Improving the preoperative assessment clinic
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Citation for published version (APA):

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Chapter 8

Summary &

General Discussion
Summary

In anaesthetic care, the first stop on the perioperative route is the preoperative assessment. The aim of preoperative assessment is to reduce the morbidity associated with surgery and anaesthesia, and to improve the patient’s health to the desired level. In the Netherlands, preoperative assessment is now largely performed at the preoperative assessment clinic (PAC). The aim of this thesis was to explore how quality improvement of nonmedical aspects of the PAC might be attained. To determine how the quality improvement might be accomplished the organization and logistics of the PAC were studied, as well as feedback from patients and professionals (chapter 1).

Chapter 2 describes the organizational structure of the PACs at all of the eight university hospitals in the Netherlands. The structure of the PACs showed large differences. Opening hours differed between PACs. Consultations were on appointment, on a walk-in base, or a combination of these two. Not all PACs were equipped to perform additional diagnostic testing. The staffing of the PAC also varied. The preoperative assessment was either performed by an anaesthesiologist or by a resident, a physician assistant or a nurse practitioner under supervision of an anaesthesiologist. A PAC that was visited by more patients did not necessarily have more staff. Thus, even within one nation with a uniform healthcare system, the organizational structure of the PACs shows a large diversity. This large diversity is even seen within the relative homogeneous group of university hospitals.

As shown in Chapter 2, hospitals have organized their PACs differently. These differences in organizational structure can influence patient flow times, i.e. the total time spent at the PAC. Chapter 3 describes the difference in patient flow time at the PAC of two university hospitals, Leiden University Medical Centre (LUMC) and the Academic Medical Centre (AMC). The two PACs differed in their capacity (education and work experience) of staff, the planning of appointments, the opening hours, and the number of patients visiting annually. An important
difference was the organization of additional diagnostic testing. In contrast to the AMC, where electrocardiograms (ECGs) and venepunctures were performed at the general outpatient laboratory, the LUMC was equipped to perform these tests at the PAC. The patient flow times and waiting times were significantly longer at the AMC. Patient flow times and waiting times were shorter when ECG and venepuncture were performed at the PAC, on the spot. However, more tests were requested when they were performed at the PAC. Total waiting time turned out to be shorter if a patient’s co-morbidity was taken into account when planning the appointment interval (LUMC), as more time was needed to assess patients' with a higher ASA class.

The significant difference in patient flow time between the AMC and LUMC was the trigger for the study described in chapter 4. In this study, the long waiting times and access times found at the PAC of the AMC were analyzed systematically. For this purpose, two simulation models were validated for the PAC. Subsequently, different scenarios were tested to reduce the access time and the waiting times. Simulation showed the current capacity, i.e. consultations per day, to be enough to meet demand. Nevertheless, a backlog existed, which can only be eliminated by providing temporarily extra capacity. In accordance with chapter 2, we found that the waiting times could decrease by making the reserved consultation time dependent on a patient’s co-morbidity, or ASA physical status.

To investigate the PAC’s quality of care from the patients' point of view, we decided to measure the patient experiences with the PAC. To do this, we first developed and validated the Patient Experiences with the Preoperative Assessment Clinic (PEPAC) questionnaire. The process is described in chapter 5. The National Health Service outpatient questionnaire was adapted and questions specific for anaesthesiology were incorporated into the questionnaire. After a pilot phase, the questionnaire was sent to 700 consecutive patients (response 74%). To make the PEPAC appropriate for quantitative measurements, five multiple-item scales measuring five dimensions of patient experiences were constructed: 1) reception, 2) waiting, 3) the nurse, 4) the anaesthetist, and 5) other questions. Reliability, the
extent to which the questionnaire gives consistent and reproducible results, was established by computing Cronbach’s alpha coefficients. Cronbach’s alpha ranged from 0.56 to 0.84, supporting reliability of the PEPAC. Both patients and health professionals ascertained that all items of the questionnaire were relevant to the PAC, and that the PEPAC represented all facets of the PAC (content validity). Construct validity was assessed by correlating the dimensions with the patient’s overall appraisal of the PAC, as it was hypothesized that the different dimensions should be reflected in the patient’s overall appraisal of the care given. Correlations ranged from 0.22 to 0.56. Together, the dimensions should explain a substantial level of the variance of the patients’ overall appraisal; therefore regression analysis was performed. Collectively, the five scales explained 51% of patients’ overall appraisal, supporting validity of the PEPAC.

Subsequently, the PEPAC was used to obtain detailed patient feedback, and to determine the value patients and professionals attach to different aspects of care, in order to set priorities to improve the PAC (chapter 6). The PAC’s standard of service was determined for the five dimensions by calculating patients’ mean dimension score. The importance patients attach to a care aspect was determined by calculating the effects of the dimensions on patients’ overall appraisal; for professionals, this was determined by asking them to rate the importance of the different care aspects. The priorities for improvement were predominantly determined by the standard of service, as the importance attached to the five care aspects was similar, for patients and for professionals. When combining the PAC’s standard of service with the value given to the dimensions by patients and professionals separately, waiting was in greatest need of improvement. This was followed by reception, the anaesthetist, remaining experiences, and finally the nurse. The dimension waiting could improve considerably by notifying patients about the length and the reason of the waiting time. Reception might improve by informing patients about what will happen during their visit at the PAC. The anaesthetist should give more information, particularly on what happens in the operating room, risks and side effects of anaesthesia, pain control, medication, and fasting. Giving patients a choice of appointment dates and times, and giving them a
brochure with information about the PAC might raise the dimension score for remaining experiences. This study shows that the quality of a PAC can improve by obtaining patients’ feedback on the quality of the PAC. Their feedback can be used to determine a PAC’s standard of service, to recognize service areas that require improvement, and to identify actions appropriate to bring about improvement. The value patients and professionals attach to different aspects of care can then be used to prioritize the planned actions.

**Chapter 7** describes the effects of implementing a new appointment system on waiting times and patient experiences with the PAC. The new appointment system was based on the results of the simulation study described in chapter 4; the reserved consultation time was increased and made dependent on patients’ ASA physical status. Instead of 15 min for all patients irrespective of their ASA physical status, the reserved consultation time was increased to 20 min for patients with ASA class I or II and to 30 min for patients with ASA class III or IV. To determine the effect of this new appointment system on the waiting times at the PAC, the patient flow times were measured at the PAC during a three week period. Subsequently, the procedure time with the nurse and the physician, and the waiting times were calculated. To determine the effect of the new appointment system on patient experiences with the PAC, a survey was performed, using the PEPAC questionnaire. Waiting times and patients’ experiences before and after implementation of the new appointment system were compared: the mean total waiting time was reduced from 26 (SD 23) min to 16 (15) min. On a 0-100 scale, patients’ experiences with waiting improved from 49 (19) to 52 (18), and patients’ mean overall appraisal of the PAC increased from 78 (16) to 81 (14). Besides reducing waiting times, by making the reserved consultation time dependent on patients’ ASA physical status, all efforts should be made to ensure that physicians start on time and that patients arrive punctually. If, regardless of this, waiting times do occur, patients should be informed about the length and the reason of the waiting time.
General discussion

The main findings will be discussed along four lines: 1) conceptual considerations, 2) methodological considerations, 3) implications for practice and 4) further study and future directions.

Conceptual considerations

The studies described in this thesis focus on the Preoperative Assessment Clinic (PAC). The aim was to explore the organization and logistic processes and to obtain feedback from patients and professionals on the quality of the PAC, in order to determine how quality improvement can be attained.

Addressing quality improvement gives rise to the question ‘What is quality?’: According to the Oxford dictionary quality is 1) the standard of something as measured against other things of a similar kind > general excellence, 2) a distinctive attribute or characteristic. According to Robert Pirsig, “Quality is a characteristic of thought and statement that is recognized by a nonthinking process. Because definitions are a product of rigid, formal thinking, quality cannot be defined. But even though Quality cannot be defined, you know what Quality is!”

We might know what quality is, but dependent on the context and the person assessing the quality, different aspects of quality will be important. Like beauty, quality may lie in the eye of the beholder; it is a multi-faceted measure. For healthcare this implies that quality of care may not necessarily be valued similarly by patients, physicians, hospital administrators, insurance companies, and government.

Healthcare professionals continuously pursue quality improvement. Quality measurement is not obligatory for quality improvement, but it plays an important role. Traditionally, healthcare services were largely paternalistic, with the focus on diagnosing and treating the patient. The quality of healthcare was mainly assessed by just one quality measure, namely medical outcomes.
Donabedian, quality measures can be divided into three categories: structural measures, process measures and outcome measures. It has become clear that structure, process and outcome are interrelated. Thus, focusing solely on outcome will give suboptimal improvement; for integral quality improvement, process and structure should also be evaluated.

With the shift from paternalistic healthcare to patient centered care, the awareness of the importance of structural and process measures increased. It has been acknowledged that non-medical issues, e.g. communication, information, continuity of care, and waiting times, are also of great importance to patients. Indeed, just recently McKinsey published a study showing that commercially insured, American patients mainly choose facilities to be treated in based on non-clinical aspects.

Patient experiences can be used as an indicator for the quality of health care. Moreover, patients’ views and perceived priorities can play an important role in improving the quality of healthcare services. Obtaining patients’ feedback helps to reveal the value patients attach to various aspects of healthcare, which might vary considerably from healthcare providers' views.

This thesis focuses on non-medical issues of the PAC. Though we acknowledge the importance of health outcome measures, the quality of the preoperative assessment from a medical point of view was not considered.

**Methodological considerations**

**Generalizability**

Long access times and long waiting times are two well-known problems for outpatient clinics. These two planning difficulties are also encountered at the PAC. With two simulation models we tested different scenarios to reduce access time and waiting times. We set a criterion: 1) the number of appointments needed to reduce the access time from 5 weeks to 10 working days for 95% of all patients was determined. This number will differ for other PACs, as it is dependent on the
demand, the week schedule of the PAC, and the desired service level. However, with adaptation in the input, the simulation model as described can be used to calculate the number of appointments needed to reduce the access time in another setting. 2) The reserved consultation time needed to reduce the maximum waiting time to 10 minutes for 95% of all patients was also determined. We found that a reserved consultation time of 18 min is needed for patients with ASA class I or II and 30 min for patients with ASA class III or IV. These times are based on preoperative assessment at a PAC where approximately $\frac{2}{3}$ of the patients are seen by a resident and $\frac{1}{3}$ by an anaesthesiologist. Other times will apply if the preoperative assessment is only performed by anaesthesiologists, or when the assessment is performed by nurse practitioners or physician assistants. Nonetheless, making the reserved consultation time dependent on patients’ ASA physical status reduces the variation in the difference between the reserved consultation time and the actual consultation time, which gives a reduction in waiting times.

To measure the quality of the PAC from the patients’ point of view we used the Patient Experiences with the Preoperative Assessment Clinic (PEPAC) questionnaire. The PEPAC is a comprehensive, reliable, and validated questionnaire and has been recommended by Heidegger for assessing patient experiences with the PAC. However, as the organization of PACs is not uniform, slight adaptations to the PEPAC might be needed in order for other PACs to be able to use it.

The PEPAC was used to determine the standard of service at our PAC, together with the value patients and professionals attach to different care aspects, in order to set priorities for improvement. Standards of service will differ for other institutions, as might the value patients and professionals attach to care aspects. However, the same approach to setting priorities for improvement of the PAC can be used elsewhere.
Study design

We compared the patient flow times at the PACs of Leiden University Medical Centre (LUMC) and the Academic Medical Centre (AMC), two university hospitals with similar tasks. Though patients were mainly seen without an appointment in the LUMC waiting times were significantly shorter as compared to the AMC, where most patients were seen on appointment. This is contrary to what one would expect. It was difficult to interpret this difference in waiting times as many variables differed: the AMC employed less staff and was open for fewer hours than the LUMC. However, more patients were seen at the AMC. We were not able to distinguish the individual influence of these variables on the patient flow and waiting times.

To test different scenarios to reduce the waiting times and the access time at the PAC of the AMC, we used two simulation models. A simulation model provides insight in the way a system operates and is a helpful tool for capacity planning. However, a simulation model remains a model: it gives a simplified account of reality. Although a good prediction can be made of the results of an intervention, it is a prediction. The actual result of an intervention must be evaluated to ensure it has had the desired effect. After the new appointment system (based on the results of the simulation models) was implemented, we measured the waiting times to ascertain whether we attained the aimed service level. The aimed service level was a maximum waiting time of 10 min for 95% of all patients. Though a substantial reduction of the waiting time was realized, this service level was not attained.

We developed and validated the PEPAC questionnaire to measure patient experiences with the PAC. With 72 items, the PEPAC is rather lengthy, making it quite a task for patients to fill out the questionnaire: the average time of completion was 15 min. However, this did not affect the response rate, which was high in both studies performed with the PEPAC. The detailed feedback which results from a survey with such a comprehensive questionnaire provides clear insight into the
service areas that are not performing well, and gives an indication on how improvement can best be achieved.

The PEPAC includes six questions on patients’ sociodemographic characteristics: gender, age, educational level, health rating, fluency of the Dutch language, and ethnicity. The sociodemographic characteristics available in our studies for non-respondents were gender and age. Non-response may have given some bias of the results. However, only a very small relationship has been found between patient sociodemographic characteristics and satisfaction with medical care, with age being the strongest correlate of satisfaction.\textsuperscript{15} In our studies, respondents were slightly older than non-respondents. As older patients are inclined to be somewhat more satisfied with care,\textsuperscript{15} this may have resulted in more positive scores. However, since we had a high response rate in both studies, we do not expect such bias to have had substantial influence on the results.

The PEPAC questionnaire was used to determine the value patients and professionals attach to different care aspects in order to set priorities for improvement. Professionals were asked to rate the importance of the items of the PEPAC questionnaire, using a 3-point scale (1 = very important, 2 = somewhat important, 3 = not so important). We did not ask patients to rate the importance of the items directly, but used statistical analysis to determine the value patients attach to different care aspects. It would be interesting to validate patients’ importance ratings of the items with the same 3-point scale given to the professionals.

**Implications for practice**

In the Netherlands, the importance of structural and process measures was enhanced by the introduction of a more market-driven healthcare in 2005. The Dutch government wanted to stimulate market forces in the healthcare sector, in order to manage hospital and specialist care costs. Therefore, the reimbursement system of hospitals is now based on \textit{actual} output. Moreover, reimbursement is currently based on a case-mix of which 20\% of the prices are negotiable with insurance companies and 80\% are fixed for non-academic hospitals. However, in
the future, the Dutch government plans to grow to a case-mix of 80% negotiable prices and 20% fixed prices, putting more pressure on hospitals with respect to quality, efficiency and efficacy. The new market-driven healthcare system is increasingly steered by patients’ wishes and aims to offer patients a choice. The competitors need to excel in the quality of care delivered: the best medical outcomes and patients’ appraisal at the lowest costs (micro-economic efficiency). Logistic improvements often result in a reduction in costs. In addition, they improve patients’ experiences with healthcare services and can contribute to an improved medical outcome. To enable patients to make a conscious choice between healthcare providers, healthcare transparency regarding quality and costs is needed.

High quality of the PAC is essential for a hospital, as the PAC is a vital link in perioperative care. All surgical specialties are dependent on the PAC and, conceivably, its quality will therefore indirectly reflect on all surgical departments. In anaesthetic care, the preoperative assessment is the first stop on the perioperative route and for many patients the PAC is the first encounter with the department of anaesthesiology. Therefore, the PAC can be considered the department’s calling card. A streamlined preoperative assessment is essential for leaving a lasting positive first impression.

In this thesis, the focus was on finding quality improvement measures by exploring the organization and logistic processes of the PAC and obtaining feedback from patients and professionals on the quality of the PAC. Using the results of the simulation study described in chapter 4, we redesigned our appointment system. Without changing capacity, waiting times at our PAC decreased, by making the reserved consultation time dependent on patients’ ASA physical status. Other PACs can use this principle of making the reserved consultation time dependent on patients’ ASA physical status to reduce their waiting times. Regardless of the organizational structure of a PAC, making the reserved consultation time dependent on patients’ ASA physical status will reduce the variation in the
difference between the reserved consultation time and the actual consultation time, resulting in a reduction of waiting times.

With the PEPAC questionnaire, we obtained patients’ feedback on the quality of the PAC. It provided useful information on how to improve care aspects of the PAC that are of importance to the patient. Patients appreciate a choice of appointment dates and times, and being informed about the length and the reason of the waiting time. Satisfaction with reception can increase by telling patients what will happen during their visit to the PAC. In addition, a brochure with information about the PAC should be supplied. The anaesthesiologist should provide more information, especially on what happens in the operating room, risks and side effects of anaesthesia, pain control, medication, and fasting. The PEPAC can also be used by other PACs to assess patient experiences, in order to help improve the quality of their PAC.

**Further study and future directions**

The PAC has been implemented in most major hospitals, but there is no uniformity in their organization, as we confirmed when we compared the organizational structure of the PACs from the eight Dutch university hospitals (chapter 2). A future step would be a benchmark study to find best practices for organizing a PAC. Further study of waiting time reduction is needed. For the PAC we have studied, some more improvements can be suggested. Though, implementation of a new appointment system gave a considerable reduction in the waiting times, the aimed service level (maximum waiting time of 10 min for 95% of all patients) was not achieved. Future points of focus might be addressing patients’ and professionals’ unpunctuality. Development of a more sensitive triage instrument would be interesting. A good estimation of patients’ ASA physical status can help to allocate patients to the correct appointment slots. Presently, a health questionnaire is used, but it is not very sensitive: 86% of ASA class I and II patients were identified correctly and only 35% of the patients with ASA class III and IV. Alternatively, the consultation with
the nurse might take place before making the appointment, allowing triage by the nurse. A triage system could also encompass additional testing being performed prior to the appointment date, which is not yet the case at our PAC. By doing so, the results of the tests will be available when the patient comes to the PAC. If necessary, appropriate actions can be taken during the preoperative assessment, reducing the amount of back-office work. Further study is needed to elucidate if these actions improve the logistical processes and increase efficiency.

A study to develop and validate a questionnaire to measure professionals’ experiences with the PAC would be very interesting, as this does not exist as yet. Analogous to patient experiences, professionals’ experiences can help to improve the PAC’s quality. Their feedback on the PAC reveals the service areas that are not performing well and require improvement and helps to identify the appropriate actions to bring about improvement. Measuring patients’ and professionals’ experiences to improve the quality of the PAC should be a continuous process, not a one-off event. When improvement points have been addressed, a new survey should be performed to ascertain the changes have had the desired effect from the patients’ or professionals’ perspective. In addition, monitoring is necessary to ensure an improvement is maintained over time.

In this thesis, organizational and logistical processes of the PAC were analyzed and feedback on the quality of the PAC was obtained from patients and professionals, in order to determine how to improve the quality of the PAC: another step forward on the road to improvement of the preoperative assessment clinic.
References