse anaesthetist who did not participate in the delivery of anaesthesia visited the patient. Patients in Group 3 served as a control group and did not receive a postoperative visit. Patients were not informed whether a postoperative visit was planned or not.

We did not address or influence preoperative evaluation of the patients we included in this study, which, in most cases, took place at our preoperative anaesthesia clinic.

Fig 1 Flow diagram presenting enrolment and intervention allocation of patients. *Owing to anaesthetic complications for follow-up (visit by attending anaesthetist compulsory).
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Instrument
The questionnaire had been psychometrically developed and positively tested for content validity and internal consistency when it was first used from 2000 to 2002. This meant that patient focus groups selected what they considered to be important. The resulting 55 questions covered all aspects of anaesthetic care. Out of the total of 55 questions, 29 questions were designed as problem questions. They were intended to create a rating by the interviewed patients. The other 26 questions asked for structural data about patient treatment within anaesthesia care. After factor and reliability analysis, all problem questions were grouped into six categories, also referred to as ‘Dimensions’: ‘Information/Involvement in decision-making’, ‘Respect/Confidence’, ‘Delays’, ‘Nursing care in recovery room’, ‘Continuity of personal care by anaesthetist’ (four questions; Table 1), and ‘Pain management’.

If a problem question was not answered 100% positively (‘Yes, totally’), but partially negatively (‘Yes, to some extent’) or entirely negatively, a deficit was stated. The sum of deficits in the problem questions led to a negative patient response score, the problem score, for one of the six dimensions. The mean of the problem scores for all 29 problem questions formed the ‘Total problem score’.

To shift the focus of this study to the postoperative visit, the original questionnaire as described above was slightly modified and supplemented in the dimension ‘Continuity of personal care by anaesthetist’: We changed the previous yes/no question ‘Did the anaesthetist visit you after operation?’ to ‘Who visited you after operation?’ This question additionally served to test whether the patient was able to identify the person who performed the postoperative visit, as correct identification is a prerequisite for perception of continuity.

Furthermore, we evaluated continuity of personal care by the anaesthetist in combination with the importance of a postoperative visit for the patient. We linked the answers to the newly included question ‘How important do you consider receiving a postoperative visit by the same anaesthetist who conducted your anaesthesia’ to the answers to ‘Who visited you after operation?’ It was defined as a problem if the patient considered continuity of personal care by the attending anaesthetist to be important, but was not visited by the same anaesthetist or did not recall having been visited. On the other hand, we stated no problem if the patient did not consider such a visit to be important and nobody visited.

Data handling
Primary outcomes
We measured the ‘negative patient response’ also called the ‘problem score’ created by the perception of not being visited after operation by the attending anaesthetist and the effect of this problem score on the dimension ‘Continuity of personal care by anaesthetist’ and overall dissatisfaction with anaesthesia care, expressed as the ‘Total problem score’.

Secondary outcomes
We tested whether identification of the person who visited after operation was correct. We evaluated the importance of the postoperative visit from the patient’s retrospective view after discharge.

The results of the remaining five dimensions were also analysed as secondary outcomes.

Before allocating the patients to the three groups by means of randomization on the first postoperative morning, all the patients whose anaesthetist was not present on that day were excluded. Hence, there were no skewed distributions due to missing patients from Group 1. In order to ensure that a follow-up visit was actually performed and of comparable quality, anaesthesia staff was required to fill in and return a form with patient answers to standardized questions about possible postoperative complaints.

A questionnaire was mailed to all patients within 2 weeks of discharge. One reminder was sent if the questionnaire was not returned for analysis within 3 weeks. When sending out the questionnaire, a prepaid return envelope was enclosed with a running number. This was matched with both the socio-demographic characteristics and the group to which each patient belonged. The questionnaires were returned for analysis to the statistical institute. The statistical institute only received the list with the socio-demographic/medical data which were found to be relevant confounders in 2002: subjective health status, age, type of insurance, length of hospital stay, gender, educational level, surgical clinic, ASA status, and consenting in ambulatory or ward setting.

Statistics
We defined that a decrease in the problem rating for ‘Continuity of personal care by anaesthetist’ by at least 15% in one group compared with the other two groups would be clinically relevant. This could be shown with an α of <0.05 (two-sided) and a power of >0.8 if the groups counted 3 × 100 participants. Assuming a response rate of >50%, we determined a group size of 200 patients per group to be enrolled. Cut-off was when each group had reached at least 200 patients. Randomization ensued with block lengths of 30 patients (3 × 10). For the generation of the blocks, ‘Research Randomizer’ (www.random.org) was used.

Table 1 Four questions that constitute the dimension ‘Continuity of personal care by anaesthetist’

| (1) Have you been informed by an anaesthetist about your forthcoming anaesthesia? |
| (2) Did you know which anaesthetist would conduct your anaesthesia? |
| (3) Did the same anaesthetist who informed you conduct your anaesthesia? |
| (4) Who visited you after operation? |

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In a first step, ANOVA and multiple comparisons of means (Scheffé test) were applied to analyse the interrelation of group membership (Groups 1–3) or socio-demographic/medical parameters (age, gender, ASA, etc.) and the primary and secondary outcomes. In a second step, a multivariate linear regression model was built entering all parameters with \( P < 0.20 \) on a bivariate level and reducing it to a parsimonious model with significant parameters only in a stepwise procedure. The predictor ‘group for follow-up visit’ (Groups 1–3) was treated as the forced entry. A value of \( P < 0.05 \) (two-tailed) was fixed as the threshold. SPSS 15 (SPSS Inc., Chicago, IL, USA) was used for all analyses.

Results

Six hundred and forty-two questionnaires were sent out. Groups 1, 2, and 3 comprised 207, 203, and 232 patients, respectively. Only three returned questionnaires had to be excluded (two doubles, one not filled in at all). Response rates in Groups 1, 2, and 3 were 60% (124 questionnaires), 64% (130 questionnaires), and 59% (137 questionnaires), respectively, and showed no significant difference between groups.

The median age of all participants was 55 yr. Women constituted 51% and men 48% of the study participants (1% did not comment).

The socio-demographic and medical characteristics were not significantly different between groups.

Primary outcome parameters

The negative patient response or problem score created by the perception of not being visited after operation by the attending anaesthetist was 13.5% (95% CI \( ± 6.9 \)), 69.2% (95% CI \( ± 10.3 \)), and 77.1% (95% CI \( ± 9.1 \)) in Groups 1, 2, and 3, respectively, with 1 vs 2 (\( P < 0.001 \)) and 1 vs 3 (\( P < 0.001 \)) being significantly different. The problem score for the dimension ‘Continuity of personal care by anaesthetist’ was 40.0% (95% CI \( ± 5.3 \)), 48.8% (95% CI \( ± 5.6 \)), and 55.5% (95% CI \( ± 5.3 \)) in Groups 1, 2, and 3, respectively, with 1 vs 3 (\( P < 0.001 \)) being significantly different. The ‘Total problem score’ as a measure of overall dissatisfaction with anaesthesia care did not differ significantly between groups (Fig. 2). The ‘Total problem score’ was affected by the confounders ASA status and education: patients with ASA status III reported 6.3% (95% CI \( ± 5.2 \)) more problems than those with ASA status I or II (\( P < 0.02 \)). The higher the education (university vs secondary education vs primary education), the higher was the reported problem score with +7.2% (95% CI \( ± 4.0 \)) for university vs secondary education (\( P < 0.001 \)) and +3.6% (95% CI \( ± 3.3 \)) for secondary vs primary education (\( P < 0.03 \)).

Secondary outcome parameters

The anaesthetist was much more often correctly identified than the nurse anaesthetist (Group 1 vs 2, \( P < 0.001 \); Fig. 3). The confounders ‘Setting of the preoperative consenting’ and ‘Gender’ influenced the problem score for not being visited as follows: an outpatient setting lowered the problem score in all groups by 13.8% (\( P < 0.01 \)) and being male lowered it by 10.5% (\( P < 0.01 \)).

Consideration of the importance of a postoperative visit by the attending anaesthetist reduced the problem score for not being visited to 8%, 28%, and 35% in Groups 1, 2, and 3, respectively, with 1 vs 2 (\( P < 0.01 \)) and 1 vs 3 (\( P < 0.001 \)) showing a significant difference (Table 2). Importance of a postoperative visit was significantly higher in Group 1 than in the other two groups (\( P < 0.001 \); Fig. 4).

In all other dimensions, there was no significant difference between the groups (Fig. 2).
Table 2  Primary outcome parameters. Data are presented as problem scores in %: If a problem question was not answered 100% positively ('Yes, totally'), but partially negatively ('Yes, to some extent') or entirely negatively, a deficit was stated. The sum of deficits in the problem questions led to a negative patient response score, the problem score. ‘Perception of not being visited’: problem score based on the question ‘Who visited you after operation?’. ‘Perception of not being visited after operation combined with importance of such a visit for the patient’: problem score based on questions ‘Who visited you after operation?’ and ‘How important do you consider receiving a postoperative visit by the same anaesthetist who conducted your anaesthesia?’ ‘Continuity of personal care by anaesthetist’ (problem score based on four questions; Table 1). Group 1, patients after operation visited by the anaesthetist who conducted anaesthesia; Group 2, patients after operation visited by a nurse anaesthetist not involved in anaesthesia; Group 3, patients not visited. **P < 0.001 vs Group 3. §§P < 0.001 vs Group 2. §P < 0.01 vs Group 2

![Bar chart](image1)

**Fig 3** Identification—Who of the anaesthetic team visited you after operation? Groups 1–3 are compared. Group 1 attending anaesthetist, Group 2 nurse anaesthetist, and Group 3 no visit. Values in per cent of all answered questions per group in the questionnaire.

![Bar chart](image2)

**Fig 4** Importance of the same anaesthetist performing the postoperative visit. Groups 1–3 are compared. Group 1 attending anaesthetist, Group 2 nurse anaesthetist, and Group 3 no visit. Values in per cent of all answered questions per group in the questionnaire.
Discussion

Our study showed that a single postoperative visit by the attending anaesthetist significantly increased the perception of ‘Continuity of personal care by the anaesthetist’ when compared with no visit at all. However, when compared with a visit by a nurse anaesthetist, there was no significant difference.

Dedicated personal care including postoperative visits has been shown to be one of the most important factors for patient satisfaction with anaesthesia care.1–3 In particular continuity of personal care by the anaesthetist, as defined by the presence of a single anaesthetist providing preoperative evaluation and informed consent, performing anaesthesia, and visiting the patient after operation, has been described as a crucial factor for patient satisfaction with anaesthesia care.2

In our study, we were interested to know to what extent a postoperative visit by the attending anaesthetist could make up for the deficit resulting from the disruption of personal care between preoperative evaluation and delivery of anaesthesia.

In our study, we could in fact demonstrate a huge improvement in the perception of a postoperative visit when we compared a visit by the attending anaesthetist to a visit by the nurse anaesthetist or no visit at all. However, this positive perception of a visit by the anaesthetist could not be translated into a comparable improvement in the perceived ‘Continuity of personal care by the anaesthetist’, which was not significantly better when compared with a visit by the nurse anaesthetist. This may be attributed to at least two mechanisms.

First, patients often find it very difficult to recognize the anaesthetist who performs a postoperative visit: only 67% of our patients were able to correctly recall the postoperative visit by their anaesthetist. Similar results were obtained by another study group who reported that only 10% of their patients were able to spontaneously recall the name of the anaesthetist who performed both anaesthesia and the postoperative visit.11 This percentage could not be improved by increasing the frequency of postoperative visits from one to three. In our study and also in our clinical routine, patients are assigned to anaesthetists and therefore do not know before operation who will perform anaesthesia. Patients first make contact with their anaesthetist directly before the operation, during a stressful period, often at a time when preoperative anxiolytic medications have already been administered. Thus, in sharp contrast to repeated patient contact with the surgeon at various stages of the procedure, the postoperative visit may be the first time that patients clearly visualize ‘their’ anaesthetist. Another study group showed that only two or more postoperative visits by an anaesthetist improved patient satisfaction.12 This is in line with other findings, which showed that prolonged patient contact is a significant predictor of patient satisfaction.13 Yet, another study group came up with contrasting results.11 This, however, may simply reflect differing types of study design and definitions of patient satisfaction.

Secondly, even if a postoperative visit by the anaesthetist takes place and is actually perceived as such by the patients, they may still judge such a visit as more or less important for their satisfaction. In the present updated questionnaire, we specifically addressed the importance of the postoperative visit for the patients. In Group 1, 22.5% of the patients felt that the postoperative visit of their anaesthetist was of little importance. Taking into consideration the importance, a patient attached to a postoperative visit by the attending anaesthetist even reduced the problem score for the perception of not being visited after operation when compared with not considering the perceived importance of such a visit. Still, Group 1 patients visited by the attending anaesthetist had significantly lower problem scores when compared with those visited by a nurse anaesthetist or those not visited at all. Thus, in general, patients appreciate a postoperative visit by their attending anaesthetist.

The importance of a postoperative visit may vary with the patient’s expectations. In our study, the group that rated importance of the postoperative visit by the attending anaesthetist highest was the one that actually received such a visit. Hence, fulfilled expectation is likely to have played a role in judging the importance of such a visit, which would explain the lower rates in Groups 2 and 3. Another study group who researched ‘continued’ (the anaesthetist who conducts the preoperative visit will also administer the anaesthetic) vs ‘divided’ (the anaesthetist who conducts the preoperative visit will not administer the anaesthetic) anaesthetic care observed a similar effect: when patients were informed during the preoperative visit that the anaesthetic would be administered by another anaesthetist, they attached significantly less importance to having the same anaesthetist conduct the preoperative visit and administer anaesthesia than another group of patients who were informed that the anaesthetic would be administered by the same anaesthetist.14 Patient satisfaction with anaesthetic care did not differ between the two groups. Thus, clear information about whether a postoperative visit will occur and by whom it will be performed may influence the importance of such a visit for the patient and, as a consequence, patient satisfaction.

Our study clearly shows that as long as the patient expects a physician, he or she will be dissatisfied with a nurse performing the postoperative visit.

A limitation of our study set-up is the fact that we relied on a mailed-back questionnaire and a relatively high number of patients (39%) failed to return the questionnaires. Still, using the current questionnaire, we were able to reproduce a very similar pattern of problem scores compared with our previous studies in different hospitals.7–9,10 Other forms of questioning such as personal interviews or in-hospital questionnaires result in higher response rates, but are subject to social desirability and interviewer bias.7 Another limitation is that we did not measure how often the anaesthetist who consented the patient actually conducted anaesthesia in each group. However, we assumed the rate to be quite low, because the average chance to meet a patient...
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twice in the process of anaesthetic care is only around 3% at our department.

Our study setting excluded patients with adverse events, as those were all followed-up closely. In these patients, true randomization with the option 'no postoperative visit' would not have been feasible.

In conclusion, a single postoperative visit by the anaesthetist is able to increase perceived 'Continuity of personal care by the anaesthetist' and hence satisfaction. However, there is no significant difference compared with a visit by a nurse anaesthetist.

Both moderate recognition rates of the anaesthetist and unclear patient expectations concerning the postoperative visit may limit the effect of such a visit on perceived continuity of care and patient satisfaction.

Future studies should address the issue whether perceived continuity of personal care for the patient, ideally represented by a single anaesthetist providing the entire anaesthetic care, could be replaced by anaesthetic team continuity. Both clear preoperative information of the patient about 'divided' anaesthetic care and strict attention to the patient's needs, as expressed before operation, throughout the process of anaesthetic care may help to reach this goal.

It is our clear understanding that in the case of adverse events occurring during anaesthesia care, intense personal attention is crucial for a satisfactory and trustful relationship between the patient and the physician. Future studies should also address the question whether patients who experienced an adverse event do specifically benefit and appreciate one or repeated postoperative visits by the attending anaesthetist.

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Conflict of interest

None declared.

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