Effect of timing on the response to postal questionnaires concerning satisfaction with anaesthesia care

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Background. There is little information on the effect of time on the assessment by the patient of quality of anaesthesia care. This study compared the patient's assessment of anaesthesia care after three different periods of time following discharge from hospital.

Materials. Three groups of patients were assigned to receive a standardized, validated psychometric questionnaire either 1, 5, or 9 weeks after discharge from hospital. We measured response rate and the total mean problem score of six dimensions.

Results. Groups 1, 2, and 3 received 748, 743, and 723 questionnaires, respectively. The response rates including one reminder were 67.3 (95% confidence interval [CI] 63.9–70.6%), 64.5% (CI 61.1–67.9%), and 58.9% (CI 55.5–62.4%), respectively (Group 1 vs Group 3, P < 0.001, and Group 2 vs Group 3, P < 0.05). The total mean problem scores were not significantly different with 17 (CI 1.4%), 17 (CI 1.4%), and 15% (CI 1.3%), respectively. In two out of six dimensions (‘Continuity of personal care by anaesthetist’ and ‘Nursing care in recovery room’) significantly less problems were reported after 9 weeks. The other dimensions of the questionnaire showed no consistent differences between groups.

Conclusions. The response rate is significantly lower at 9 weeks compared with 1 and 5 weeks after discharge. The total mean problem score remains unchanged but certain fields show fewer problems after 9 weeks compared with 1 and 5 weeks. Questionnaires on patient satisfaction with anaesthesia care should be sent within 5 weeks of discharge.

Keywords: anaesthesia, audit, mailed survey questionnaire; anaesthesia, quality management; patient satisfaction

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Patient satisfaction is a mainstay of quality of care.1–5 Health and patient satisfaction are the ultimate outcomes of quality of care. Questionnaires have been shown to be suitable for evaluation and comparison of patient satisfaction ratings.1,2,6–10 Psychometrically developed questionnaires on patient satisfaction with anaesthesia care are rare11 and require further refinement with regard to validity, reliability, and confounding variables.12

Little is known about the impact of different follow-up times.10,13

If regular reliable assessment of care is necessary, the hospital must send questionnaires to patients at defined intervals between discharge from hospital.13 However, instruments designed to check the quality of patient care are efficient if they are applied at the best time to survey patients, and at a time that elicits the highest response rate. We therefore evaluated the influence of time after discharge from hospital on response rate and patient satisfaction with anaesthesia care with a validated questionnaire.

Methods

Following approval by the St Gallen Cantonal Hospital Ethics Committee, all in-patients admitted for elective...
surgery over a 15-week period (January–May 2003) were assigned to one of three groups who were sent the questionnaire described below by post, either 1, 5, or 9 weeks after discharge. No day surgery patients were included as this only represented a small proportion of the whole population and we wanted to compare our results with the previous studies.

All patients were treated at St Gallen Cantonal Hospital, a tertiary-care institution and were more than 15 yr, undergoing elective surgery and to be discharged to their home. Patients also had to be resident in Switzerland.

The questionnaire used was developed by the Picker Institut in collaboration with six hospitals in Switzerland and Austria.11 It was used in pilot studies in April 2000, September 2000–January 2001 and in 2002.14 During these stages, it was validated and tested for reliability. The content of the questionnaire was developed by an expert team and four focus groups of patients led by a psychologist.

After factor and reliability analysis, the items were grouped into six dimensions: ‘Information/involvement in decision-making’, ‘Respect/confidence’, ‘Delays’, ‘Nursing care in recovery room’, ‘Continuity of personal care by anaesthetist’ and ‘Pain management’. The questionnaire contains 55 questions. Participants confirmed that it is easy to read and fill out.

The problem score for a single item is calculated as the percentage of persons stating a deficit for this particular aspect. The problem score of a dimension (group of items) is the proportion of problems mentioned for all relevant questions in the dimension concerned: 29 problem score questions are embedded in the questionnaire.

Analysis of the above studies showed that the dimensions ‘Information/involvement in decision-making’ and ‘Continuity of personal care by anaesthetist’ are the most important, with beta coefficients of 0.60 and 0.27, respectively.11 These dimensions consistently showed the highest problem scores in the surveys conducted between 2000 and 2003.11 14

Three different mailing intervals were to be compared. Based on the last study with this questionnaire in 2002 at St Gallen Cantonal Hospital, we expected a response rate of between 55 and 60%. The total problem score as a measure of dissatisfaction was 16%, with a 95% confidence interval (CI) of ±1. Accordingly, each group would require a minimum of 300 completed questionnaires to show differences of ±12% in response rate and ±3.5% in the total problem score with a power of at least 0.8. This would mean sending out about 600 questionnaires to each group to achieve the expected response. According to the admission rate at our hospital, we calculated that we would need 15 weeks to obtain the desired numbers.

We studied patients admitted for elective surgery in a 15-week period between January 31, 2003 and May 22, 2003. Allocation was adjusted to balance the groups and is explained below.

Patients were grouped week-wise (for practical reasons) with the following pattern.

In the first cycle, the questionnaire was sent to Group 3, 9 weeks after discharge (minimum 60 days, maximum 66 days), to Group 2, 5 weeks after discharge (minimum 32, maximum 38 days), and to Group 1, 1 week after discharge (minimum 4 days, maximum 10 days).

The groups changed weekly, under the assumption that the surgical programme across all specialities did not change significantly over the trial period. We also assumed that an interval of 3 weeks until repetition of the same group would not be influenced by seasonal or other changes. The cycle was repeated four times, and was designed to end with the last group being mailed 1 week after discharge to keep the mailing period for the whole study as short as possible. If no response from the patient was received after 2 weeks, a reminder containing an identical questionnaire (on yellow instead of white paper) was mailed once.

The questionnaires were sent out by St Gallen Cantonal Hospital using a mailing list of all enrolled patients. The questionnaires contained a follow-up number. They were accompanied by a covering letter, which explained the purpose of the study and assured anonymity. A prepaid envelope was provided for return of the completed questionnaire to the Picker Institut, who conducted the analysis.

Patients were not informed about the study while in hospital to exclude the bias of knowing ahead that they will be asked about their opinion later. We wanted patients to answer our questionnaire at a certain date to be able to discriminate between the different time intervals for the analysis.

The statistical analysis was conducted anonymously. The Picker Institut was supplied only with anonymous patient characteristics from the hospital, together with the follow-up number. The hospital was supplied only with the aggregated results of the statistical analysis without follow-up numbers, so that identification of patients was not possible. Besides descriptive techniques, the statistical analysis included analysis of variance (ANOVA) with one or more factors, multiple comparisons of means and multiple logistic regression analysis. SPSS 10 was used for all analyses.

Results

A total of 2214 questionnaires were sent over the 15-week study period. The patients were evenly distributed across the surgical specialities of our hospital (general surgery, orthopaedics, urology, ophthalmology, ear-nose-throat, neurosurgery, and gynaecology). Age, sex, type of anaesthesia, and ASA (American Society of Anaesthesiologists) classes I–IV were also evenly distributed (Table 1). Group 2 (5 weeks) contained slightly more privately insured patients. The median length of stay was 6 days with a range of 1–104 days but 98% of all patients stayed between 1 and 31 days in hospital. The groups did not differ significantly in this respect with a median stay of 6 days in Group 1, 7 days in Group 2, and 6 days in Group 3. 97.6, 97.6, and 98.7% stayed in hospital for the period of 1–31 days, respectively.

748, 743, and 723 questionnaires were sent out to Groups 1, 2, and 3, respectively. The response rate, including the
The dependent variable showed that the following were 75% each. This was also the case for state-insured patients as broken down to single days, the distribution is uneven. The (64%), 7–11 (67%), and more than 12 (64%). However, if responded less (59%) than patients who stayed longer: 4–6 groups. Generally patients with a stay of less than 3 days all three groups without significant differences between.

Duration of stay showed an even effect on response rate in confounding variables age, ASA class, and insurance status. There were significant, both before and adjustment for the reminder questionnaire and response was similar to that of the first mailing.

The total problem score was 17 (95% CI 1.4%), 17 (95% CI 1.4%), and 15% (95% CI 1.3%) for Groups 1, 2, and 3 respectively. There were no significant differences between groups as for the percentage answering after the first and the reminder questionnaire, with 72.7, 72.6, and 74% of Groups 1, 2, and 3 respectively, replying to the first questionnaire. The time pattern between mailing of the reminder questionnaire and response was similar to that of the first mailing.

Differences between the other dimensions were inconsistent and not significant.

### Discussion

The response rate in this patient sample was similar at 1 and 5 weeks but decreased by the ninth week. This pattern has not been reported elsewhere.10 13 15 16 The total mean problem score remained unchanged. A lower problem score in the fields ‘Continuity of personal care by anaesthetist’ and ‘Nursing care in recovery room’ after 9 weeks, can be interpreted as a less critical attitude. Ware18 also found less critical appraisal with time in his study of a general medical population. Other studies have found the opposite,3 13 17 19 and reported a more critical attitude, with less satisfaction, as time passes. Ley19 described a curvilinear relationship with higher satisfaction rates 1 and 8 weeks after discharge and a lower degree of satisfaction in the intervening period (2 and 4 weeks).

Once surgery is over, the emotional importance of the entire experience of hospitalization diminishes with time as daily life re-establishes itself, which could explain a less critical attitude.1 10 18 This may also result in the lower response rate we noted, which was also described by Freise.13

We appreciate that different settings could be the reason for contradictory results. In our interpretation, less emotional participation seems to be a major factor in response to questionnaires, which is reflected in our study, but further studies are needed. It is worth noting that the response rate in patients less than 30 yr was markedly lower as has been observed in other studies.20 21 The response from privately insured patients was significantly higher than from state-insured patients.

### Table 1 Characteristics of patients of the three groups in the study

<table>
<thead>
<tr>
<th>Variable/parameter</th>
<th>Group 1 (1 week)</th>
<th>Group 2 (5 weeks)</th>
<th>Group 3 (9 weeks)</th>
<th>Significant differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean (range)</td>
<td>53.4 (16–97)</td>
<td>53.6 (16–95)</td>
<td>52.8 (16–96)</td>
<td>NS</td>
</tr>
<tr>
<td>ASA category (%)</td>
<td>20.3</td>
<td>18.2</td>
<td>17.4</td>
<td>NS</td>
</tr>
<tr>
<td>Type of anaesthesia</td>
<td>79.0</td>
<td>78.2</td>
<td>78.2</td>
<td>NS</td>
</tr>
<tr>
<td>Type of insurance</td>
<td>27.8</td>
<td>31.9</td>
<td>27.7</td>
<td>NS</td>
</tr>
<tr>
<td>Sex (%) female</td>
<td>47.3</td>
<td>50.5</td>
<td>47.0</td>
<td>NS</td>
</tr>
<tr>
<td>Total questionnaires sent out (n=2214)</td>
<td>748</td>
<td>743</td>
<td>723</td>
<td></td>
</tr>
</tbody>
</table>

### Table 2 Response rate and patient characteristics

<table>
<thead>
<tr>
<th>Variable/parameter</th>
<th>Response rate % (questionnaires sent)</th>
<th>Significant differences (bivariate level)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age groups &lt;20</td>
<td>39 (89)</td>
<td>&lt;20 vs all other age groups: P&lt;0.05</td>
</tr>
<tr>
<td>20–29</td>
<td>49 (164)</td>
<td>20–29 vs all age groups from 30–39 to 70–79: P&lt;0.05</td>
</tr>
<tr>
<td>30–39</td>
<td>60 (275)</td>
<td></td>
</tr>
<tr>
<td>40–49</td>
<td>66 (389)</td>
<td></td>
</tr>
<tr>
<td>50–59</td>
<td>68 (415)</td>
<td></td>
</tr>
<tr>
<td>60–69</td>
<td>70 (413)</td>
<td></td>
</tr>
<tr>
<td>70–79</td>
<td>66 (326)</td>
<td></td>
</tr>
<tr>
<td>80–89</td>
<td>60 (114)</td>
<td></td>
</tr>
<tr>
<td>90+</td>
<td>63 (19)</td>
<td></td>
</tr>
<tr>
<td>Groups (time since discharge) 1 (1 week) Adjusted/raw data 67.3/66.9 (748) Adjusted for age, ASA and type of insurance/raw data CI adjusted 63.9–70.6 1 vs 3: P&lt;0.001/P&lt;0.001 CI raw data 61.8–68.7 CI raw data 58.9/58.5 (723) CI adjusted 55.5–62.4 CI raw data 55.0–62.0 1: P&lt;0.05/P&lt;0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 (5 weeks)</td>
<td>Adjusted/raw data 64.5/65.2 (743)</td>
<td>Adjusted for age, ASA and type of insurance/raw data CI adjusted 61.1–67.9 CI raw data 61.8–68.7 CI raw data 58.9/58.5 (723) CI adjusted 55.5–62.4 CI raw data 55.0–62.0 1: P&lt;0.05/P&lt;0.01</td>
</tr>
<tr>
<td>3 (9 weeks)</td>
<td>Adjusted/raw data 64.5/65.2 (743)</td>
<td>Adjusted for age, ASA and type of insurance/raw data CI adjusted 61.1–67.9 CI raw data 61.8–68.7 CI raw data 58.9/58.5 (723) CI adjusted 55.5–62.4 CI raw data 55.0–62.0 1: P&lt;0.05/P&lt;0.01</td>
</tr>
<tr>
<td>Total</td>
<td>64 (2204)</td>
<td></td>
</tr>
</tbody>
</table>
Whilst the response rate and description of certain problems in some areas were lower 9 weeks after discharge, the differences between 1 and 5 weeks were very small.

The importance of these results is that between 1 and 5 weeks there is no loss of critical appraisal and a consistent response rate. This greatly facilitates quality assurance by allowing group-mailings every 5 weeks instead of mailing on a daily basis while retaining reproducible and valid responses.

There are few systematic studies with validated instruments in quality management.21 Likewise, the time factor in surveys seems poorly assessed. We consider it an important step to prove with sufficient patient numbers and a valid instrument how timing of mailing questionnaires affects response.

We know from this and the previous surveys that ‘Information/involvement in decision-making’ and ‘Continuity of care by anaesthetist’ show the most important deficiencies.11 14 By improving them, an increase in general satisfaction with anaesthesia care should be feasible. A recent study showed that improving anaesthetists’ communication skills might increase patient satisfaction, although the questionnaire used had not been validated.22

Nevertheless, we think the use of a questionnaire helps to identify problems existing in anaesthesia care. Previous studies have shown that there are substantial differences between individual hospitals and this is reflected in the different patterns within the six fields of our questionnaire.11 14

Our response rates showed that about one third of patients did not respond after discharge, which is within the usual range with both recruitment and collection by mail.21 Ley reported that patients replying to postal questionnaires were not more likely to be satisfied than those who did not reply.19 However, another study suggested that patients who were more satisfied were less likely to respond.18 In a review of the subject, eight out of 14 studies reported no difference.21

As the majority of our non-respondents were younger patients, there might be a loss of critical appraisal, as is known from other studies.23

There is no strict correlation between contact with anaesthesia and the receipt of the questionnaire at home. However, mailed questionnaires are a well-established and widely applied technique. Patients were therefore under no obligation at all to respond to the questionnaire.

The median length of stay was 6 days. The quality of care should have been remembered fairly well until receipt of the questionnaire after discharge. The duration of stay was distributed evenly with no significant differences between the three groups but the influence of the duration of stay in hospital on response remains unknown for our population.

In conclusion, a good response to a questionnaire on satisfaction with anaesthesia care can be expected from in-patients with our population profile if the questionnaire is sent to them within 1–5 weeks following discharge from hospital. This suggests that group mailings of questionnaires from up to 5 weeks from discharge are possible without loss of response, which would facilitate quality assurance.

**Acknowledgements**

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