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SCIENTIFIC ARTICLE

The practice of postanesthesia visits – a questionnaire study



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KEYWORDS

Postanesthesia visit;
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Abstract

Background and objective: Regular postanesthesia visits allow the detection of anesthesia related complications and increase patient satisfaction. Consequently, the performance of postanesthesia visits has been recommended after certain types of anesthesia. However, no data is available concerning the current practice of postanesthesia visits. Therefore, this study was designed to investigate quantity, organization, contents, significance and problems of postanesthesia visits in Germany.

Methods: For this prospective closed-design survey, a questionnaire, consisting of 13 questions, was designed and tested for objectivity, reliability and validity. Subsequently, 3955 registered anesthesiologists were contacted via email to answer this survey.

Results: Return rate was 31.4%; 958 questionnaires were included in the study. Only a small portion of patients was estimated to receive a postanesthesia visit (median: 20.0%). In hospitals with a specific postanesthesia visit service, this number was significantly higher (median: 65.0%, $p < 0.001$) vs. no postanesthesia visit service. Postanesthesia visits usually lasted less than 5 minutes (60.0%), and were typically conducted on the day of surgery (48.0%), after regular working hours (55.0%). 38.0% of the respondents reported to detect perioperative complications intermittently during their visits. While 98.0% of all respondents believe that postanesthesia visits improve the quality of their own work, 86.0% of the participants complain a lack of time for this task.

Conclusions: Our survey indicates that current working conditions prevent a regular postanesthesia visit routine. Considering the high appreciation of postanesthesia visits by anesthesiologists, as well as the relevant incidence of postoperative complications detected during these visits, it seems desirable to consider organizational improvements for postanesthesia care.

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PALAVRAS-CHAVE

Visita pós-anestésica;
Anestesia;
Complicação;
Questionário

A prática de visitas pós-anestésicas – estudo de um questionário**Resumo**

Justificativa e objetivo: As visitas regulares pós-anestesia (VPA) permitem detectar complicações relacionadas à anestesia e aumentar a satisfação do paciente. Portanto, a realização de VPA foi recomendada após certos tipos de anestesia. Porém, não há dados disponíveis sobre a prática atual de VPA. Logo, este estudo foi projetado para investigar a quantidade, organização, conteúdo, significância e problemas da VPA na Alemanha.

Método: Para esta pesquisa de natureza fechada e prospectiva, um questionário com 13 perguntas foi criado e testado para identificar a objetividade, confiabilidade e validade. Posteriormente, 3.955 anesthesiologistas registrados foram contatados via e-mail para responder a essa pesquisa.

Resultados: A taxa de retorno foi de 31,4%; 958 questionários foram incluídos no estudo. Apenas uma pequena parte dos pacientes foi designada para receber uma VPA (mediana: 20,0%). Em hospitais com serviço específico de VPA, esse número foi significativamente maior (mediana: 65,0%, $p < 0,001$) vs. ausência de serviço de VPA. As VPA normalmente duraram menos de 5 minutos (60,0%) e foram tipicamente conduzidas no dia da cirurgia (48,0%), após o turno normal de trabalho (55,0%). Dentre os que responderam o questionário, 38,0% relataram detectar complicações perioperatórias de forma intermitente durante as visitas. Enquanto 98,0% dos entrevistados acreditam que as VPA melhoram a qualidade de seu próprio trabalho, 86,0% se queixam de falta de tempo para essa tarefa.

Conclusões: Nossa pesquisa indica que as condições atuais de trabalho impedem a realização rotineira de VPA. Considerando a alta valorização das VPA por anesthesiologistas, bem como a incidência relevante de complicações no pós-operatório detectadas durante essas visitas, parece desejável considerar melhorias organizacionais para a assistência após a anestesia.

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Introduction

The idea and relevance of postanesthesia visits (PAVs) was mentioned as early as 1934, with the recommendation that anesthesiologists should visit their patients regularly in the first two days after surgery to obtain information about the patient's condition.¹ Yet, in today's anesthesia textbooks, this element of perioperative care is mostly neglected.² While there is extensive literature on potential complications and side effects of general and regional anesthesia, the performance of a personal visit to detect such complications appears to be forgotten practice.

Only due to the currently increasing demand for quality management, the importance of PAVs has in part been revived.³ A small number of studies have demonstrated that the performance of PAVs may improve patient satisfaction⁴⁻⁶ and physician recognition.⁷ In an Indian study, patients who received a PAV were significantly more satisfied than those without a PAV.⁸ Similar results were obtained in an Austrian study, showing that a single PAV may significantly increase patient satisfaction.⁹ As the perfect time for PAVs, 12–24 h after anesthesia was suggested.¹⁰ Multiple questionnaires have been implemented to determine patient satisfaction postoperatively (Fig. 1).¹¹⁻¹³ However, 'receiving information' and 'feeling safe' appear to be strong predictors of patient satisfaction.¹⁴ Therefore, for the purpose of PAVs, face-to-face interviews may be more suitable than a questionnaire in determining patient satisfaction with

anesthesia.⁶ To improve perioperative quality control, the implementation of an interdisciplinary postanesthesia service was suggested.⁵

The German Society of Anaesthesiology and Intensive Care Medicine (DGAI) guidelines for regional anesthesia in obstetrics specifically require a postanesthesia visit within 24 h.¹⁵ For the recognition of intraoperative awareness, PAV questioning of the patient has been recommended.¹⁶ Further, DGAI guidelines for the collaboration between surgeons and anesthesiologists explicitly indicate that the anesthesiologist is responsible for the detection and treatment of anesthesia related complications.¹⁷⁻²⁰ Similar guidelines have been published internationally: The American Society of Anesthesiologists explicitly define postanesthetic evaluation and therapy as the responsibility of an anesthesiologist.²¹ The Royal College of Anaesthetists has published specific recommendations for post-anesthesia visits and defines patient groups that should be visited within 24 h.²² Although both surgeons and anesthesiologists are required to inform each other about complications that might be attributable to the other specialty,¹⁷⁻²⁰ it appears likely that certain anesthesia related complications – like sensory and motor deficiencies after regional anesthesia – may remain unnoticed by non-anesthesiologists.

Currently, it is unknown how many patients receive postanesthesia care by means of PAVs. No data is available whether PAVs are performed, documented or valued by anesthesiologists. To shed light on this issue, we contacted 3955

registered anesthesiologists and performed a survey consisting of 13 questions, evaluating quantity, organization, contents, significance and problems of postanesthesia visits.

Methods

Conception of the questionnaire

In accordance with German regulations, no ethical approval was necessary for this survey, as only anonymized data was collected (§15 MBO-Ä), and no patients were involved (non-AMG-non-MPG-study). The questionnaire was created with support of the Centre for Surveys, Opinions, and Analyses (ZUMA, Mannheim, Germany) (for a flowchart of the study process) (Fig. 2). Criteria of objectivity were met by using a closed multiple-choice design for the questionnaire, excluding the possibility of interpretational errors. The process of validation was performed in the Department of Anesthesiology, Saarland University Hospital, using a standardized model of cognitive pretesting. In total, 30 randomly chosen anesthesiologists were tested. In the final version of the questionnaire, no differences between the measure and the underlying construct were observed. Retest reliability was evaluated after validation of the questionnaire. Fifteen candidates that underwent the validation process were randomly chosen to complete the survey a second time after a waiting period of 10 days, without prior notice. The

Translated Questionnaire	
Please answer the following questions regarding your practice of post-anesthesia visits for elective, non-ICU patients:	
1. Please estimate the percentage of patients anesthetized in your hospital in the last year that are visited postoperatively by an anesthesiologist.	
0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100%	
There are generally no postanesthesia visits in our hospital.	
2. Is there a post-anesthesia service in your hospital that has the duty to perform postanesthesia visits?	
Yes	No
3. Which information about the post-anesthesia visit is recorded in the patient chart?	
Time	Contents
Duration	Documentation is not performed
4. Please estimate the percentage of patients anesthetized by yourself in the last year that have received a post-anesthesia-visit	
... by yourself	0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100%
... by a colleague	0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100%
5. When do you typically perform post-anesthesia visits?	
Within regular working hours	After regular working hours
6. How often have you performed anesthesia-visit typically within the last year?	
Daily	Every 2–3 days
Every 4–5 days	Less than once a week
Only when member of a post-anesthesia-service	
7. How long is your typical post-anesthesia visit per patient?	

Figure 1 Questionnaire.

< 5 minutes	5–10 minutes	> 10 minutes
8. When do you typically perform your post-anesthesia visits?		
on the day of surgery		on the first postoperative day
on the second postoperative day		on the third postoperative day or later
9. Which contents does your typical post-anesthesia visit have? (multiple answers allowed)		
Questions about the general postoperative condition		
Open questions about postoperative problems and complications		
Specific questions about postoperative problems and complications		
Short physical examination		
Evaluation of the patients chart		
10. Have you ever detected anesthesia-related complications during your post-anesthesia visits?		
Yes, regularly		Yes, infrequently
Yes, intermittently		No, never
11. Do you share the opinion that the regular performance of post-anesthesia visits may...		
... improve the quality of your own work		Yes No
... reduce the incidence of complications		Yes No
12. How important are post-anesthesia visits to you?		
very important		irrelevant
important		completely irrelevant
13. Why do not all of your patients receive a post-anesthesia visit? (multiple answers allowed)		
Lack of time		
Extensive search for the patient necessary		
Long distances to the patient to be covered		
Patients already dismissed home		
I am not interested in post-anesthesia visits		
14. Please answer the following questions regarding your person, department and position		
Sex:	Female	Male
Age:	< 30	30 – 39
	40 – 49	50 – 59
	60 +	
Hospital size:		
No hospital (office based)		500–1000 beds
> 1000 beds		250–500 beds
< 250 beds		
Position:		
Resident (Germany: Assistenzarzt)		
Specialist / Fellow (Germany: Facharzt)		
Senior Specialist (Germany: Funktionsoberarzt)		
Consultant (Germany: Oberarzt)		
Head of Department / Director (Germany: Chefarzt)		

Figure 1 (Continued)

sequence of questions and answers was arbitrarily changed. Retest reliability was 0.872 (Pearson correlation; $p < 0.01$).

Implementation of the survey

The questionnaire was built using a commercial web-based online platform (Equestionnaire™). Using a commercial serial email program (SuperMailer™), 3955 members of the German Society of Anesthesiology and Intensive Care

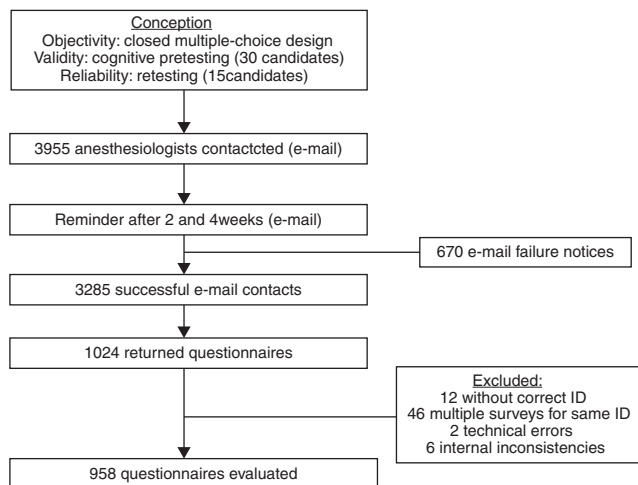


Figure 2 Flowchart of the study process. ID, identifying number for each anesthesiologist.

Medicine (DGAI) were contacted. Anonymization was established by assigning Identification Numbers (ID) to each email. After a waiting time of two and four weeks, a reminder was sent by email to recruit as many respondents as possible.

Any survey that was completed without a correct ID, or that contained an ID that was found in more than one survey, resulted in the exclusion of all affected respondents. Any questionnaire that was completed in less than 120 s was tested for internal consistency by comparing the answers of different items that would result in impossible constellations.

Statistical analysis

Statistical evaluation was performed using the software SigmaPlot 9.0 with SigmaStat integration (Erkrath, Germany). Parametric data was compared using a one-way ANOVA, after passing normality test, followed by a post hoc multiple comparison according to the Student–Newman–Keuls method. Non-parametric data were compared using a Mann–Whitney *U* test, followed by a post hoc multiple comparison according to the Dunn’s method. A value for $p < 0.05$ was considered significant.

Results

Responder rate and exclusions

Of 3955 email addresses provided by the DGAI, 670 contacts resulted in e-mail failure notices; leaving 3285 functioning email addresses (Fig. 2). From these, 1024 completed surveys were returned (return rate = 31.2%). In total, 66 respondents had to be excluded because they did not contain a correct ID number ($n = 12$), because of more than one completed questionnaire for the same ID ($n = 46$), because of technical difficulties ($n = 2$), or because of inconsistencies within the answered questionnaires ($n = 6$). Final assessment of the survey included 958 completed questionnaires. Demographic data is displayed in Table 1.

Table 1 Demographic data.

	Total <i>n</i> (%)
Gender	
Female	200 (21.03%)
Male	751 (78.97%)
Age	
<30 years	7 (0.73%)
30–39 years	359 (37.51%)
40–49 years	360 (37.62%)
50–59 years	199 (20.79%)
>60 years	32 (3.34%)
Size of hospital	
Not working in a hospital (office-based)	7 (0.73%)
>250 beds	171 (17.85%)
251–500 beds	284 (29.65%)
501–1000 beds	267 (27.87%)
>1000 beds	233 (24.32%)
Position	
Resident	186 (19.42%)
Specialist/Fellow	220 (22.96%)
Senior Specialist	54 (5.64%)
Consultant	310 (32.36%)
Head of Department/Director	188 (19.62%)

Quantity of PAV

Respondents estimated that only a small portion of all anesthetized patients in their institution had received a PAV during the last year (median: 20.0%; mean 31.9%; 25th to 75th percentile: 10.0–42.5%) (Fig. 3). While 7.8% of respondents claim that they employ a specific PAV service, 16.7% respond that they do not perform any PAV at all. In hospitals with a PAV service, the number of visited patients was significantly higher (median: 65.0%, mean 61.4%, 25th to 75th percentile: 30.0–90.0%), compared to hospitals without such a service (median: 20.0%, mean 29.9%, 25th to 75th percentile: 10.0–40.0%; $p < 0.001$ vs. no PAV service) (Fig. 4).

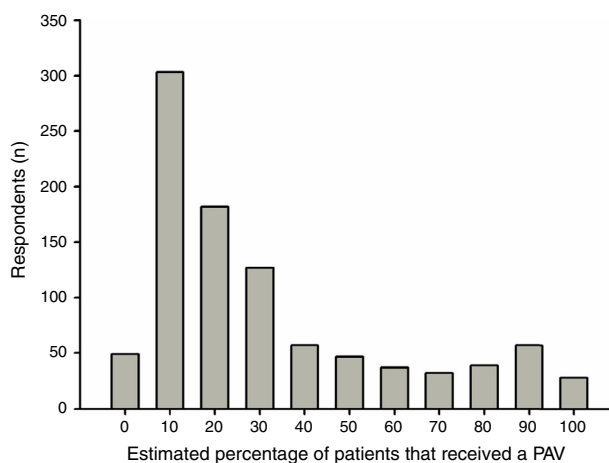


Figure 3 Performance of postanesthesia visits. PAV, postanesthesia visit.

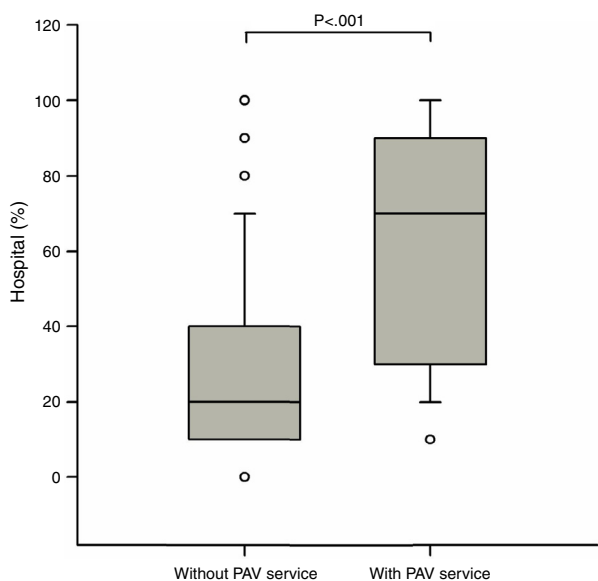


Figure 4 Relevance of a postanesthesia service. Data are presented as median values, 25th to 75th percentiles, minimum/maximum and outliers (circles). PAV, postanesthesia visit.

PAV service was established more often in smaller hospitals; however, this was not statistically significant (<250 beds: 26%, 251–500 beds: 35%, 501–1000 beds: 20%, >1000 beds: 19%).

The estimated percentage of patients that were anaesthetized and visited by the respondents in the last year (median: 20%) was similar to the anticipated percentage of patients anaesthetized by the respondent but visited by colleagues of the respondents (median: 20%). Only 22.0% of all respondents perform PAVs on a daily basis, while almost the same amount of anaesthetists visits their patients less than once a week.

Timing, duration and contents of PAV

Most patients were visited on the day of surgery and on the following day. Less than 10 percent of patients were visited on subsequent days (Fig. 5). Duration of PAVs is typically less than 5 min, and rarely lasts longer than 10 min. Most PAVs included face-to-face interviews with open and closed questions regarding the general condition of the patient, problems and complications. One third of the respondents reviewed the patient’s charts (not evaluated whether paper or electronic), and only a minority performed a physical examination of their patients. A great number of anaesthetists documented the PAV in the chart; however, in 28.8%, no information was documented at all. Almost all respondents detected postoperative complications during PAV, 41.0% infrequently, 33.7% intermittently, and 1.7% regularly.

Significance and problems of PAV

Almost all anaesthetists believed that performance of PAVs improved the quality of their own work, and 76.0% agreed

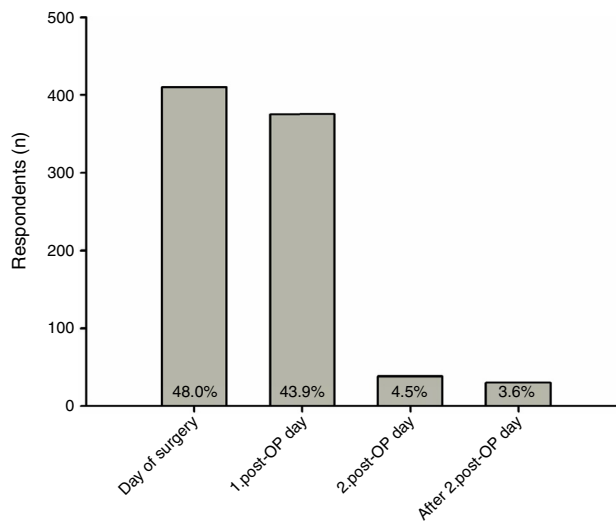


Figure 5 Timing of postanesthesia visits. Post-OP, postoperative.

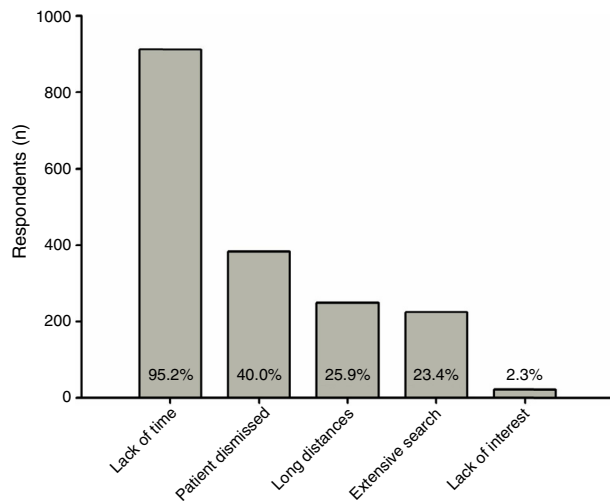


Figure 6 Problem that prevents the regular performance of postanesthesia visits. PAV, postanesthesia visit.

that regular PAVs might reduce perioperative complications. Consequently, over 85.0% of the respondents valued PAVs as very important or important, while 13.0% were indifferent with respect to that question. Only a minority believed that PAVs were irrelevant or completely irrelevant.

Almost all respondents complained a lack of time for performance of PAVs. In over a third of the cases, the anaesthetists claimed that the patients had already been discharged from the hospital. Interestingly, 25.9% of respondents stated that not all patients had to be seen because of long distances that had to be covered to reach the patient (Fig. 6).

Discussion

The present study shows that only a minority of patients receives a postanesthesia visit after surgery. In hospitals with a designated PAV service, the number of visited patients is significantly higher, compared to institutions without such

a service. Most PAVs are conducted on the day of surgery, lasting usually less than 5 min, and are performed after regular working hours. Most anesthetists claim to detect postoperative complications during their visits. Although the majority of anesthesiologists believe that PAVs may improve the quality of their own work and may reduce anesthesia related complications, they criticize a lack of time for this duty.

Although our results indicate that the number of patients that are visited postoperatively is rather low, the question arises what percentage of patients we would like to reach with PAVs. The answer to this complex issue depends on the purpose that we attribute to PAVs. On the one hand, if quality management should be the only reason for PAVs, spot checks may be suitable and sufficient. On the other hand, if we aim for improvements in patient satisfaction, the current performance of PAVs may be regarded too low.

Patient satisfaction could be reached by several means, and multiple questionnaires have been developed to measure satisfaction after receiving general anesthesia.^{11–13} However, the performance of a postoperative questionnaire itself does not increase overall anesthesia satisfaction significantly.⁹ Most importantly, patients express the need to be informed and to feel safe.¹⁴ Both needs cannot be fulfilled by a person who is neither an anesthesiologist nor has been involved in the anesthetic procedure of the specific patient.

Previous studies have shown that patient satisfaction may be significantly improved by PAVs, especially when using face-to-face interviews.⁶ Capuzzo and colleagues demonstrated that more than two visits by anesthesiologists after surgery may significantly increase patient satisfaction.⁴ However, other reports suggest that increasing numbers of PAV do not necessarily increase patient contentment.⁷ Yet, the quality of the visits may be more important than the number of times the patient is visited.²³ The perfect time for such a visit appears to be after 12–24 h after the procedure.¹⁰

While quality management and 'consumer satisfaction' may certainly be regarded important attributes of modern anesthesiology, medical reasons could be more relevant triggers for the performance of PAVs. The purpose of PAVs, when introduced in 1934, was to improve patient care.¹ It was thought that the anesthesiologist should examine his patient to determine any complications due to anesthesia. Although today, patients are usually transferred to a Postoperative Care Unit (PACU) and further to a surgical ward, the detection of anesthesia related complications remains the specialty of the anesthesiologist.^{17–20}

Certainly, we trust our colleagues from the surgical specialties that they will notice anesthesia related complications as well, especially when they are easily perceptible. We further believe that they will inform us about these complications immediately, should they require expert help. However, our study indicates that most respondents have detected postoperative complications during their PAVs; hardly any have never noticed any complications at all.

Unfortunately, the type of complication and their treatment was not further defined in our study, and it is unknown whether these complications would have gone unobserved without PAVs. Only a limited number of respondents have

reported the type of complication after the initial questionnaire; as this was not evaluated systematically, the power of this analysis is weak. Typical complications observed included insufficient analgesia, postoperative nausea and vomiting, vocal cord paralysis, allergic reactions, urinary retention and intraoperative awareness. The anesthesiologist may help not only in detecting these complications, but may also support their treatment, guiding the patient through the process that appears necessary after the anesthetic procedure. In a pilot study, systematic postoperative visits by anesthesiologists reduced the need for internal medicine visits significantly in patients with hip fractures.²⁴

It appears reasonable to assume that without PAVs, a certain percentage of anesthesia related complications would have remained unnoticed. This may especially be true for ambiguous symptoms and obscure syndromes, like the anticholinergic syndrome, or sensory and motor deficiencies after regional anesthesia. Further, we believe that the reported complications could have contributed to a longer hospital stay or increased treatment cost, if they would have not been observed. Thus, it is reasonable to assume that PAVs may not only allow early and specific treatment of such complications, but may also reduce hospital stay, mortality and cost.¹⁰

Based on our findings, a lack of time appears to be the major problem that prevents the regular conduction of postanesthesia visits. Organizational improvements of working conditions may be necessary to allow a regular PAV routine. Our study shows that the implementation of a designated PAV service might be a useful way to significantly increase the number of patients visited postoperatively. Unfortunately, no specific information about these services is available from our survey. Yet, personal communication indicates that hospitals with such a service allow their anesthesiologists a specific time for PAVs (e.g. 1 h at the end of the shift), or employ one anesthetist to perform all PAVs during one day. A written questionnaire could be a useful aid to optimize postoperative visits and patient satisfaction. As our data shows, PAV services did not reach all patients, and the absence of such a service did not mean that no patient was visited. This indicates that the implementation of a PAV service alone is not sufficient to optimize postanesthesia care and may not be the only solution for this task. Especially regarding cost effectiveness, future studies need to evaluate which model is superior in detecting complications in the postanesthesia setting. Sufficient time, precise organizational structures (e.g. standard operating procedures) and maybe even inclusion of this aspect in resident training could be of high value to establish a solid PAV routine.

There are a number of limitations affecting the scope of our survey, the most obvious one being a certain bias. The answers we received were given by registered anesthetists that were in possession of a functioning email address. The analyzed population includes, as demographic data show, mainly male anesthesiologists with at least 10 years of work experience. More than 50% of the respondents are in the position of consultant or head of staff. Although the presumed bias excludes a great number of anesthesia residents, female colleagues and non-DGAI members, this predisposition nevertheless allows an interesting insight into the current practice of postanesthesia visits. Most of the

respondents should have, by position, a broad perception of postanesthesia care. Further, our survey resulted in a response rate of 31 percent. Although reminders were sent and planning of this study involved an expert institution for surveys, we were unable to reach a higher return rate. However, we are still within the typical range for published questionnaire studies in academic journals,²⁵ with 33 percent being the overall mean for online questionnaires. Thus, we believe that our data pool is a sufficient basis for our evaluations. Finally, some respondents may have been members of the same institution. Yet, as we received more than 180 responses from heads of staff, it is reasonable to assume that we received insight into at least 180 departments, if not many more. This should allow a good overview over the practice in a sufficient number of hospitals.

We would like to conclude that currently, only a small number of anesthesiologists perform postanesthesia visits, mainly due to a lack of time for this task. Considering the high appreciation and significance of PAVs and the potential medico-legal consequences of their neglect, it appears desirable to implement organizational improvements for postanesthesia care.

Conflicts of interest

The authors declare no conflicts of interest.

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