Development and implementation of an EPR: how to encourage the user

M.J. van der Meijden [a],*, H. Tange [a], J. Troost [b], A. Hasman [a]

[a] *Department of Medical Informatics, Maastricht University, P.O. Box 616, 6200 MD, Maastricht, The Netherlands*
[b] *Department of Neurology, Maastricht University Hospital, Maastricht, The Netherlands*

Abstract

This paper reports on the role users played in the design and development of an electronic patient record. Two key users participated in the project team. All future users received questionnaires and a selection of them was interviewed. Before starting the development of the EPR, the attitude of users towards electronic record keeping, their satisfaction with the paper clinical records, their knowledge of computers, and their needs and expectations of computer applications in health care were measured by means of a questionnaire. The results of the questionnaire were supplemented with in-depth interviews. Users had a neutral attitude towards electronic record keeping. They were more positive about data entry of the paper records than data retrieval. During the development phase, but prior to the implementation of the EPR, a second questionnaire measured satisfaction with the paper records. Satisfaction appeared to be related to self-rated computer experience. Inexperienced computer users tended to be more positive about the paper records. In general, respondents did not have many expectations about electronic record keeping. A second series of interviews zoomed in on the expectations users had. Except for more concise reporting no beneficial effects of electronic record keeping were expected. © 2001 Elsevier Science Ireland Ltd. All rights reserved.

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1. Introduction

Information technology (IT) is believed to create many opportunities in health care. One is the computerised support of the primary process. In 1990, a study of the Institute of Medicine (IOM) identified the strengths and weaknesses of paper based records [1]. Poor availability, illegibility, poor organisation and incompleteness are such weaknesses. These shortcomings are often used to justify the call for widespread use of electronic record keeping [2]. Access to clinical information can be improved by well-organised, legible data, but also with availability of information at several places simultaneously. Nowadays, the process of care is still mainly supported by paper-based medical and nursing records.

* Corresponding author. Tel.: +31-43-3882248; fax: +31-43-3884170.

E-mail address: m.vandermeijden@mi.unimaas.nl (M.J. van der Meijden).

These records play an important role in accumulating information and coordinating medical work [3]. Patient records are not simple stores and sources of information that are filled and referred to whenever necessary, but they also influence medical work. Berg explained that paper records and health care workers interact with each other and mutually affect each other [3]. Hence, the information present in the records is not simply the basis of decision-making, it has an influence on the decisions made as well. In the process of computerisation of paper records this is an important aspect to consider, because it means that records are not just tools in the hands of a doctor or a nurse. It also explains why electronic records need to be tailored to the work practices in order not to obstruct the process of care. Tange analysed the satisfaction of physicians with paper based medical records in the Maastricht University Hospital [2]. They appeared to be rather satisfied with their paper records, although data retrieval could be improved. Opportunities of IT, then, lie in those features that reduce administrative tasks of health care workers, performing computations or generating reminders in case of specific events for example [3]. To increase the usability of systems the involvement of health care workers in design and development processes of electronic record systems is important [4]. Moreover, considering the attitude of future users in the process of development and implementation is important to increase final acceptance [5].

The Department of Medical Informatics, Maastricht University, co-operates with the Department of Neurology, Academic Hospital Maastricht, to develop and implement an electronic patient record (EPR) for stroke patients [6,7]. In this project we involved the future users in an early stage, which served three purposes: (1) to determine the required functionality of the EPR; (2) to create and increase social support; and (3) to measure social support for the EPR. The purpose of this paper is to describe in more detail the participation of our future users, realised as follows:

- Two nurses and two residents were actively involved as key users in the development process to determine and test functionality and to create social support. They were expected to act as change agents.
- We measured the attitude, knowledge and expectations about the use of computers in health care of all potential users by means of a questionnaire. These results served to determine the training the users required, to measure the social support for our project and to trigger the interest and curiosity of potential users.
- We conducted in-depth interviews to clarify and supplement the questionnaire results. Additionally, we wanted to assess and increase social support with these interviews.

2. Methods

Data were collected with two different questionnaires and two sets of in-depth interviews. The aim of the interviews was to explain and supplement the results of the questionnaires. Fig. 1 explains how questionnaires and interviews relate to each other in time and content.

2.1. Questionnaire 1

In March 1998, all 63 future users (nine specialists, 12 residents and 42 nurses) of the neurology department received a questionnaire to measure their attitude towards computers. The questionnaire contained nine general questions, asking for age, sex, profes-

sion, years of working experience, respondents indicated their actual usage of the paper records (daily–weekly–irregularly–no usage at all), usage of the hospital information system and other office-computer applications and how they judged their own computer experience (Fig. 1 Q1A). The questionnaire further contained 21 items to measure the users' attitude derived from several existing attitude scales (Fig. 1 Q1B) [8–14]. The questions focussed on whether the respondents expected that their work would become easier or better with an EPR, what their general feelings were about computerising the clinical records, how urgent the need was for computerising the records, whether they expected improvement of record keeping with an EPR, and whether they feared that with an EPR it would take longer to enter or retrieve data, or that it would limit them in different aspects of their work. All items were scored on a five-point Likert scale.

2.2. Interviews 1

Supplementary to this questionnaire, two nurses, two residents and the nurses' team leader were interviewed to discuss the paper records and to elicit their ideas and feelings about an electronic patient record (Fig. 1 I1B, C). Therefore, these interviews were not structured.

2.3. Questionnaire 2

A second questionnaire was sent to 65 potential users in February 1999. The population of the department had slightly changed and consisted of nine specialists, 14 residents and 42 nurses. This second questionnaire was divided into four sections. Section one (Fig. 1 Q2A) contained the same general questions as the first questionnaire. The rest of the questionnaire was different from the first one. Section two (Fig. 1 Q2D) contained 24 items about the respondent's satisfaction with the
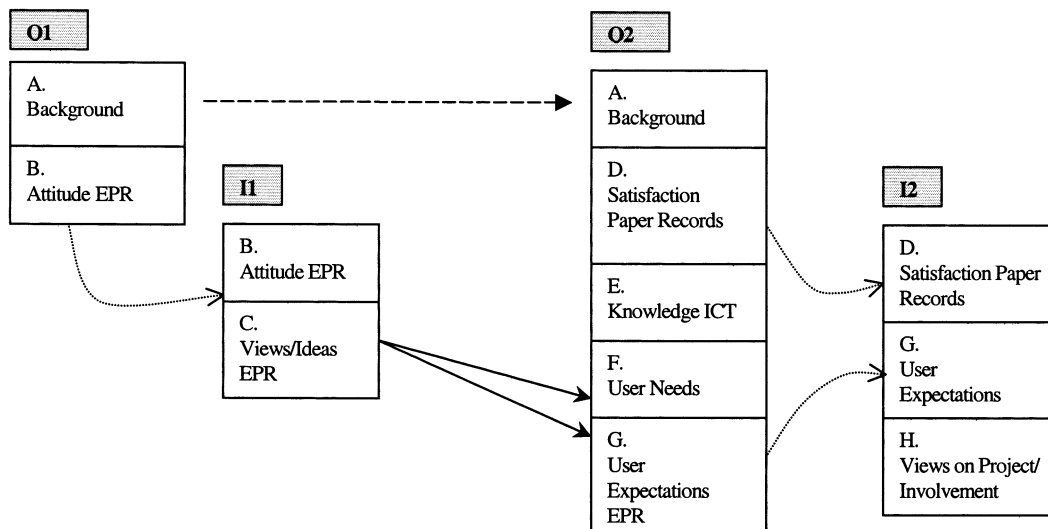

Fig. 1. User involvement was partly established with questionnaires (Q1 and Q2) and interviews (I1 and I2). Background questions were similar in both questionnaires. The results of section C of Q1 were the basis of I1 and a preparation for Q2, sections F and G. The results of sections D and G of Q2 were elaborated in I2. similar questions ---▶ ; question making ──▶ ; elaboration ·······▷.

paper medical and nursing records. These items were scored on a five-point Likert scale. Users also marked the significance of each item. Items rated 'not important' by a respondent were excluded from the analysis for that specific respondent. The items were selected from a previously developed questionnaire [2]. Section 3 and 4 were based on the questionnaire developed by Cork et al. [15]. Section three contained 18 pairs of terms that are related to computers and computer usage, e.g. floppy–hard disk. Respondents indicated to what extent they thought they knew what the distinction between the two terms was. These items were categorised on a three-point Likert scale. Section four was divided into two parts, I (Fig. 1 Q2F) and II (Fig. 1 Q2G). In part I the respondents were asked to score the need for certain features of computer applications in health care, e.g. "I have access to the system where I need it". The 14 items in part I were scored on a four-point Likert scale, plus an 'unable to respond'-option. Part II consisted of 16 items to measure the expected influence of computer applications on health care, e.g. "how do you think computer applications will influence the costs of health care, or the quality of care". These items were scored on a five-point Likert scale. Since all items in this questionnaire were positively worded, higher scores mean that respondents are more satisfied, possess more knowledge, positive effects or features being more necessary.

2.4. Interviews 2

Three months prior to the implementation, nine semi-structured in-depth interviews were held with two residents, four nurses, the head of the department, the head nurse and the IT manager of the department. The interview for the end-users was divided into three clusters (Fig. 1 I2D, G and H). Cluster one (Fig. 1 I2D) contained six questions about the positive and negative aspects and the usage of the paper clinical records. In cluster two (Fig. 1 I2H) the respondents answered five questions about development and implementation of the EPR, e.g. "What do you know about the EPR?" In cluster three (Fig. 1 I2G) of these interviews the expected impact of computer applications on several aspects of daily practice, like communication with colleagues within the department and within the hospital, the quality of record keeping, expected changes in work procedures, were elaborated. In the interviews with the managers, the positive and negative aspects of paper records were only addressed indirectly. Instead, the interview concentrated on their opinion about the course of the whole project and their expectations of the implementation. Those results, however, have not been included in this paper.

2.5. Analysis

Statistical analysis of the questionnaires was performed with SPSS version 8.0. The mean score of all attitude statements were combined to one mean score. Likewise, an overall score for satisfaction, knowledge and expectations of health care applications were calculated. We used the independent t-test to test for differences between experienced and inexperienced users and the paired sample t-test to test for differences in satisfaction between (aspects of) medical and nursing record. The first author held the first set of interviews, and an independent interviewer familiar with the situation at the department, did the second series of interviews. The second set of interviews was analysed with the aid of QSR NUD*ist, a software package to analyse qualitative data.

Table 1
Mean scores of answers to individual questions of respondents who considered themselves experienced or inexperienced computer users. Items were rated on a 5-point Likert scale, where 1 = fully disagree and 5 = fully agree

	Experienced			Inexperienced		
	Mean	S.D.	n	Mean	S.D.	n
I am afraid that …						
Data entry will cost more time in an EPR*	2.6	1.6	13	3.7	1.2	26
Data retrieval will cost more time in an EPR*	2.2	1.5	13	3.3	1.3	27
It will take a long time to learn to work with an EPR*	2.5	1.4	13	3.4	1.0	27
I think that …						
An EPR can help to improve the quality of care*	4.0	0.8	13	3.0	1.5	27

* $P < 0.05$.

3. Results

3.1. Background of the users

In March 1998 the users received the questionnaire to measure their attitude towards computerising the paper clinical patient records. Forty-one of the 63 questionnaires were returned completely filled in (65%). Nurses had the lowest response rate, 52% of them returned the questionnaire. The response rate of residents and specialists was 92% and 82%, respectively. Twenty-eight respondents were younger than 40 and on average the respondents had 12.6 years of working experience (range 0–35). Twenty-seven (66%) respondents classified themselves as inexperienced computer users. Five respondents hardly used the hospital information system (HIS), and 36 of them used it frequently. Moreover, about 75% of the respondents indicated to use a computer at work and/or at home—besides the HIS.

The second questionnaire was distributed in February 1999. It dealt with the satisfaction of users with paper clinical medical and nursing records, their knowledge of computers and their expectations of applications in health care. The overall response rate was 66%; six specialists, 14 residents and 22 nurses returned the questionnaire. Twenty-two respondents were male, 32 were younger than 40 and on average the respondents had 11.5 years of working experience (range 0–24). Twenty-six (62%) of the respondents classified themselves as illiterate or inexperienced computer users, whereas 16 (38%) thought of themselves as experienced computer users. Only three in the latter group were nurses, 11 were residents. The HIS was used daily by 36 respondents, and weekly or monthly by six of them. Fourteen nurses, 12 residents and five specialists actually used the medical record. All of the responding nurses, four residents and four specialists actually used the nursing record. Thus, not every respondent made use of both records.

3.2. Attitudes towards an EPR

The overall mean attitude score was 3.2 (S.D. 0.69; $n = 41$; Q1B). Inexperienced computer users had a less positive attitude towards an EPR than experienced users (mean 3.0 S.D. 0.73 $n = 27$ vs mean 3.6 S.D. 0.45 $n = 13$; $P < 0.05$ t-test). Table 1 shows the results of those questions in this questionnaire that showed significant differences be-

tween experienced and inexperienced users. In comparison with experienced respondents, inexperienced respondents thought that an EPR would cost them more time to enter data into and to retrieve data from with, and that it would take a long time to learn to work with an EPR. In addition, experienced users agreed more with the statement that an EPR can contribute to improving the quality of care.

In the first set of interviews, the respondents were not negative about electronic record keeping which supports the results of the questionnaire. However, they had a critical attitude: what do we gain when we invest in electronic record keeping? Most respondents stressed that verbal communication should complement electronic record keeping and should not replace it. The dialogue about patients was said to be vital for good care. Moreover, concern was expressed about electronic records making life too easy so nurses would not (need to) think anymore before acting. Nevertheless, one—rather sceptical—resident came to the conclusion that an EPR could have some positive aspects. Furthermore, nurses commented that at first all new work routines invoked resistance and difficulties, but in the end everybody got used.

3.3. Satisfaction with paper records

In general, the users were relatively satisfied with their paper clinical records. In one of the first interviews a resident made the following remark about paper records "… I cannot name the disadvantages of the current (paper) record system. There are no aspects that I would say about: that needs to be improved." During the interview this resident came to the conclusion that some aspects of paper records could be improved by an EPR. The following example was mentioned: dividing the medical progress notes into chapters e.g. assessment notes, medication, diagnostic tests, could overcome the problems with just chronologically adding information to these notes. To the question in the questionnaire if in general their paper record was user friendly, the residents and specialists answered on average 3.6 (S.D. 0.9; $n = 19$), whereas the nurses answered on average 4.0 (S.D. 0.6; $n = 21$). Thus, the residents were slightly positive about their paper records, nurses were more positive. Overall, the users of the medical and the nursing record were more satisfied about data entry than about data retrieval of the paper records (Table 2).

Table 2
Satisfaction with data entry and data retrieval aspects of medical and nursing paper record (paired t-test)

Satisfaction	Data entry		Data retrieval		
	Mean	S.D.	Mean	S.D.	n
Medical record**	3.6	0.9	3.0	0.5	28
Nursing record**	3.8	0.9	3.4	0.9	27

** $P < 0.01$.
Items were rated on a 5-point Likert scale, where 1 = fully disagree and 5 = fully agree.

Table 3
Mean satisfaction scores of inexperienced and experienced users for the medical and nursing records

Satisfaction	Experienced			Inexperienced		
	Mean	S.D.	n	Mean	S.D.	n
Overall						
Medical record	3.4	0.67	14	3.3	0.72	16
Nursing record*	3.1	0.67	7	3.7	0.72	21
Data entry						
Medical record	3.4	1.07	13	3.7	0.72	15
Nursing record	3.3	0.89	6	3.9	0.83	21
Data retrieval						
Medical record	3.1	0.73	14	3.0	0.57	16
Nursing record	2.8	0.81	7	3.5	0.79	21

* $P < 0.05$.

Items were rated on a 5-point Likert scale, where 1 = fully disagree and 5 = fully agree

Having the possibility to browse for information by flipping through pages was clearly regarded as a positive aspect of paper records, as became clear in the second set of interviews with nurses and residents. However, this was also mentioned to be a negative feature of paper records, because data are lost in thick piles of paper, overview is lacking due to scattered information throughout the record, relevant data are documented only in the medical record, or only in the nursing record. Moreover, data are often not found where expected, especially if data should be documented at multiple places in the records. An interviewed (inexperienced) resident commented on the overview of data. She had overview "if I write it (patient data) myself, yes … If I take over a patient, it usually requires an intensive search to collect all necessary information …". In addition, the portability of the paper records was valued highly, because data could be documented where assessed.

The nursing record was more structured than the medical record and the nurses thought their record to be more clear and legible than the medical record. On the other hand, they said that their written reports were too extensive in many cases, which reduced the legibility. Furthermore, it was said that, if a page is turned, the information on that page had been 'forgotten'. That is, usually no one turns that page back again to view what was written down before; people only read the page they are working on. All respondents expected that the positive aspects of the paper records could be maintained and that the negative aspects could be improved by an EPR.

Inexperienced and the experienced users were not equally satisfied with the paper nursing records (Table 3). The inexperienced users were significantly more positive about the nursing record than experienced users. When we considered only those items related to data retrieval aspects of the paper record, the results showed that experienced respondents tended to judge the data retrieval aspects of the nursing record more negative, but the differences were not significant ($P = 0.069$). No differences existed for the medical record. A comparison between the satisfaction with data entry aspects of the medical record and those

of the nursing record the data showed no significant difference between experienced and inexperienced respondents. Similar results were found for the data retrieval aspects.

3.4. Knowledge about computers

Section three of the second questionnaire dealt with self-reported-knowledge about computers. Inexperienced users appeared to possess less knowledge of computers than those who considered themselves experienced computer users (mean: 1.5, S.D. 0.45, $n = 25$ vs. mean: 2.0, S.D. 0.40, $n = 16$; $P < 0.05$). Many of the inexperienced computer users were female nurses and also in the interviews mostly that group indicated that they expected the residents and the male nurses to be more experienced computer users than their female colleagues. Moreover, they were critical of the forthcoming changes in record keeping. Elder respondents did not know less or more about computers than younger respondents.

3.5. User needs and user expectations

Table 4 shows that ease of use, availability, speed and reliability were marked as important features. Overall, respondents did not expect health care to be negatively affected by computer applications. No significant difference existed between experienced and inexperienced respondents. Respondents expected that access to up-to-date knowledge in computer applications would positively influence health care (Table 4).

The second set of interviews zoomed in on several issues, directly related to consequences of an EPR on the daily work of the respondents. Respondents defined several improvements of an EPR in comparison to paper records: better legibility, more concise reporting, more overview and data entry required only once. Single data entry was thought to have two advantages: (1) no more copying of data; and (2) the patient not having to provide data over and over again.

None of the respondents expected the EPR to be a better means of communication than

Table 4
Overall results and results of several individual items concerning applications of computers in health care

Computers in health care	Experienced			Inexperienced		
	Mean	S.D.	*n*	Mean	S.D.	*n*
Desired functionality						
Not necessary to learn special codes	2.0	0.76	15	1.7	0.69	24
Accessibility	1.3	0.49	15	1.4	0.71	24
Speed of data retrieval	1.9	0.52	15	1.7	0.82	24
Reliability	1.3	0.62	15	1.3	0.71	23
Influence on health care	3.2	0.43	16	3.4	0.41	26
Quality of care	3.9	0.50	16	3.6	0.57	25
Interactions between care providers	3.4	0.73	16	3.6	0.86	25
Access to continuous education	3.6	0.73	16	3.7	0.74	26
Access to up-to-date knowledge	4.0	0.52	16	4.1	0.71	26

The scores of the desired functionality scale are 1 = vitally necessary, 2 = generally necessary, 3 = somewhat necessary, 4 = not necessary. The scores to measure the expected influence on health care 1 = absolutely negative to 5 = absolutely positive.

the paper records, nor did they expect different usage of the EPR. Only one—experienced—nurse expected the EPR in the end to result in a reduction of time spent on administrative tasks. One of the residents expected more search work, since a computer file does not show the number of pages already filled in. In a paper record, the number of pages was an indication of how many data were collected of that patient.

Neither managers, nor the users expected an EPR to greatly influence verbal and written reporting, either negatively or positively. They did only expect that the written report would become more concise and relevant. One of the nurses thought that maybe she would become more conscious of what needed to be reported and what not. The example she gave was the fact that a patient slept well need not be reported. If, however, a patient slept badly, this should be reported. Now, often either case is reported. Additionally, managers expected a practical problem in verbally reporting from a computer screen.

Most users did not expect their work routines to change drastically after changing to electronic record keeping. In their opinion, writing or typing does not make a difference; it will take more time initially. One nurse, however, mentioned that the reporting might change a lot, since she expected reading on a computer screen to be difficult. Furthermore, until now the nurses have had the routine to sit down together and write their reports at the same time and this may become difficult with a limited number of computers. Managers hoped for more efficient handling of information, although they were not sure of it. And, due to a more organised and structured record, reporting might become more uniform and clear.

The impact on patient care was expected to be limited. One of the managers thought that decision-making could improve, because the overview of data would improve with the EPR. Another one said to hope that an EPR could prevent that patients have to respond to the same questions over and over again with each new nurse or physician appearing. In addition, it was expected that only an EPR interacting with a reminder or protocol system would make a real difference in patient care.

Problems that were expected mainly related to communication aspects. The paper record for example, goes with the patient if (s)he has to go for an examination. In our project only one department was involved in the project and respondents expected difficulties to arise when no record could be sent with the patient and the examining doctor would not have access to the EPR.

In many cases the respondents appeared to have no idea of what to expect or they were very awaiting; "I will wait and see what happens …" was heard often in the interviews.

4. Discussion

The participation of health care workers in the development and implementation process of a system is said to be crucial for its success [16–19]. In addition, to prevent one single viewpoint on a system's requirements it is important to involve all user groups in the development phase [20]. Furthermore, the organisational aspects of health care work should be considered [17]. The choices we made during the development and implementation process were aimed at enhancing participation and social support of all groups. We measured the attitude of all potential users and their expectations of computer applications in daily work. We also assessed their opinions about advantages and disadvantages of the paper records in use at the department to be able to develop a tailor-made EPR. In addition, several users were closely involved in the actual development process of the EPR.

4.1. Background of the respondents

Many users considered themselves as inexperienced computer users. Therefore, emphasis on training was important. In addition, the EPR should be simple and easy to learn. Most of the inexperienced users appeared to be nurses, which has led to the decision to train all nurses individually.

4.2. Attitudes towards an EPR

Previous research indicates that years of professional experience, the profession of respondents and self-reported previous computer experience are predominant factors in accepting or rejecting information systems [9,11–14,21,22]. In our case we could only demonstrate that self-reported computer experience was related to the users' attitudes. Overall, the attitude of experienced computer users was more positive, but in general both experienced and inexperienced users appeared to be neither positive nor negative. The interviews following questionnaire one confirmed the earlier obtained results about the attitude of future users. At the same time the users were critical and curious. This critical attitude was an indication that we needed to involve our future users in the whole development process and to prepare them for the change. Only then they would gain insight in the possibilities of electronic record keeping and develop a sense of ownership of their EPR.

4.3. Satisfaction with paper records

The study of the IOM identified strengths, but many more shortcomings of paper records [1]. In a previous study by one of us, physicians assessed the data entry aspects of paper records positively, whereas data retrieval could be improved [2]. Also in our study, the users were more positive about the data entry aspects of both the paper medical and the paper nursing record than about the data retrieval aspects. Long before the EPR project started, the department itself started structuring the paper records and these paper records are still under continuous development. Thus, the paper records in the neurology department are more structured than usual. We expected this to facilitate the transition to electronic record keeping and to increase the user acceptance of an EPR, since applications that deviate too much from the intended users' daily practice are more likely to be rejected [23]. In the interviews, the respondents indicated that the ease of data entry made paper-based reports often more extensive than necessary. Consequently, tracing relevant information often became difficult. The respondents indicated that an EPR should give them more overview than the paper records and should release them from copying data from one sheet to the other. Therefore, in our EPR, we tried to incorporate the positive aspects of the paper records, defined by our future users. In fact, most of the respondents' wishes could be realised in the EPR [6,7].

4.4. User needs and expectations

Since experienced users had more knowledge of computers, one might expect that they may be more capable of judging possible consequences and potential effects of computer applications on daily routines. However, our results showed that both experienced and inexperienced users had little definite expectations regarding the effects of computer applications on health care. Accessibility and reliability were the only important aspects for our future users. These results lead to the conclusion that the future users had no clear view of what could be

expected after introducing computers into their daily work. Hence, we needed to increase the efforts to involve and inform the potential users. Rogers assigns change agents an important role in this process [24]. Change agents promote an innovation and can influence the opinion of others about a certain innovation, an EPR in this case. Our wish was that the key users would act as change agents in the group of users. However, we noticed that the key users did not sufficiently communicate the knowledge and information they obtained to their colleagues. In the project team we repeatedly stressed the importance of informing and consulting the future users. The developer also visited the department and frequently talked to different future users. The second set of interviews (3 months prior to the implementation) was an opportunity to evaluate our efforts. It appeared that the attitude and expectations had not been changed, since neither users nor managers had a clear view of the changes ahead. Both users and managers said to expect no major positive impact of electronic record keeping on daily practice, not in patient care and not in administrative tasks. Instead, they feared more time consuming reporting, and difficulties in communications with other departments. Yet, they expected more from an EPR with decision support, for example critical pathways.

5. First impressions of the EPR in daily practice

Currently, the implementation of the EPR is ongoing and so far no major problems have been reported. Users are reporting both in the EPR and in their paper records, but the number of nurses and physicians actually using the EPR is still limited. So far, the users have encountered several difficulties. The first

is the number of stroke patients. We started off with the main population of the department being the stroke patients. For unknown reasons, the number of stroke patients admitted to the neurology ward declined drastically in our research period, which means that users have much less opportunities to use the EPR than anticipated. A second issue is the decision to offer only an EPR, without decision support. Reason for this was the higher rate of complexity of such a system. In the interviews, however, managers said to expect much more from an EPR with decision support than the EPR alone. Nevertheless, they were very enthusiastic about the EPR itself. The impact on daily routines with only an EPR is less, but the direct advantage for the user is limited as well. This is exactly what we sense in the group of users. A third problem is the lack of links with other systems. These links could provide immediate advantages for the users if we think about electronic ordering of lab tests or medication. Adoption of an innovation depends on, among others, relative advantage, compatibility with existing values and experiences, complexity, ability to test the innovation, and the visibility of results [24]. For our key users the relative advantage and the visibility of results might have been too low to actively participate and communicate with colleagues. They themselves said to expect no clear advantages, but were assigned to a task. Yet, the key users' functioning is a key issue in a system's success [25]. On the one hand, our key users could have invested more time, while on the other hand they could have been encouraged more.

Introducing IT into an organisation means invoking changes and the extent to which the organisation, management and employees, are apt to change influences the rates of success [25]. While we expected that during the development phase users with a neutral

attitude would become interested in the EPR and its possibilities, this did not occur. Probably, we should have assessed readiness for change, before starting the development.

6. Conclusions

Involving the users is said to be important in the development process of an EPR. Initially, we considered the way we consulted the users, besides the project team, as sufficient. The users received two questionnaires about subjects that related to electronic record keeping and the subsequent changes in their daily work. We expected them to start thinking about the consequences of an EPR and maybe to become interested. However, after the development phase their opinions had not significantly been changed. Both at the start and at the end of the design process users seemed rather indifferent about the EPR. Whether or not we will succeed in successfully introducing and maintaining our innovation, we will discover in the formal evaluation study of the EPR for stroke patients.

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