

Electronic Patient Records: A technology supporting the clinical practice *

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Cover photo: The electronic Patient Record. (Reproduced from www.nurseweek.com)

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Abstract

This report studies medical documentation and the Electronic Patient Record technology. The technology is discussed as a technology that supports the clinical practice of the health professionals. Case studies and arguments from theoretical literature, primarily from the fields of Computer Supported Cooperative Work (CSCW) and Medical Informatics, serve to provide a broad treatment of the subject.

The studies identify multiple purposes for medical documentation. Both the local practice and external entities define requirements for documentation systems.

The study discusses a proposed national (Danish) standard for medical data. The standard defines a precise grammar for medical documentation the enabling sharing and processing of data, as well as, hyper-linking and referencing in between the medical descriptions, enabling easy reading of medical information.

Both the Electronic Patient Record system and the proposed national document standard rely on one specific medical practice (ie. work protocol). The findings of this study suggest that a medical documentation artifact must support at least two medical protocols, one with documentation preceding the intervention and one with the intervention preceding the documentation.

The study describes a medical documentation system as a system consisting of numerous documents besides from the official patient record. The total system uses both the electronic and the paper media. The design of the total documentation system must therefore support the integration of information across the two medias. Further more, the design of the official documentation system should acknowledge the existence of other locally defined systems.

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Chapter 1

Introduction

Much attention is focused on Electronic Patient Record (EPR) technologies. Large projects with the aim of implementing EPR system in Danish hospitals are currently running. (Bernstein et al., 2001) Similar projects are running in most other western countries. (Clayton and van Mulligen, 1997) Stories of the many possible benefits from the technology, a main one being a higher quality in the treatment of the patient, are reported by the media on a regular basis. A very important feature of the EPR technology is the fact that it is under development and therefore not yet defined. What should EPR systems look like and which informations should they contain? How can information from the different systems be integrated on a national level? These are questions which are not yet answered. Further more, because the technology is still in the process of being introduced into the hospitals, the role of the technology in the concrete clinical practices at the hospitals is not yet known. As well as, the changes to the work of doctors and nurses as a consequence of the introduction of EPR technology is still unknown.

This report will discuss EPR systems as systems which function in a medical practice. It will discuss the consequences of the EPR technology on the work practice, as well as, the requirements that the practice imposes on the technology. Subsequently, this report will also touch upon issues which are important to the ongoing process of defining the EPR technology.

Observations for this report were undertaken on a ward in a large Danish psychiatric hospital. The report will therefore primarily discuss the findings from this work place. However, it will also attempt to put them into a wider theoretical perspective and to discuss them in the light of other ongoing EPR projects.

This report is written within the framework of the field of Computer Supported Cooperative Work (CSCW). The aim of this field of study is to develop knowledge and technologies, which can support cooperative work (people working together on a task). This report understands medical work as a largely cooperative practice, where different health professionals are involved in the treatment of patients.

The Electronic Patient record is a tool, used by the health professionals to support and document their work. The EPR system and the other tools for documentation, such as the (paper based) Patient records and hand written notes, serve to support the clinical work at hospitals. Documentation tools, therefore, have to be integrated into the work practice and their design has to meet the requirements of the practice.

Hoegh-Nielsen (2002) writes in the internal Journal of the HS ¹ that “In order to receive the full benefits from the information technology, the clinicians must analyse the existing work procedures and define the new work procedures and thereby also define what an IT-system has to be able to do. They have to plan, how they want to implement the IT-system and how to use it in an appropriate way.” The quote is taken from an article, which discusses the implementation

¹HS is the name of the Hospital consortium for the greater Copenhagen area. Sct Hans Hospital, the hospital studied in the report, is a member of the hospital consortium.

of EPR systems within HS hospitals. The statement is very general in its description of the situation, but it points at an important problem. EPR systems have to be designed to fit into the work practices of the users. And secondly, the work practices (the organization of work) have to be altered, in order to integrate the EPR systems into them. This report will address this issue.

The process of implementing an EPR system is often characterized as the process of changing from a paper based system to an electronic system. However by using such a description one risks ignoring the problem described above. Sellen and Harper (2001) argue that this mistake is made in many *digitalization* projects. They found that in all of the cases studied in their book the main aim was to change the tools from paper based to electronic, the projects failed. This is also a potential pitfall for the EPR projects in the Danish hospitals. Instead, "Organizations need to look at the combination of people, artifacts, and processes to assess where problems may lie and how solutions can be implemented." (Sellen and Harper, 2001, g. 193) The documentation systems are just tools used to support the organization of work. And thus, an aim of transforming paper based tools into electronic ones is an aim, which does not touch the core of the problem. The aim should be to transform the organization of work, and as a consequence, change the tools which supports it.

Berg (1997) discusses the relation between the design of systems and practice as a mutually dependent one. He uses the term *convergence* to describe this relationship between the two. He argues that:

"there is no meaningful way to talk about a tool without at the same time speaking of the practice with which it coevolved: the research protocol is part and parcel of the network that is "current oncology." One cannot cut away either one or the other without losing sight of the constituent features of their current "essences." The "properties" of both tools and practice are in constant motion. And when nothing has remained the same, when tools and practices have become so thoroughly intertwined, blame or praise for a tool's fate cannot be distributed unequivocally. A story of heroes and villains has lost its ground. "the tool" or "the practice" can no longer serve as an explanatory category: an understanding of the current situation requires an understanding of the way these categories are intimately involved in each other's production." (Berg, 1997, pg. 164–165)

The relationship between the practice and the tools, one of them being the EPR system, is a complex one. When the two are mutually dependent, changes to one will have effects on the other, which will again affect the first one. An implementation of new tools into an organization will result in a need to change the present organization of work, to change routines and *standard operating procedures*. The other way around, changes in the organizations also result in changed requirements to the tools. Because organizations are continuously evolving, the tools will have to be continuously modified to meet the requirements of the organizations. The task of building EPR systems is, therefore a complex task. It is a task which has to deal with the complex relationship between the system and the practice. And it is a task which has no *final* end point.

The process of building Electronic Patient Record systems is further complicated by the fact that multiple purposes for the systems exist. Patient Records serve to document the treatment performed. The documents in a patient's record serves as evidence if problems during the course of treatment gives rise to law-suites. From a managerial view point, the patient record also documents the actual work conducted during a course of treatment and the resources applied to the tasks. An explicitly stated purpose of the EPR is the enabling of statistical operations on the data material in the EPR systems.(Bernstein et al., 2001) It is hoped that the implementation of EPR systems in the Danish health sector will enable statistical operations on data to further resource management and scientific research. At the same time, the patient records (the electronic ones included) serve as a support to the clinician doing the actual work. Information about the treatment is stored in the patient's records. The patient record serves as a *memory* for the doctor or nurse helping them to recall previous incidents. In modern medical practice, many different health professionals are involved in the treatment of the patients. The memory function of the patient record also supports the cooperation of these actors. Described in simplified terms,

the patient record enables a physician to see what others have done to the patient. Besides from the memory function, the record also serves as a planning tool. The clinicians write down plans for the treatment of patients, which are then guiding the work thereafter.

Some of these different purposes do not coexist without conflicts. For instance, the management's need for statistical information might result in a change in the documentation demands put on the clinicians, changes that do not benefit them in their work. This conflict is recognized in general within the theoretical field of CSCW. (Schmidt and Wagner, 2002b; Berg, 1999) A conflict between the *global* and the *local* exists in all cooperative work practices. The needs and requirements within a work group are not all the same as those from their surroundings. When implementing an EPR system conflicts between the global and the local have to be managed.

1.1 Problem statement

My problem statement consists of three related questions:

- What are the purposes of medical documentation?
- What are the consequences of implementing Electronic Patient Records for the organization of work and the practitioners?
- How should an EPR system be designed and consequently implemented in the organization?

It is important to define the purpose of medical documentation. The Electronic Patient Record is a part of the medical documentation and as such, it serves the same purpose. A definition of its purpose consists of a description of the *global* purposes, as well as an uncovering of the role which documentation plays in supporting the clinical practice. The second question addresses the changes which the implementation of electronic documentation systems impose on the organization. The report will discuss medical work and the electronic patient record's effect on it, positive, as well as, negative. The answers to the two first questions enables a discussion of the third question. This question addresses the *design* of both systems and organizations. How should systems be designed, in order to support the work practice and how should work be organized in order to utilize the benefits of the system.

It is important to mention that the above questions should not be understood as questions, which demand exhaustive answers. I will not be able to include and discuss all purposes of medical documentation. In the same way, the discussion of system and organizational design is not intended to be a complete *designer's manual*. I will instead limit myself to discussing aspects and problems that have appeared as *particularly important* during my studies.

The questions will be answered using data material collected during observation at a ward in a large Danish psychiatric hospital. Concrete examples of medical practice are, thus, examples collected at this ward. More *general* material and theory has also found its way into this report. This material falls into three categories: Descriptions of design and principles of EPR systems, descriptions of medical documentation practice and principles, and finally, general/theoretical computer science literature. Literature from the last category has primarily been found within the CSCW field of research. This report, thus, tries to include both concrete examples as well as the more general statements.

Chapter 2 presents an overall view of the hospital, the ward, its staff and its patients will be presented. The work activities and mechanisms for coordinating these will also be presented to the reader.

Chapter 3 presents illustrative examples of the treatment conducted on ward M6. These will serve to provide the reader with an understanding of the work conducted on the ward. In particular, the section will stress the coordinative efforts the staff and patients invest in coordinating the work.

Chapter 4 introduces the reader to the documentation work conducted at the ward. The different documents used (being written and read) on the ward will be presented along with a description of the EPR system used by the staff.

Chapter 5 discusses medical documentation and the electronic patient record from a wider perspective. The historical development of medical documentation and electronic hospital information systems will be summed up and design principles of a contemporary system will be described. This section primarily serves to define the global purposes of EPR systems.

Chapter 6 discusses the relation between the many documents, which make up the total documentation produced about the patients. The fact that many different documents are used at the same time and that they are related to each other² gives rise to a discussion of information integration across documents and media. The need for explicitly linking of information, as well as, the ability of electronic systems to support this is discussed. And secondly, the integration of information in both paper-based and electronic media is discussed.

Chapter 7 discusses the relation between planning and practice. The EPR system is discussed as an artifact that serves the function of documenting the clinical practice, as well, as being a planning tool for the clinicians.

Chapter 8 further discusses the articulation work that takes place on the observed ward. This discussion leads to conclusions on the roles of artifacts, paper-based and electronic, in supporting the coordination of work.

Before the argumentation is unleashed, a few notions have to be mentioned.

The EPR system is only one artifact out of many used by the staff in their work with the patients. The EPR system is the focus of this study. However, the documentation work conducted by the staff and, as we will see later on, also by the patients, will be treated as a whole and the EPR system will be treated as a part of this.

The term *documentation work* is used in literature (Nurses at Sct. Hans Hospital, Nursing department, 2001; Ministry of health, 2001) and in the way in which the staff talk about the writing of documents as part of their work. Two different kinds of work can be distinguished, documentation work and clinical work (treatment work). The two types together make up the total work conducted by the staff. The two are related in several ways. The two are focused on the same subject (the patient and the treatment of him/her). Documentation work serves to coordinate the treatment work. But the two are separate entities. The fact that the documentation also serves a legal purpose is something that distinguishes documentation work as a separate entity.

The distinguishing features between documentation work and the treatment conducted is a central focus point in this report. This report focuses on the documentation work. The actual treatment conducted by the staff members is treated as secondary to the documentation. From the view point of the Health Professionals the relationship between the two is obviously the other way around. There are two main reasons for my focus on the documentation work. Firstly, the focus of this report is the EPR system which is the main artifact used in the documentation work. But equally important, the distinction has to be made so that this report does not attempt to answer questions that are essentially clinical ones. In other words: The field of Computer Science might be able to build systems, which can handle medical information. But it is essentially up to the clinicians to decide, *what goes into the systems*. I am not capable of judging the treatment or to make suggestions as to how the treatment can be reorganized and improved.

The observations and interviews conducted during this project have been concentrated around the staff. I spent the entire time in the nurse's office on the ward. I have not had any direct contact with the patients and I have not directly observed the treatment and therapies referred to in this paper. My descriptions are based primarily on the staff's accounts along with the documentation produced on the patients.

I have mainly concentrated on the nursing part of the total clinical practice. My knowledge of the psychiatrists' practice comes from my observation at the conferences, as well as shorter

²Documents can concern the same patient, the same course of treatment, the same staff member, etc.

unstructured interviews with psychiatrists at the nurses office on ward M6³ I have not been able to observe the psychiatrists when they performed their work tasks. For instance, when they dictated their treatment plans after the conference meetings, or when they performed other documentation activities in their offices.

This distinction between the nurses and the psychiatrists is also visible within the literature. Particularly in the field of Medical informatics, a distinction between Nursing Informatics and Medical Informatics (the physicians' documentation) exists. (see (Tang and McDonald, 2000; Ozbolt and Bakken, 2000; van Ginneken and Moorman, 1997; Grobe et al., 1997)) However, this distinction is not a clear one. As we will see in this report, both types of documentation are related to each other in the SHH EPR system. In the CSCW literature, the distinction does not seem so clear either. (see (Berg, 1999)).

Finally, the nature of medical information deserves to be mentioned. The medical field is a wide one, with many different specialities. The information documented within these specialities differs considerably. The medical domain studied in Berg (1999) is intensive care. The information in this field largely consists of numerical data, such as blood pressure or the blood oxygen level. In the field of Psychiatry, medical documents tend to consist of longer textual descriptions of the patients' behaviour. The varieties in medical information has two consequences for my work. Firstly, arguments in literature can not be used without considering the domain to which they belong. Secondly, this means that the arguments of this report are limited to certain domains.

The observations ran over a period of three months during the summer of 2002. A total of ten full day shifts were spent on the ward. During the period I attended several conference meetings and other staff meetings. I talked to the nurses on the ward, the two affiliated Psychiatrists, a social worker and physical trainer. I have had two meetings with the EPR coordinator, who is responsible for managing the EPR system. I have also conducted unstructured interviews with a nurse responsible for the clinical development on the ward. Further more, I attended a Nursing Documentation seminar held by the Clinical nurse.

³Usually when the psychiatrists were there before, under, and after conferences, or when they were there to see patients.

Chapter 2

The case example

Sct Hans Hospital (**SHH**) is an old hospital. It has a 200 year long history as a psychiatric treatment facility. However dated as far back as the 14th. century, it has been used as a “storage facility for *the insane*, plague infected, the poor, and other unwanted members of society. The hospital is placed in Roskilde some 40 kilometers outside of the nations capital; Copenhagen. It has throughout the history been operated from the capital and used by the people of Copenhagen. Through time, and over the changing view on mental illness, it has functioned both as a storage facility with a *safe* distance from the city and as sanctuary for the ill people of the city. Hospitalization at SHH gave patients a supposedly beneficial change of environment, fresh air and nature.

In present time SHH is a large psychiatric hospital with a capacity of approximately 500 patients. The hospital is part of a group of hospitals run by the “greater Copenhagen County” (called HS; danish abbreviation for The capital’s hospital cooperative.) As a hospital in a group, SHH serves a specialized function. SHH does not receive patients “from the street”. Patients are admitted to other hospitals, and from there, they are transferred to SHH. Patients usually spend a longer period of time at SHH. A formal purpose and plan is described prior to patients’ transfer to SHH. As such, SHH should be viewed as a “special resource” used on patients that are believed to benefit from the treatment at SHH¹

The hospital treats patients with different categories of illnesses. The hospital is organized into four different specialties dealing with each their types of patients. These specialties are:

Department M focuses on treating patients suffering form substance abuse problems and organic brain damages (Usually, brain damages caused by longer periods of alcohol or drug abuse.) Many patients at the M department are characterized by having *dual diagnosis*; a dependency of some stimulant accompanied with psychiatric diagnose, such as, depression or schizophrenia. The studies undertaken in this report are all done at a ward belonging to the M department.

Department P Treats patients with chronic psychosis.

Department R focuses on patients, who are sentenced to receive psychiatric care and treatment.

Department U is specialized in treating young schizophrenic patients.

Each department has a number of wards, each specialized to handle certain patient types and working with special methods and principles. The M department consist of 11 separate wards named “M1” and on to “M11”. I have only studied work at one of the wards; namely M6.

The M6 ward Will be presented under the following section, as part of the presentation I will also shortly touch on the relations and differences between the M wards.

¹SHH’s homepage describes many basic facts about the hospital; see www.scthanshospital.dk

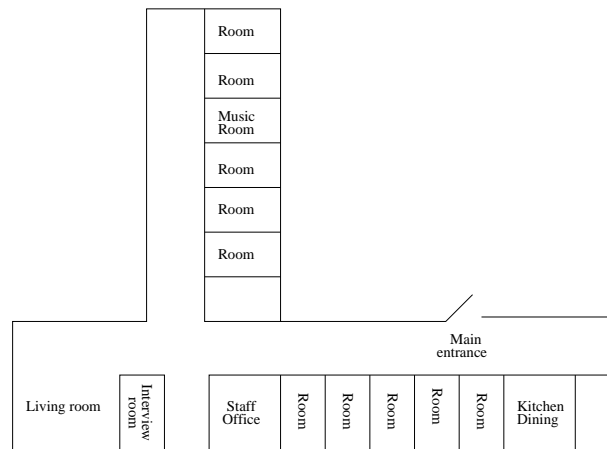


Figure 2.1: Overview of ward M6

2.1 Ward M6

Ward M6 treats patient, who are characterized by having dual diagnosis. This means that all patients are addicted to stimulants, such as, alcohol or drugs, and at the same time they have some other diagnose. The patients on M6 are seen as *stronger* patients, who are expected to be able to work constructively with their problems. *Weaker* patients are placed at other wards, which enables a very effective and concentrated treatment at M6. Figure 2.1 shows the layout of ward M6.

The ward has a capacity to treat 20 patients at the same time. All available places are usually filled. Patients usually stay on the ward from three to six months, but treatments running over a period of a year are not uncommon either.

The majority of the patients are between 30 and 40 years of age. Both men and women are treated on the ward. The ration between the sexes change as a result of the referrals to the ward, but an even ration is aimed for. The patients stay in little rooms in pairs (of same sex). The rooms are physically placed in two hallways connected to a common living room area.

The *private session room* is also shown in the figure. The private session room is used when talks require discretion and privacy. The room is used for talks between contact nurse and patient or patient and psychiatrist. It is also used when talks between staff members requires discretion. Occasionally, the room also serves as an extra, temporary, room for patients.

The ward also uses a gym, physically placed on the second floor on top of the ward. Physical exercises take place at the gym.

The patients take turns in kitchen work groups, where they are responsible for preparing food and cleaning after meals. The patient food is prepared at the SHH central kitchen, but the patients at are responsible for arranging it on the tables. Occasionally, meals are also prepared by a group of patients, with or without staff assistance. Cooking sessions are planned and the deliverance of the pre-made food is canceled. The patient kitchen and dining room is also shown in figure 2.1.

The patients are responsible for cleaning and tidying up in their rooms. The state of their rooms are formally inspected every Friday afternoon. A cleaning assistant is responsible for cleaning the common areas and for washing the floors in the patient rooms.

Patients are referred to SHH from other hospitals ² *Visitations* are held to determine Whether

²Patients are occasionally readmitted to M6 directly from their homes. This sometimes happens in cases, where the treatment is ended, but where a need for continuing the treatment is detected after the patients has left the ward.

they are thought to benefit from the treatments available on ward M6. Visitation meetings are held weekly at the M section, where the head nurses from the M wards, the psychiatrist, and the clinical management of the M section discuss the referred patients. At these meetings it is discussed whether a patient will benefit from the treatment and which of the M wards they will be placed on. Goals are set for the treatment at the ward, and plans are made for the patients' *life* after the stay at SHH. After having been discussed at the visitation meeting, the patient is put on the waiting lists for the wards. Thus, plans are made for each patient admitted to M6. What are the aims of the treatment. Where will the patient go after a successfully, as well as unsuccessfully, ended treatment.

There are 12 staff members assigned to perform the care at M6. Most of them are nurses.³ I will refer to the staff members as nurses in this report.

The ward is manned 24 hours a day, divided into three shifts; a day shift running from 8 am to 4 pm; an evening shift running from 4 pm to 12 pm; and a night shift running from 12 to 8 am. Three to five nurses are at work in day shifts depending on patient needs and available staff. Two people are assigned to the evening shift. One nurse is assigned to the night shift. Many of the patients spend their weekends at their homes away from the ward. The ward might therefore be operated with a reduced staff or in some cases, the ward might be closed down from Friday afternoon until Sunday afternoon.

As the description of the work schedule suggests, the control of work resources at M6 is very flexible and characterized by an *ad hoc nature*. Work plans are made ahead of time, but many changes are made to them. Staff members might be called into work on a relative short notice or they might leave early and skip shifts, when they are not needed. A general guideline for the work planning of M6 is, that staff members only work certain preferred shifts. Some staff members primarily do day shifts, while others might prefer evening and/or night shifts.

Besides from the nursing staff, other professional groups are also engaged in the treatment of the patients. Two psychiatrists are usually assigned to treating the patients at the ward. A specialist in physical training and motor system is assigned to treat the physical problems of the patient. A social worker is assigned to all of the ward's patients, responsible for helping the patients with social and economical matters.

Figure 2.2 shows the staff office at M6. A large meeting table is placed in the center of the room, and this is where staff meetings and conferences take place. Paper work, including computerized "paperwork", is usually done at the table in the upper right corner.

Medicine is kept in a large board. From this board drugs are administered to the patients. A tray with the patients' medicine is filled prior to the three main meals, which is distributed in the kitchen. Medicine to individual patients is administered straight from the board.

Many different types of documents are placed in shelving units in the office. The staff members have drawers, in which, they can store private and work related things. Different manuals and forms are stored in the shelving unit in the top of the figure. The shelving unit contains different hospital and administrative manuals and different paper forms used by the staff and patients at M6. (The staff make use of a number of different paper forms in their treatment of patients and the coordination of work at the ward. I will discuss the forms later in this paper.)

Paper based records are written on the patients along with the records in the EPR system. The paper journals are placed in a filing compartment next to the medicine board. *Psychiatrist contact binders* are also stored in the filing compartment. In these note books, nurses write down notes on patient problems, notes that are read later on by the psychiatrist during her rounds. Test results, not included in the EPR system, are also stored in this binder when they arrive at M6. The psychiatrist receives tests in this binder and files them in the patient's journal or elsewhere.

The staff at M6 have access to four computers. Two desktop computers are placed on the desk in the top left corner of the figure. These two computers are mainly used for writing patient

³One staff member, is a "social and health assistant"; a two year health education. Another staff member is a "social Pedagogue.

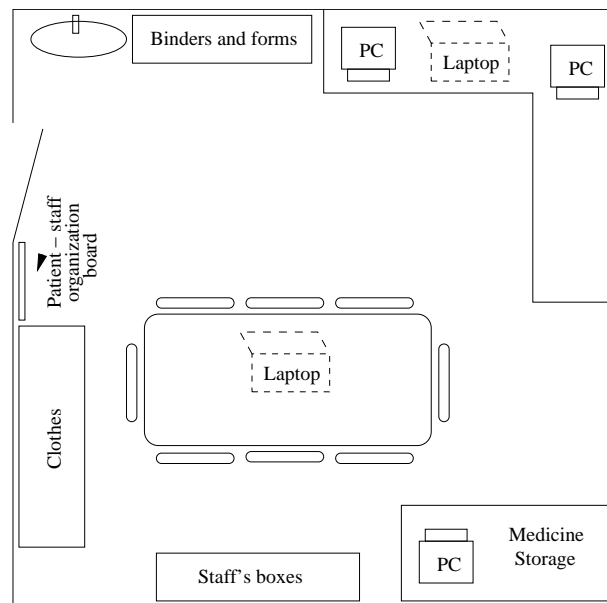


Figure 2.2: The staff office at ward M6

records and other documents. Each computer has a color printer attached to them. A third desktop computer is placed inside the medicine compartment. This computer is mainly used to register the drugs given to the patients. This computer also has a printer attached used to print out *medicine lists* on. A laptop computer with a cordless LAN connection is also used in the office. The laptop computer is used by the psychiatrist to browse through EPR documents during the conferences. The laptop is occasionally used to write patient records on, and the cordless LAN connection makes it possible for the nurses to use the laptop in the interview room or other places on the ward (in sessions when working with patients).

The staff use a number of difference programs installed on the computers. The staff has access to a number of informations on a hospital network, such as, an on-line phone-book and on-line documents posted in a Lotus Documents Management System. The Head nurse and the assistant head nurse have e-mail accounts and communicates with other people at the hospital. Many different forms are use in the work. These forms are made and revised using a MS Word word-processor and the color printers. As noted, the staff uses an EPR system to write patient notes and documents on. The computers also give access to a hospital management system; the *Green System*.⁴ The nurses at M6 use the system to order drugs from the pharmacy.

2.2 The work at M6

Three main categories of treatments are performed at ward M6:

Cognitive therapy: The M section and particularly ward M6 work out of cognitive principles.

Cognitive oriented work focuses on peoples way of thinking, hence the name cognitive or cognition. The aim is to identify and modify *wrong* thinking and reasoning. A common cognitive problem description is low *self esteem*. People with a low self esteem might falsely devalue their capabilities and qualities. Cognitive oriented interventions would then be aimed at identifying the *devaluing* and try to change the reasoning to be more

⁴The Green system hospital information and management system, used in many hospitals in Denmark. It is named after its characteristic green on black shell interface.

realistic and positive. Cognitive work and therapy takes place in the day to day relations between patients and nurses (and other staff members), but it is also performed under formal settings (eg. in the cognitive groups).

Medical treatment: Most of the patients are treated with different types of medicine. All alcohol addicted patients are given “Antabus”, to prevent them from drinking during their stay at M6. As stated earlier, many patients at M6 have other psychiatric problems, which are treated parallel with the addiction. Patients can have anxieties or hallucinations (psychotic patients), which are being treated with medicine. Medical treatment of a patient is a process of adjusting medical doses and observing for changes in the behavior. In most cases doses have to be experimented with, to relieve the patient from his or her symptoms, and in some cases different related drugs have to be tried out, in order to find the *right drug*.

Social psychiatric work: A large part of psychiatric nursing work falls under the category of social psychiatric therapy.⁵ Social psychiatric therapy can be described as training of social and every day skills. Psychiatric patients (often) need help to perform daily tasks, such as, personal hygiene, cleaning, shopping, or paying bills. One of the primary tasks of a psychiatric nurse is therefore to train the patient in handling the tasks and requirement of “normal life”. The social workers play a prominent role in this work as well.

Other types of treatments are also performed at M6. Many of the patients have different physical problems in addition to their primary problems. For this reason a *sports therapist* is assigned to the ward. Patients might also have other physical problems which require treatment from specialists out side of SHH.⁶ In these cases, the nurses and/or psychiatrists are responsible for referring the patients and providing the contact to the external institution.

The patient can participate in different activities and therapies placed in other sections at SHH. The patients might also attend individual therapy sessions with the hospital’s psychologists or psychiatrists

The activities at M6 run in weekly routines. Many activities take place throughout a week and most of the activities are planned. Figure 2.1 is a copy of the official weekly plan of activities, a paper given to the patients upon arrival at the ward. *Ad hoc* talks and sessions between staff members and patients are activities not included on the plan. There are no planned activities in the evening and night shifts. Here time is primarily spend on patient – nurse talks, as well as, reading and writing of patient records.

Musical activities are an important part of the treatment offered at M6. Two times a week the staff and patients engage in running (and walking) activities. This is followed by a sessions of “Afsændings therapy” led by the physical trainer. The staff at M6 believe that physical activity is a part of a healthy life. They also believe that patients will benefit from working with their bodies and physical capabilities.

Another big activity in the plan are the two cognitive groups. Most of the patient are connected to one of the two cognitive groups. They meet once a week, and engage in group therapy. Four nurses are attached to the two cognitive groups. The cognitive groups are a unique feature of M6. Patients at other wards tend to go to therapeutic sessions outside of their wards. Cognitive groups will be discussed further later in this report.

Occasionally, nurses or other staff members will lead formal teaching sessions. Typical subjects for these sessions are, strategies and methods for handling withdrawal symptoms. Informing patients about effects and handling of medicine is another possible subject in the teaching sessions.

⁵The nurses on M6 refer to social psychiatric work or therapy as large and important part of their work.

⁶SHH has a number of physicians, such as, gynecologists and gerontologists physically placed on the hospital premises. But in many cases, such as, when the patient needs his x-ray taken, he is referred to other hospitals to get the necessary treatment.

Time	Monday	Tuesday	Wednesday	Thursday	Friday
8:00–8:30	Report staff Breakfast & Medicine	Report staff Breakfast & Medicine	Report staff Breakfast & Medicine	Report staff Breakfast & Medicine	Report staff Breakfast & Medicine
8:45–9:00	Morning meeting	Morning meeting	Morning meeting	Morning meeting	Morning meeting
10:00	Activities Psychiatrist and contact nurse talks	Running	Activities Psychiatrist and contact nurse talks	Running	Conference 10:00–11:45
11:00		Relaxation		Relaxation	
12:00	Lunch & Medicine	Lunch & Medicine	Lunch & Medicine	Lunch & Medicine	Lunch & Medicine
12:30	Staff meeting	Staff meeting	Staff meeting	Staff meeting	Staff meeting
13:00	Patient education	Cognitive group (red group) 13:00–14:45 <i>or</i> Individual and other activities		Cognitive group (green group) 13:00–14:45 <i>or</i> Individual and other activities	Weekly meeting (staff and patients) 13:00–14:00
14:00			Individual and other activities		Talks with patient's relative & kin 14:00–15:00
15:30–16:00	Report	Report	Report	Report	Report

Table 2.1: The plan showing the weekly activities at ward M6.

Much time and energy is spent coordinating the work on the ward. The nurses engage in meeting activities with the other staff members on the ward, as well as, the other clinicians that are involved in the treatment of the patients. Four formal coordinating activities can be identified (See figure 2.1):

The reports: Reports are held between the three shifts. The main purpose of the report is for the staff finishing a shift to hand over important information to the staff members starting. The week plan shows two reports, one from the beginning, and one from the end of the shifts. During the first report, a nurse is appointed to lead the next report. Typical subjects of reports are: information about important incidents and changes to the patients state of health, and reminders of upcoming events and appointments.

The ward meetings: These meetings are in Danish called *opsamlingsmøder*, which can be translated into meetings on collected issues. The meetings are quite unstructured and informal, with no formal agenda. Rather, as the Danish term suggests, they are unstructured meetings, where the staff can discuss the issue they find important at that particular moment. The ward meetings are held twice in the day shift. Typical subjects are: coordination of joint activities, such as the closing of the ward on a Friday afternoon; sharing of opinions on incidents. (A nurse might have experienced a problem, while working with her patients. Alternative approaches and interpretations can then be discussed at the ward meetings.)

The conference: Once a week, a formal conference is held on the ward. The nurses, psychiatrists, and some of the other hospital's clinicians attend these meetings where the patients and their treatment is discussed. Usually, four patients are scheduled to be discussed at each meeting. The purpose of the conference is to coordinate the treatments of the patients, which the different groups of health professionals are involved in, and to define a *plan of treatment*.

Visitation meetings: The visitation meetings are held once a week. The primary objective of the meetings are to assess the patients prior to their arrival at SHH. Two questions have to be answered: Is the patient eligible to be admitted to SHH? And if so, which of the M wards should he or she be admitted to? Thus, the visitation meetings serve to coordinate the work of M section. Attending the meetings are: the head nurses of each of the M wards along with the *clinical responsible* psychiatrists⁷ at the M section. The visitation meetings will not be dealt with in this paper.

This was only intended to be a short presentation of the formal coordinating activities. They will be discussed in detail and in a more theoretical context later on in this report. Not included on the week plan are all of the informal work tasks engaged in by the staff members. Staff members have talks with patients, as well as each other, and they arrange *ad hoc* teaching sessions, whenever they see the need for them. According to the nurses at M6, much of the work they do with their patients is in fact unplanned, which allows them to follow the situational needs of the patient or others in the field of practice.

2.3 The organization of work

All M wards are characterized by treating patients who suffer from addiction problems. All patients are addicted to some sort of drugs. This might be medicine, alcohol, hash, or some other substance. Many patients have a *double diagnosis*, meaning that the patient has an addiction problem and then one or more other more traditional psychiatric problems. The two diagnoses might be related. Patients with a long history of addiction to drugs, can develop anxiety reactions. This is believed to be a consequence of the drugs and the lifestyle accompanying the addiction. The relation between addiction and mental problem can also be determined in the other direction. Mental problems such as depressions are often associated with alcohol abuse. It is believed that

⁷Psychiatrists working at the managerial department of the M section.

the symptoms, the sadness and lowered self esteem, which the patients experiences, stipulates the drug abuse and addiction.

At the M6 ward, the addiction is targeted in the therapy. The other problems of the patient, are viewed as factors in the addictive behavior and are therefore seen as factors which reinforce the addictive behavior. For example, a patient might be experiencing anxiety attacks, relieving these attacks will increase the chance of the patient being able to free himself from the addiction⁸. The other problems are therefore also targeted in the treatment but always as secondary to the addiction.

The patients of the M section are very different, and thus, they require very different approaches in the treatment of their illnesses. A division of labor exists between the different M wards in order to handle this big variety in the patients. The M6 ward is a part of this system of related wards.

There are two dimensions in the division of labor:

1. Patients are grouped into different categories according to the type of problems they have.
2. Patients are placed in wards according to the degree of severeness of their problems.

The first dimension enables the ward to have a specialty and focus in their work, thereby strengthening the quality of their work. By narrowing the field, the staff can reach higher levels of expertise and knowledge, which they can apply in their work. And by combining the wards, the M section can cover the great variety of patient types. The second dimension helps the ward hold a high level of effectiveness in their treatment. Patients with more severe problems are separated from the ones with lighter degrees of illnesses. As it was the case with different illnesses, different degrees in illnesses also require different methods in the approach to treat them. Again here, the division allows the staff on a ward to focus on certain treatment principles, and equally important they are able to maintain an ideal level of efficiency by relocating patients that do not fit into the scope of the ward. Following description of a selection of M wards illustrates the two principles:

M3 is a ward, in which the patients have similar problems compared to M6. M3 can be labeled as an entry ward. Typical patients are admitted into M3, and then transferred to M6 or another M ward, once they are in a better state of health. In some cases, patients are also transferred the other way if their state of health deteriorates. The lower state of patient's health means, that the treatment and therapy provided on M3 is less intense, than on M6. A primary function of M3 is *detoxifying* entry patients.

M6 is the ward discussed in this report. The patients here are characterized by a more stable state of health. A nurse at M6 characterized the patients as "better and more capable of working with themselves and their problems".

M9 is a ward focused on treating patients with *non-progressive* brain damages.⁹ The patients on M9 have lowered cognitive abilities, and thus, they can not participate in and gain from the cognitive therapies practiced on the other wards. The treatment and therapies are adapted to fit the needs of this type of patients.

M5 is a more *traditional* drug rehabilitation ward. The patients here are traditional drug addicts without severe psychiatric diagnosis as in the case of the patients at M6. When first placed in a ward M5, patients are usually not transferred to M6 (This goes for the other way as well). The relationship between M5 and M6 can, thus, be viewed as a division of labor according to the first dimension.

M2 focuses on day time therapy programs. Ward M2 offers a possibility for the treated patient to receive support in an extended time after an ended period of full time hospitalization. As such, M2 can be viewed as the last link in a line of wards treating patients according to the degrees of their illnesses.

⁸Interview with a nurse on M6

⁹As noted earlier, drug and alcohol abuse can lead to permanent brain damages. One of the best known types is *Korsakov's syndrome*, which refers to a brain damage resulting in an impaired short-term memory seen in patients with a long term alcohol abuse.

M6 is a unique ward in that they can refuse patients assigned to them. Most other wards do not have this option. After patients are accepted at the visitation meeting, and before they are admitted to M6, patients are interviewed by the staff at M6. The purpose of this interview is to discuss the patient's problems, goals, and motivation. It is important to verify that the patient *really* is motivated for working with his or her problems. From time to time, a patient, first assigned to M6, is refused after the *admittance* interview. This is a very important organizational feature, which enables a very high effective treatment at M6.

Patients are being placed in a ward at the visitation meeting prior to the arrival at SHH, as mentioned earlier. At the visitation meeting a plan for the patient's stay at SHH is made. This plan might specify planned transfers between M wards during the course of hospitalization. But the original plan might be changed, if it does not hold, or if the state of the patient has changed during the course of treatment. Following example, taken from the debate at a conference, illustrates this:

The psychiatrist suspects that the patient is brain damaged (alcohol related dementia) and would, therefore, like to have the patient tested for a possible brain damage. Dementia can be positively diagnosed and, have a dramatic influence on the course of treatment. If diagnosed positively, the patient will be moved from M6 to ward M3.

The arguments above, show how many different aspects attribute to the coordination of work between the M wards. Much work is being done, both in managing the layout of and patient flow through the M wards, as well as, the ongoing work of placing patients according to their needs. This ensures the *right* treatment for the individual patient, as well as, an optimal use of hospital resources.

Work is also organized internally at M6. The ward has a head nurse and an assistant head nurse responsible for managing the activities on the ward. They are responsible for planning the work schedule, and they are responsible for making sure that the ward meets its budget. They participate in the visitation meetings and the coordination of when patients are to enter and leave the ward.

According to the head nurse, a lot of time is spent on coordination activities. Examples of these are: ordering meals from the central kitchen, ordering medicine from the pharmacy, doing the paperwork, or coordinating with other offices when patients are released from or admitted to the ward. Only "closed" wards have secretaries assigned to them. Instead M6 has defined an *office duty* which is assigned to one of the nurses at the morning reports. The nurse responsible for the office stays in the office throughout the day. She is responsible for answering the phone, administering medicine, and all the other tasks, which are part of a normal day.

The clinical work is arranged after several different principles and divided between different actors. As mentioned earlier different professional groups are involved in the treatment of a patient; where nurses, psychiatrists, social workers, and physical specialists are the most central.¹⁰ Table 2.2 illustrates how the clinical work is arranged at M6. The table is made up with fictitious names, but it is a copy of a white board placed in the staff office. On this white board nurses write the patients, assigned nurses, and psychiatrists. The board makes it possible for staff members to get information on patients and assigned clinicians *at a glance*.

The board has the date of the patient's arrival listed along side of their names. The date of arrival is often used as a guideline, when making plans at the conference. The nurses or psychiatrist will often look at the board and say: "Are we done collecting information about the patient?... He has been here since... It is time to make some plans for the patient" or "the patient has been here since... He should be out of here before...".

All patients have a nurse assigned to them as the primary contact to the staff. In the Danish nursing tradition, this nurse is titled the *contact person*, and I will use the same term in this report. The contact person is responsible for the care of the patient. She conducts the interviews

¹⁰At least in this case study on M6. There might be different professionals in the key roles at other wards.

Arrival	Patient	Nurse	psychiatrist
	Green Team: Nigel Nina Stephen Jill...		
	Green Cognitive Group: Nigel Jill		
03-07-2002	Gina	Jill	Anne
06-14-2002	Jane	Stephen	Thomas
07-18-2002	<i>Michael</i>	Stephen	Anne
...
	Red Team: Rob Rosie Winnie John...		
	Red Cognitive Group: John Rosie		
11-20-2001	<i>Joanne</i>	Rob	Thomas
03-25-2002	Jimmy	Winnie	Thomas
05-10-2002	Kyle	Rosie	Anne
...

Table 2.2: The the board listing patients, the assigned contact person (nurse) and psychiatrist. Patients are grouped into two “cognitive groups.”

and private therapy sessions with the patient. Likewise, patients are urged, if possible, to come to the contact person when they want to talk or when they need help from the staff. The contact person arrangement also helps nurses to *be more aware* of the patients’ needs, and thereby, to be able to provide the needed care.¹¹ Without this arrangement, the nurses would have difficulties remembering all of the details about each of the patients. According to a nurse, the nurses will often refer a patient to his or her contact person, when the patient’s questions are not routine or common knowledge.

Group therapy sessions are held on the ward. The therapy follows *Cognitive principals*, which will be described further in section 3.1. The in-ward therapy sessions are unique to M6. On the other wards, therapy takes place outside of the ward, and is lead by external staff. The in-ward therapy work is the prime reason, why the M6 staff can refuse patients, as well as, dismiss them short of ended treatment, as noted earlier. The staff have to ensure that work in the cognitive groups is optimal.

There are two *cognitive groups* which the patients are divided into: the red and the green group. Table 2.2 shows how the patients are listed under a group. Two nurses are assigned to each group.¹² Some patients are not assigned to a cognitive group (These are written with italic fonts in table 2.2. On the real board, such patients are written using a blue pen.). Patients do not enter the cognitive groups right after their arrival, and in the final part of their stay on M6, patients are usually dismissed from the groups.

The nurses are divided into two teams; a red and a green team. The head, and the assistant head nurse are also included in the teams, one in each of the groups. Thus, a team consists of half of the nurses at M6. All of the team members are assigned to the patients as contact persons, and two of the team members are further responsible for running the cognitive groups.

It is difficult for the nurses to get to know all of the patients *well* at the ward. A detailed knowledge of the patients state of health, social situation, and the ongoing treatment is necessary, in order for the nurse to be able to treat and advice the patient. The division of patients and nurses into two team means, cognitive groups, and the contact person system reduces the number of patients, that a nurse has to know in detail. Likewise, the patient will primarily deal

¹¹Having a full view over the patients state of heath. Being able to successfully help the patient handling his or her appointments and plans

¹²By the end of my studies, three staff members, including one of the wards psychiatrists, where assigned to each group

with his or her contact person (or the staff member responsible for the cognitive group, if the matter relates to the group). If the contact person is not available, the patient will deal with one of the members of his or her team. The nurses, from another team, will usually refer the patients to their contact person or nurses from their team, if the matter is more complicated than a routine thing, such as, answering a general question or writing an appointment into the calendar. These two arrangements serve to ensure, that the relations between staff and patient are fewer but at the same time deeper.

A psychiatrist is assigned to each of the patients. The psychiatrists have split the patients between them. The system of their assignment does not follow the division described by the team system.

Chapter 3

Medical work

This section will introduce some theoretical terms relevant for understanding medical work and cooperative work. As well, some representative examples of the work conducted at ward M6 will be presented. The examples will focus on the cooperative aspects of the work. A description of the treatment work conducted is relevant in that it defines what the documentation artifacts have to support.

Medical work is cooperative work. Many different professionals work together on treating the patients. Strauss et al. (1985) argues that the advancements in medical and technical capabilities has led to a specialization of the medical professionals, thus, the treatment of patients requires the cooperation of several different specialities. The development has also resulted in larger and more complex organizational structures in the hospitals and the health sector in general. This development has led to an increasing need for coordinating the efforts of the many actors involved in the treatment of the patients. Berg (1997) argues that medical work is distributed among many different actors. And as a result of this, there is no central point for medical decisions. Controlling the course of the treatment is, thus, a result of the collaborative efforts of the actors involved in the treatments. The many actors involved in the treatment are all responsible for each their part of the total work conducted.

Schmidt (1994, pg. 7) defines *Cooperative work* as the situation where “multiple people that are mutually dependent in their work and therefore required to coordinate and integrate their individual activities.” This definition stresses that the people cooperating are dependent of each other, that is, they can not do their job without help from the others¹. Because they are mutually dependent on each other, they have to coordinate their work efforts. This coordination of the cooperative work is the focus of much work within the field of CSCW (See Schmidt and Bannon 1992 for an introduction to the areas of interest in the field of Computer Supported Cooperative Work.) Supporting the coordination of the work with computerbased technology is often described as the aim of the CSCW research effort.

When speaking of the people engaged in cooperative work, the term *actor* is often used. Strauss (1985, pg. 6) describes an actor in the following way. “An actor can be a unit of any size: a person, team, department, sub-division, division, organization, coalition of organizations.” An actor is a unit of analysis, a unit which can be clearly identified. The term actor can be used for units, other than people in a work setting. However, I will limit myself to speaking of actors as the people involved in a cooperative work setting.

Another important term, when speaking of cooperative work, is the *field of work*. Schmidt (1994, pg. 15) defines the field of work as the common practice of the involved actors. The field of work is the physical surroundings and tools of the work place. The field of work also include

¹People can also cooperate without necessarily having to. Such work is not covered of this definition of cooperative work used in the field of Computer Supported Cooperative Work

the shared experience and knowledge. The field of work is defined by the type of work conducted, but at the same time, the field of work also supports and restricts the practice conducted. Schmidt stresses that the field of Work “is a conceptual construct that shall help us in analyzing and conceptualizing the formation and articulation of work arrangements”. In other words, the field of work is an analytical construct which will enable us to talk about the work setting, which we are studying.

When analysing medical work, the term *trajectory* is useful. Strauss defines the trajectory in the following way:

“In contrast, *trajectory* is a term coined by the authors to refer not only to the physiological unfolding of a patient’s disease but to the total *organization of work* done over that course, plus the *impact* on those involved with that work and its organization” (Strauss et al., 1985, pg. 8)

The trajectory is the total work done over a course of treatment. Only talking about the work conducted by the clinicians, the doctors and nurses, is not sufficient to understand the course of the treatment. The reason for this is that both the work (treatment) conducted and the disease itself influence the course of the illness for a patient. They are mutually dependent so to speak. For instance, some medical intervention might better the state of a patient, but it might also have side effects, which will then have to be addressed. Unexpected changes in the state of the patient, such as an infection after an operation will create new requirements for the interventions performed by the clinicians. The concept of a trajectory enables us to differentiate between the work conducted by the staff (and the patient) and the determining factors of the course of the treatment and illness. Strauss et al. (1985, pg. 30) stresses this fact, when they argue that “...trajectories get shaped rather than simply managed”. Medical work is very complex, and there are numerous factors influencing the development of the trajectory. The physician in charge is not managing the course of the treatment, he is only one of many influences on it.

The coordination of work is done by the members of a cooperative work setting. The coordinative tasks are traditionally termed *Articulation Work*. (Strauss, 1985, 1988; Schmidt, 1994). Conducting articulation work is necessary for managing the complexities of the work conducted. In order to perform the work tasks of cooperative work, the members must coordinate, or articulate, their work. This is the case with medical work as well.

In summary, the articulation of the lines of work and their implicated tasks conceived as necessary to the management of a course of illness is immensely difficult to rationalize. Too many conditions mitigate against rationalization to permit more than proportions of component segments of the arc of work to be standardized—and then they, too, are subject to potential disruptions. Work on and with people adds a dimension of hazards to the articulation work; if to that are added those hazards that flow from organizational, technological, and illness sources, then ‘coordination of care’ for which personnel are constantly striving but know they are not often attaining, is something of a mirage except for the most standardized trajectories.” (Strauss et al., 1985, pg. 155).

But medical work does not rely solely on articulation. *Standard Operating Procedures* exist and can help the members of a work group manage their work. Standard Operating procedures are more or less ‘official’ standards on how work is conducted. Medical schools teach their students SOPs in the form of theoretical medical knowledge. Medical knowledge is necessary for treating patients. The clinical departments at SHH develop and describe standards on how treatments are performed at the hospital. On a small scale, the work groups on the wards make agreements on how they conduct their work. The organization of the wards described in the previous section also relies on SOPs. The agreements can exist both as explicit ones on papers or as tacit knowledge in the group. The role of articulation work and standard operating procedures in coordinating work evolve over time (Strauss et al., 1985, pg. 158-160). Work and the organization of it is constantly being standardized in the organization. New tasks require much articulation work. In any organization much effort is on standardizing the work. “Official” descriptions are being written. A not so explicit form of standardization is the building

of experience in organizations. Organizations and work groups rely on experiences from earlier situations, with “already-known” problems. Standard operating procedures require maintenance and adaptation performed by the actors. Organizations and the problem-space they work within evolve over time. The SOPs need to be modified to follow this development. Official SOPs might not fit the practice at a local field of work perfectly. They thus have to be fitted to the local practice by the members of that particular practice. There may also be different perceptions of problems and SOPs among the actors of a field of work.

The relationship between articulation work and standard operating procedures is the focus of the report. The following subsections will show how the treatment of the patients is coordinated and managed both through the use of standard operating procedures and through articulation work conducted by the members of practice at ward M6. The concept of Standard Operating Procedures is also important, when studying medical documentation and documentation practice. The documentation artifacts, the EPR system and all of the other papers, are all based on SOPs. SOPs define the way that the documentation practice is meant to be conducted. (eg. What is supposed to be written and how are the writings supposed to be.)

3.1 Cognitive Therapy

This is intended as a short and general introduction to the cognitive approach, which is useful for understanding the activities on M6. These descriptions reveal details, which are important to understand in order to be able to support the clinical practice on the ward. The details in this section are solely based on statements from the staff at M6 and my observations there. (My background in Psychology has probably helped my understanding of the treatment.) An extensive study into the theories of cognitive therapy has not been undertaken, thus, the details described here should not be read as a manual on how to do clinical work.

Central to the theories of cognitive therapy is the assumption that people, the patients, act according to schemes. In their upbringing and daily lives, people learn to react in certain ways in certain situations. Sometimes, and especially in the case of psychiatric patients, some of these schemes are not usable for functioning in a *normal* life. A nurse expresses the key principals of cognitive therapy in following way:

Many patients have ill patterns of thought². Their reasoning is unrealistic. The goal of cognitive therapy, is to break down these systems of unrealistic thinking³.

Cognitive therapy involves an identification of patterns of thoughts which are perceived to be inappropriate. This process has two dimensions. Firstly, it can be described as a process of refinement, A process of breaking down beliefs and opinions into small units and then testing these. For instance when people with low self esteem say, that “Nobody likes me!”, then the task of the therapist is to break it down and to test it in the *real world*. A response could therefore be: “but you have a child, who loves you, so your statement is not true.”. Secondly, a change in the patient’s own beliefs and opinions is a key to positive results from the treatment. The case of a younger male patient is illustrative of these two points:

A patient has developed fears of being in a certain room in his home outside of the hospital, and especially fears of standing in front of the window in the room. He believes, that “people are observing him from the neighboring apartments”. This has led to a situation where he avoids the room, when he is in the apartment.

In the cognitive group sessions, his fears and beliefs (that other people are continuously watching him through the window) were discussed among the other individuals talking. The patient has been asked questions like: “Explain how realistic you think your beliefs are. Do you really think, that people are watching you systematically?”.

²sammensatte tankemønstre

³forestillinger

During a weekend at home, he is instructed to regularly go to the windows, look out, and see for himself whether people in fact are watching. He explained at the following session, how he had not seen anyone watching him in the window. He was now convinced, that his fears were unjustified, and he did not feel the same amount of fears when being in the room.

This example shows how the treatment is a process of identifying what, exactly, is the cause of the problem. The example also shows how a change in the patient's beliefs is the goal of the therapy. The goal is achieved, only when the patient is convinced, that he is not being watched. Further more the case is an example of a much used approach, called *flooding* or *exposure*. The approach is based on the theory that people avoid things that they fear. By avoiding ones fears they are allowed to grow bigger; to become unrealistic and unjustified. On the other hand, by exposing oneself to the fears, it will be proven, that they were unjustified.

Another principal in cognitive theory is the dividing of activities into pleasure and duty activities. Pleasure tasks are the things we like to do, like watching movies, to eat, or to take a nap. Duty tasks are the things we have to do, like cleaning or buying groceries. The categorization of tasks into the two groups is subjective. The same task might therefore be categorized differently by different people. Cognitive Theorists suggest, that people with addictions, spend too much time performing pleasure activities, and that they have difficulties dealing with the duty tasks. (Their behavior surrounding their addiction is focused on achieving pleasure.) In Cognitive exercises patients train in registering and categorizing the tasks which they perform as part of their everyday life. By doing the exercises, they reflect on their own categories for pleasure and duty tasks. The exercises should result in a change of lifestyle, to one where the patient's daily activities consists of a balanced mix of pleasure and duty activities. The treatment of a younger female patient illustrates this:

A patient is characterized by being very impulsive. She has gone through a number of educations, without being able to finish them. During the course of the educations, something has always *come up*; like trips to foreign countries, or other more appealing projects. She describes her problems as "spending too much time on fun things"⁴. According to the therapist, she can watch five movies at the cinema, during a weekend. She spends *too* much money on clothes and other unnecessary things. She has been abusing alcohol and drugs (cocaine, methadone, and more) for a period of over ten years.

At SHH, the patient is engaged in private therapy sessions with a psychiatrist. One of the goals for the therapy is for the patient to be able to live by a *Normal* week schedule, and only spend a realistic amount of time on *fun* things (A week where she does what normal people do: Wash clothes, clean the apartment, do home work.)

To achieve the goals, the patient is instructed to make a *realistic* plan for the coming week and write it down on a piece of paper. The plan is made prior to the weekly sessions, and discussed between the psychiatrist and the patient. Throughout the week, she is to follow the plan. Whenever she feels an *impulsive urge*, she is to write down the *urge* and save it for 24 hours. She is then permitted to follow the impulse, if it still interests her the following day. The previous week and the patient's ability to live by the plan is then discussed at the upcoming session.

The cognitive approach to treating psychiatric problems requires a coordinated work effort from the staff at M6. Information about the patient and treatment is gathered through observation and in work conducted with the patient. This is a cooperative task for the staff. A coordinated effort from the staff is necessary in order to carry out the interventions. In the flooding example, for instance, all clinicians have to help (and push) the patient into situations where the reality of his fears is tested.

⁴"Hun laver for meget sjov."

3.2 Pharmaceutical therapy

Psycho-pharmacological treatment is characterized by being experimental in its nature. Different types of medicine are tried out, and usually, the right dosage has to be found before the symptoms disappear. Following observation runs over two conferences and describes a situation, where the treatment with two drugs is discontinued. The patient in the case is a woman who has been abusing alcohol her entire adult life.

The woman has reported experiencing hallucinations, these are termed as “bizarre bodily experiences” in the EPR, which have been categorized as psychotic hallucinations. The woman has therefore been prescribed anti-psychotic drugs. A brain damage, or more specific, a memory impairment has been suspected, but a neurological test has given a negative result. Finally, the hallucinations have been suspected to be caused by epilepsy, and because of this, the patient has also been prescribed “anti-epileptic” drugs.

The hallucinations were reported before the patient arrived at M6. (The patient spend the first part of her stay at M3.) The descriptions of the incidents are, accessible to the staff at M6 in the EPR system, but they have no first hand experience of the hallucinations.

The psychiatrist at M6 believes that the hallucinations are caused by the epileptic drugs, or that they are withdrawal symptoms, which appeared when the patient stopped drinking. The latter cause is supported in the fact that the hallucination only appeared on M3 and in the fact that no neurological abnormalities were found by the test.

The plan is therefore to stop the treatment with the anti-psychotic drug. (This is changed after the first conference). As part of the plan, the nursing staff are assigned to observe, whether the hallucinations reappear, as well as, other reactions that the patients might show. At the second conference the nurses report that there have been no more hallucinations. The anti-psychotic treatment is, therefore, permanently stopped.

At the second conference, it is further more agreed, that the anti-epileptic treatment is to be stopped. And as in the previous case the nurses are responsible for observing behavioral changes in the patient.

The example illustrates how the procedure is experimental in its nature. The psychiatrist makes a hypothesis of the cause to the problem. This leads to a change in the treatment, a treatment which is to be validated in the following period. This particular example describes a situation where the psychiatrist is *tidying up* the medical treatment of the patient. (She is suspending a number of unsuccessful treatments.)

The example also illustrates how the procedure relies on a cooperation between the nurses and the psychiatrist. The psychiatrist makes the changes to the patients medications. The nurses are then responsible for observing the effects of the changes.

3.3 Medical work is cooperative work

Psychiatric treatment is a very wide reaching discipline. In its wide definition, psychiatric work is aimed at helping the patient to be able to manage his or her everyday life. In psychiatric treatment staff members cooperate in order to do all of the tasks relevant to “the life of the patients.” As for the nurses these tasks have been labelled Social Psychiatric work (SPW). Most of the professionals involved in treatment are also performing SPW. The psychiatrists are performing medical and therapeutical treatments with the aim of making the patient able to “handle his or her life situation”. The social work is engaged in the treatment to secure the patients social circumstances; housing and living expenses. The social worker is responsible for offering the patient relevant social, educational, and care services provided by the community. The nurse, the

contact person, will often play a practical role in helping the patient (re)establishing a “normal” life. The nurse will often accompany the patient to meetings and she will help the patient to fill out forms and applications.

Helping the patient manage or reestablish his life is a complicated project. Many actors are involved in it, sometimes working on different tasks, or sometimes involved in the same tasks. This work has to be coordinated, so that the actors are all working effectively together. All of the tasks of managing the patients’ lives also creates a lot of “case-processing” and “office” work. Through out a shift the nurses have to answer many phone calls, setup numerous appointments, send off letters, and check up things, in order to successfully *manage the lives of the patients*.

Patients play an important role in their own treatment. This argument was put forward by Strauss et al. (1985, chapter 8: The work of patients) in their comprehensive and classical study of *social organization of medical work*. In fact, in many cases the treatment would not be successful (or even possible), if it wasn’t for the cooperation of the patient. Patients will often have to report symptoms to the physician in order to make a diagnosis of the problem. Patients are often also responsible for carrying out the treatments, such as taking their prescribed medicine or minimizing the use/stress of a strained ankle. Even the *simple* task of taking an X-ray photo requires that the patient maintains a certain body-posture.

The patients on ward M6 also play a central role in their own treatment. This should be clear from the examples given previously. As mentioned, the goal of cognitive therapy could be described as, helping the patient realise and change *inappropriate* patterns of thoughts. This is essentially a process, which the patient himself is responsible for. The staff members can influence the procedure, but the changes have to take place within the mind of the patient. The staff members can be said to have the role as a catalyst. The above descriptions of the social psychiatric work also reflect this organization between the staff and the patient. According to Strauss et al. (1985) the work of patients can be both visible and invisible to the staff members, as well as, being legitimated or illegitimated. The staff members at M6 are very aware of the role of the patients in the treatment. This is deeply rooted in the theory of their work. The issue of legitimate or illegitimate patient work is also a central aspect of the treatment at the ward. In fact, the overall goal of any treatment at M6 is that the patient will be able to lead a normal life, doing *legitimated things*.

Tasks and problems faced by the staff can both be of a clinical and managerial (control of resources) type. The problem of deciding when to close the ward down for the weekend, is a problem which has both dimensions. From time to time, most or all of the patients are leaving the ward for the weekend. The ward will therefore be closed down from Friday to Sunday. Deciding whether to close down for the weekend or not is a repeating problem. The problem has a managerial dimension, in that running the ward with only a few patients is very costly. The clinical dimension of the problem comes from the fact that the overall goal of the treatment is *training* the patients in leading normal lives. The weekend outings are important exercises, in which the patients train in leading a life at home. However, the hospital is responsible for the patient during the hospitalization, including the weekend outings⁵. A patient therefore has to be as considered *ready to leave the ward* by the staff. Two criterias are set for this: It has to be considered “safe” for the patient to leave, meaning that he or she can leave the ward without resuming the addictive behavior. Secondly, explicit purposes for the leave should be stated prior to the leave, giving the outing a therapeutical dimension.

The contact person usually descides, when a patient is to leave the ward for the weekend. This decision, however, has to be authorized by the patient’s psychiatrist (or another psychiatrist, if she is not available.) Likewise, the decision of closing the ward for the weekend is often taken during the (nursing) staff’s meetings on the same friday. But again here, the decision has to be authorized by a Psychiatrist from the managerial department. Differences in opinions regarding this issue were observed several times during my observations on the ward. The Psychiatrists were often less motivated for sending the patient home for the weekend and consequently closing

⁵If a patient were to die from an overdose of drugs during a weekend outing, the hospital would be held liable of his death.

down the ward. There are two obvious reasons for this. Firstly, the nurses are responsible for keeping the budget financially and man-hour wise.⁶ Secondly, the plan with and purpose of the weekend leave is conceived by the contact person. The psychiatrists, on the other hand, are in a position where they have to be convinced of the benefits of the weekend leaves.

Communicating their arguments to the psychiatrist is therefore important to the nurses. In order to support the communication of clinical arguments for weekend leaves, a paper form was developed by one of the nurses. (The idea of the form was conceived at a conference, where the problem was debated.) On this paper, the patient has to describe the purposes for the leave, as well as, give a detailed plan of what he has to do during the weekend. The paper, therefore, serves two purposes: To the patient, the paper functions in line with cognitive principles. When having to describe his weekend, the patient trains planning a *normal* weekend. At the same time, the paper documents the purpose of the weekend leave to the one who has to authorize it. The Weekend Leave form, as the paper is called, will be presented in section 4.2.

⁶The nurses are often called in on extra shifts on a short notice in order to fill empty spots in the work plan. Short Fridays were therefore also greatly appreciated by the staff.

Chapter 4

Documentation artifacts

This section will provide an overview of the documentation work conducted on ward M6. The different documents used by the staff and the EPR system will be presented in the following subsection. The presentation will focus on the part that could be labeled as the formal descriptions of the documentation practice. In other words, I will describe the way in which the documents and artifacts are used and the way in which they are intended to be used. (The intended use of the artifacts is articulated in manuals and in statements from staff members during my observations.) The documentation work of the staff members and the actual use of documents and artifacts will be further discussed in the following sections.

The presentation of documents and artifacts is divided into a number of subsections. In the first section, all of the *standard* documents are presented. In the second subsection, a number of paper based documents and artifacts will be presented. All of the documents discussed in the first subsection are produced with and stored in the EPR system and they are part of the *official* documents described in the clinical manuals of the hospital. The paper based documents, on the other hand, are used and maintained by the staff at M6 independently. With the exception of the patient record folder, none of the documents are part of the official documentation produced on the patients.

The documents also play a role in planning the work of the health professionals. In the third subsection, selected documents will be discussed in further details, as well as, their purpose as artifacts used for planning the treatment.

Finally the EPR system is presented in the two last subsections. This presentation focuses on document layout on the system as well as the principles for writing documents on it. The role of the system in documenting the handling of medications is also described.

The following descriptions of documents and artifacts illustrate two important aspects of the documentation work of the staff members. Firstly, documenting work seems to be a big and complex task. Many different documents, with each their separate functions within the total body of documents, are used to document the work with each patient. Secondly, the descriptions also show how the total body of documents are both electronic and paper based ones.

4.1 Overview of documents during a hospitalization

Many different documents are written about the patients during their stay at SHH. A large number of professionals contribute to the patient documentation, each writing different documents. Below is a list of most of the documents written about the patients on ward M6. It should be noted, that other forms are used by other wards, so the presentation of documents can not account for documentation work at other wards. Furthermore, the documentation practice changes over time in the wards, which will probably make this account obsolete and outdated in the near future.

The descriptions are based upon a “manual for documentation of the nurse’s work at sct. Hans hospital” (Nurses at Sct. Hans Hospital, Nursing department, 2001), along with a manual of the EPR made by the EPR control group at SHH (EPJ–control group, 2001). Information from interview and more informal talks with the staff have also helped to provide information for this section.

Some of the most frequently used document types are listed beneath:

Nursing Notes are documents used by the nursing staff to write down incidents and activities, in order to enable future recollection of the information. All notes are listed in the system according to the time of their occurrence.

Treatment Notes are written by the psychiatrist whenever she consults a patient or performs some treatment.

Therapy Notes are written by clinicians running therapeutic session, such as, the psychologists running group therapies.

Social Worker’s Notes are used by the social worker to document his work with the patient.

The Special Agreements is a section, in which the staff write down important information necessary for coordinating their work. Different groups of the staff use this section. Appointments of meetings between contact person, social worker, and other institutions are examples of entries in the special agreements section.

The plan of Treatment is the central document, in which the overall treatment(the arc of work¹) is described. The Plan of Treatment is written by the psychiatrist on the basis of the debate at the conferences.

The Nursing Plan is written by the contact person, and can be viewed as a *plan within the plan of treatment*. or a sub-plan. Two or three Nursing Plans are usually described on the same patient at a given time.

The Nursing Status is a document describing the overall state of the patient. Nursing Status documents are made prior to the conferences, and they are meant to be part of the foundation, on which the nursing plans are made.

Figure 4.1 shows the documents described above. The model also shows the different notation documents and the pharmaceutical module of the EPR system, which are used throughout the hospitalization. Besides from the documents used throughout the treatment, a number of specific documents are written in the beginning and end of the treatment:

The Visitation Note: The head nurses of all of the M wards, the Psychiatrist assigned to the patients on the wards, the clinical nurses and psychiatrists discuss the patients prior to their arrival at SHH. These discussions take place at visitation meetings held weekly. The results from the discussions are documented in the visitation note.² As noted earlier there are two main purposes of the visitation: To judge whether the patients will respond positively to the treatment and therapies offered on the M wards. And to assess which one of the M wards the patients should be placed on.

The Patient Reival Checklist: The nurses fill out a check list of the tasks which have to be done upon, and just prior to, the arrival of the patient. Examples of the tasks prior to the arrival are: Assignment of the role of contact person, preparing the patient’s room, and reading of relevant documents on the patient. At the arrival: Informing the patient of the rules and regulations of the hospital and ward, informing the patient of the treatment and therapies offered. Handing out folders on treatment, social, and legal issues relevant for psychiatric patients.

¹The arc of work is a term used to group all of the work tasks included in a particular project, such as treating a patient (Strauss, 1985)

²One note is written on each patient.

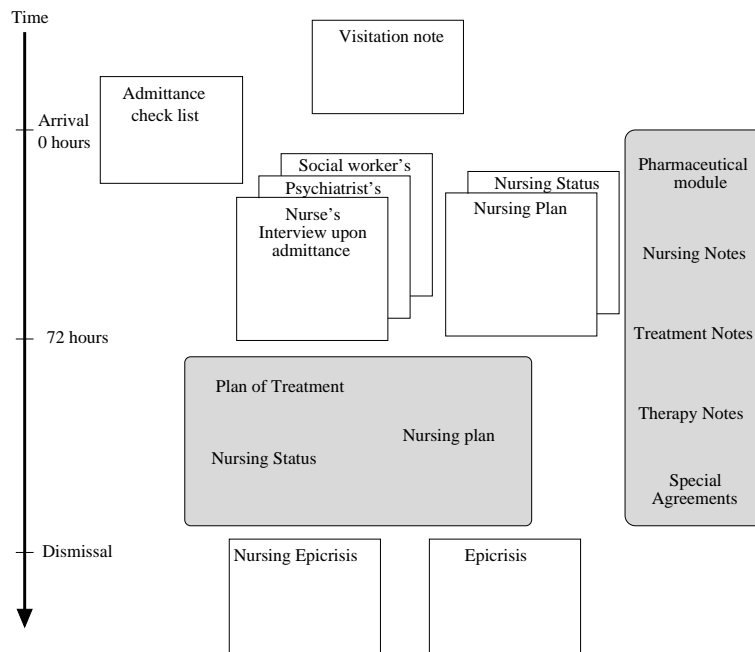


Figure 4.1: Overview of the documents written during the hospitalization of a patient.

The Nurse's Admittance Interview: This has to be conducted shortly after the arrival at the ward and results in a formal document in the EPR system. The purposes of the interview is: to establish a formalized cooperation between the patient, the nurse, and possible kins; For the nurse to collect relevant information about the patient; And to assure that urgent matters are dealt with (patient's pets or children left alone at home, etc.).

The Physician's First Examination of the Patient The physician also has to do an interview with the patient, upon his or her arrival to the ward.

The Social Worker's Admittance Interview: The social worker has to talk to the patient within the first 72 hours of the patient's stay at SHH. This is to secure the patient's social and economical state during the stay at SHH. (For instance, that patient's bills are paid during the stay, and that possible debts are dealt with.)

Epicrisis: The psychiatrist is responsible for writing an Epicrisis document. This documents sums up the patients state at arrival and departure, and in addition to this, it describes the treatments performed during the course of treatment. It is sent to the patient's private physician and other relevant parties (eg. Institutions which the patient is in contact with.). Most of the information in the Epicrisis is auto-generated from other documents in the EPR system.

Nursing Epicrisis: The contact person writes a Nursing Epicrisis document similar to the Psychiatrist's. The Nursing Epicrisis consist of the nursing status document at the time of arrival and dismissal, a long with descriptions of the treatments performed. The document is send to "care" institutions with relations to the patient.

The *arrival* documents all have to be completed within the first 72 hours after admittance. These requirements are set by the hospital management and official standards for hospital documentation, defined by "Joint Commission of International Accreditation. (Nurses at Sct. Hans Hospital, Nursing department, 2001)

An initial nursing status and nursing plan also have to be prepared in the admittance face³. These documents describe the patients' problems, as they appear upon arrival and the interventions started by the nursing staff. A typical fist nursing plan will call for a period of gathering information about the patient.

The documents written about a patient exist in different medias. The documents discussed above are all stored in the EPR system. Other documents are paper based and these will be introduced in the following section.

4.2 Papers, forms and the paper record

A great number of different forms and papers are used in the work at M6. These papers exist side by side with the electronic information in the EPR system. Some of the documents are used and owned by the staff. Other documents are owned by the patients and used as a central part of their treatment. This section will describe a selection of these documents, and discuss the relations and connections between these different documents and media (the EPR system's relation to the papers).

Paper forms used as part of the cognitive treatment:

The Patient's Binder: When arriving on M6, all patients receive a binder containing papers and forms. The papers are tools used in their cognitive therapy sessions, which the patient will attend in during their course of treatment.

The patients are often given assignments, which they have to complete for the next session. For instance, in the previously described case of the young man with fears of being watched, an example of an assignment given to him would be to let him describe his thoughts, feelings, and reactions around the situations, where he feels anxiety⁴. The descriptions are to be written on a paper scheme, which is then kept in the binder.

The Weekend Leave form is a document describing the patient's plans for an upcoming weekend, where he or she is leaving the ward. The form has to be filled out and discussed with the contact person before the patient is able to leave the ward. The fields of the form can be seen in table 4.1.

The form has three text fields. In the first field, the patient has to describe the purposes of the leave. In the two other fields, the patient has to describe the "pleasure tasks" and the "duty tasks" which he or she will engage in during the weekend. The form serves two purposes. Firstly, it documents the purpose of the leave, and secondly, it can be seen as a cognitive exercise for the patient (as described in section 3.1).

The Patient's Conference form is a document filled out by the patient prior to the conferences. The document is used to record the state of the patient at a given time. The document consists of a matrix of fields (see table 4.2), which cover different aspects of the patient's overall state.

When filling out the form, the patient has to describe his psychological, physiological and social state. The patient also has to account for his opinions about the activities at cognitive group. Covering all of these aspects, the patient has to describe both their current state and his or her future goals. As well, they are asked to reflect on the activities and development in these areas (evaluation). The staff can write comments from the debate at the conference in the Conference Conclusion field (During my observations, this field was not used by the staff).

The patients will usually fill out the *Now* row, but might skip the other sections. Many patients experience difficulties filling out the *Goals*, and in particular the *Evaluation* rows

³A plan of treatment will follow after the first conference, which will usually take place shortly after the arrival on the ward

⁴This exercise should help the patient to get a better understand of his feelings and reactions, thereby enabling him to reflect on his beliefs and ultimately to alter his behavior

Purpose for weekend	
Pleasure tasks	“Duty” tasks

Table 4.1: The weekend leave form

	Now	Goals	Evaluation
Psychologically			
Physically			
Socially			
Cognitive group			
Conference conclusions			

Table 4.2: The Patient’s Conference form

(According to a nurse at M6). Because of this, the contact person might sometimes help the patient filling out the scheme.

The scheme is read out at the conference, and thus, serves as the *patient’s voice* at the conference. According to a nurse, the document might also be used by the nurse as a reference in the process of writing the nursing status document. Finally, since the scheme will be kept in the patient’s binder after the conference, the scheme can be used by the patient to track the developments in his or her state and treatment.

Keeping the document in the binder makes the documents accessible to the patient, when he or she needs them. Keeping the document in one place makes it possible for the patient to track his development during the course of treatment. The patient can look through the papers and see improvements in his state and problems. A nurse described how this procedure is often used with depressive patients. When browsing through the binder, the patient can see for himself that he values himself higher in the later descriptions, that he has a better understanding of his problems, etc..

The information in the Weekend Leave form is typed into the Nursing Notes section of the EPR system. The information is typed in by the nurses manually. As noted earlier, the weekend leave form was created as a response to the debate at one of the conferences. A difference of opinion existed between the nurses on M6 and the clinical staff at the managerial department. The weekend leave form was created in order to document a clinical purpose of the weekend leaves. At first, the forms were kept by the patients in their folders, a procedure which did not achieve the desired result. In order to make the documentation of the weekend leaves visible to the clinical staff, it was decided that the forms were to be typed into the EPR section. To support the new procedure, a check box was added to the form so that nurses could indicate whether the form had been entered into the EPR system or not. According to a nurse, this was necessary, because forms are sometimes in the office for a few days before someone can find the time to enter them into the system.

The Patient’s Conference Status form is sometimes used by clinicians. Occasionally, the psychiatrist might want a copy of the paper. A copy will then be taken and placed in the paper based records (as working notes or as enclosed documents).

Several papers and paper-based systems are used by the staff to coordinate the work activities:

The Visitation Papers are produced at the visitation meeting. These hold a short description of the patient and the conclusions from the visitation meeting. The papers are kept in a

metal filing cabinet in the staff office on M6, and together they make up the list of patients waiting to be admitted into the ward.

The Psychiatrists' Contact Folder are used to facilitate the correspondence between the psychiatrists and other actors. The folders are organized in sections, one for each bed (patient). In these sections, the nurses can write down tasks for the psychiatrist to perform on her daily rounds (eg. to examine a patient's foot, or talk to patients on their request). The nurse will also put lab results, sent to the ward by mail, into the folders.

The Calendar: The main artifact, facilitating the coordination of both treatment related and practical activities, is a larger calendar. The calendar lies on the desk in the staff's office and is used to write down appointments and planned tasks in. The calendar is formally updated at the morning report meetings, but is frequently consulted during the shifts. The calendar is made up of printed sheets of paper. (Printed on the color printers in the office.) The calendar pages are made in a program installed on one of the computers. They have a "calendar" outline and contains a section for time-organized entries and non-time-organized tasks. Standard tasks, such as ordering sheets and linen at the laundry service or administering the medicine throughout the shift, are pre-printed on the pages.

At the morning report, tasks are assigned to the nurses and this is written into the calendar. Tasks and appointment are checked off, when completed. The calendar is often consulted at staff meetings and conferences.

A Medicine List is printed out weekly. The medicine list is used as a reference document, when handling the patient's medicine. The document is divided into sections, one for each of the different types of prescriptions: the different regular times of handing out medications (for instance, medicine given once a day); or medicine which can be given when needed. Under each section the patients and their medications are listed.

The list can be used as a script when a nurse fills up the medicine tray. She can work her way down the list when filling the patients' cups.⁵ The document can also be used as a reference when handing out medications to patients outside of the scheduled medication times. The paper is quicker to use because, there is no need to log in to the EPR system and select the patient's file. Even though, some nurses primarily use the EPR system directly to look up information about a patients medication.

The Conference Schedule is a paper used to coordinate when patients are discussed at conferences. Table 4.2 illustrates the information in the Conference Schedule. The plan shows the patients and the dates which they are discussed at the conference. The patients are listed down the left side of the paper. The associated Nurse and psychiatrist are printed beside the patient names. There are two dates on the paper; the previous conference date, and the next date. The next date is set in a different color on the paper, if the patient is scheduled to be discussed at the coming conference.

At the conference, a printout of the plan is used to schedule the coming conferences. The nurse will use the plan to check for *openings* in the future conferences, and she will write patients down on future conferences using a pen. The printouts of earlier plans are placed behind the present plan, giving the staff an possibility to look back in the history of conferences on a patient.

The plan is based on a MS Word document, which is revised by one of the nurses after each conference. Copies of the plan is send to the psychiatrists, the social worker, and the physical trainer the following Wednesday (two days ahead of a conference).

The Paper Based Records: Parallel to the Electronic patient records, a paper file is kept to store letters, lab tests and other correspondences between SHH and other actors. The file

⁵Patients receive their medicine in a little plastic cup. A cup can contain a number of pills all given to the patient at the same time. Some patients are responsible for handling their own medication. Medicine for these patients is places in containers with sections for each handout. (The container has four sections, one for each of the times where the medicine can be taken during a day.)

Date of next conference: 08-02-2002				
Patient	Nurse	Psychiatrist	Previous Conf.	Revision
Gina	Jill	Anne	07-05-2002	08-16-2002
Joanne	Rob	Thomas	07-12-2002	upon release
Kyle	Rosie	Anne	07-05-2002	08-23-2002
Michael	Stephen	Thomas		08-02-2002
...
Revised by: Nigel				

Table 4.3: The structure of the plan of conferences. (Details from the original left out)

also contains the records from previous hospitalizations at SHH (before the change to electronically based documentation).

The paper records are kept in the filing compartment in the nurses office. The records can be lent out to other clinicians, for instance, psychiatrists or psychologists. But the records belongs on the ward during the patients stay at the hospital. When new patients are admitted, at new record is made. When *old* patients are admitted the records are retrieved from the hospital library.

The paper record consists of sheets of paper, the pages collected in a plastic folder. The paper record is organized in different document sections. Physically, the organization is accomplished using a piece of paper (a divider) folded around the papers of each section. A paper record can have following content:

The Personal information (*Stamdata*) are placed in front of the folder. These are a few sheet of papers with the basic information about the patient, for example, home address, relatives and allergies (cave).

The Medical Record Notes and enclosed documents (*bilag*) are organized in a paper divider. An index that lists the different hospitalizations (at SHH) is printed on the divider. The dates of each hospitalization is hand-written on the divider.

The section contains: The old paper records (of hospitalizations prior to the existence of EPR at SHH); important documents such as correspondence between the hospital and other public offices; epicrisis documents from other hospitals; test results from the current and previous hospitalizations. The section will often also contain notes and temporary work papers. These types of papers are placed in front of the section and will be removed from the journal when they are not needed anymore.

The Nursing Notes and enclosed documents (*bilag*) The notes written by the nurses are kept in a separate section. Before implementation of EPR, nurses wrote paper based notes; the *Cardex* notes⁶. The *old* Cardex notes are kept in this section. The date of transferal from paper based to electronically based notes is marked on the outside of the section folder. After the introduction of EPR, the nursing note section mainly contains different forms and papers which cannot be filled into the electronic system. Cognitive forms are examples of documents kept in the nursing section of the paper record. The nurses refer to paper documents in their electronic notes (i.e. "see documents xx in the paper journal.").

The "old" medical journals are a long chronological line of notes and treatment plans. All entries are listed in chronological order from the patients' admittance at the hospital to their departure. The only index is a page number written on each paper. The journals contain both the psychiatrist's notes and the treatment plans mixed according to the time they where written.

The social worker still keeps his own file on the patient along with notes in EPR. These documents have not been investigated in the process of making this report.

⁶ The Cardex notes are *ad hoc* notes written by the nurses. The entries are listed chronologically, each containing a short description of the problem, the proposed intervention, and a short evaluation of the performed intervention.

4.3 The structure of three key documents

All electronic documents in the EPR system are made up with a number of predefined sections. When staff members write documentation, they fit their argumentation into these categories. The Note documents are very simple in their structure. Plans and Status documents, on the other hand, are very complex in their structure, having several sections and subsections.

The documents are structured in order to achieve the purposes defined for them. In section 5, it is argued that medical informations need to be standardized and structured in order to enable, for instance, statistical operations and comparing. The documents are structured according to a standardized format for these reasons too. Another important purpose of the documents are that they have to support the staff in the planning of their work. The structure of the Plan of Treatment and the Nursing plans are designed to achieve this.

This section will describe the functions of the key documents used to document the treatment of a patient.

Table 4.4 shows the structure of the three main documents; the Plan of Treatment, the Nursing Plan, and the Nursing status document.

The Note documents contain only a single or a few sections. The Nursing Note document contains only two sections. A note, called The Nurse's note of the day and an auto-generated PN medicine note.⁷ The auto-generated notes are produced when a nurse hands out a PN medication to a patient. A message is automatically generated in the Nursing Note document. (The medicine module will be discussed in section 4.5) The notes are organized in the document, automatically, by the time of their occurrence (ie.the time they where authored).

The Receival Check List is a relatively large structured document. The purpose of the document is to ensure that when a new patient is admitted to the ward, all important tasks are undertaken. As the name of the document insinuates, the structure of the document is utilized to lead the nurse through a series of important tasks ensuring that none are overlooked.

The Plan of Treatment document (see table 4.4) is written by the psychiatrist following a conference. A Plan of Treatment is required by law to be written on every patient (According to a EPR coordinator). The other documents in the EPR system are required by documentation standards set by the hospital itself.

The different revisions of the Plans of Treatment are listed chronologically in the document. Because of this, each plan in the document is numbered. The number enables the reader to orient themselves, when browsing through the document. Secondly, all plans have a diagnose field with one or more diagnosis given to the patient.⁸ Thirdly, the plan contains a short description of the *patient's history of illness* and other relevant information.

The following sections of the plan describe the *actual* plan. Planned tests are listed in the planned tests section. Goals for the hospitalization are also described in the plan. Following the goals, the interventions necessary for accomplishing the goals are described. The treatment is divided into different categories. Psychotherapeutic treatment is often performed by a psychologist. The nursing staff is responsible for the social psychiatric treatment (*Miljø terapi*). The social worker is responsible for the tasks described in the Social section. (the contact person is often involved practically in the social initiative as well).

The Psychiatrist is formally responsible for the planned medical interventions but assisted by the nursing staff in carrying out the plans. Thus, the Plan of treatment serves an important coordinative function. The many different interventions carried out by different actors, which have been coordinated at the conferences, are described in the Plan of Treatment. The plan can

⁷PN medications are drugs prescribed to the patient by the psychiatrist, drugs that can be used when necessary. Typical PN drugs are pain killers, used when the patient is in pain. Anti-anxiety drugs are often also prescribed as PN medicine and given when anxiety attacks occur.

⁸The diagnose given on the patients, follows the ICD10 system (International Classification of Diseases (Duisterhout et al., 1997)). The diagnosis are implemented in the system and assigning a diagnose to a patient is physically done by selecting the appropriate diagnose from a list in the EPR system.

Plan of Treatment	Nursing Plan	Nursing Status
<ul style="list-style-type: none"> • Number • Acceptance of treatment • Diagnosis • Short resume of patient (story of illness) • Planned tests • Goals for hospitalization • Treatment <ul style="list-style-type: none"> – Psycho therapeutic – “miljø terapeutisk”^a – Social – Psycho pharmaceutical • Patient’s opinion of the plan • Expected duration of hospitalization • Next revision of plan 	<ul style="list-style-type: none"> • Title • Data collection • Nursing Diagnosis (Problem, etiology, Symptoms) • Goals (short and long term goals) • Nursing interventions <ul style="list-style-type: none"> – Patient involvement – Information and teaching – Patient Support – Environmental adaptation – Observation and Surveillance – Specialized nursing – Pharmaceutical administration • Evaluation <ul style="list-style-type: none"> – Staff’s judgment – Patients conception 	<ul style="list-style-type: none"> • Communication • Knowledge / Mental state • Respiration / Circulation • Nutrition • Secretion • Skin / Tissue • Activity • Sleeping patterns • Pains and aches • Sexuality / Reproduction • Psychosocially <ul style="list-style-type: none"> – Emotionally – Relations – Socially / Economically – Addiction – Legal aspects – Spiritual / Cultural – Well being / overall impression – Test scores

^aTranslates into Social Psychiatric work. This is the term, which describes the sort of treatment mainly performed by the nursing staff.

Table 4.4: The structure of three “big” patient documents: the Plan of Treatment, the Nursing Plan, and the Nursing Status.

serve as a reference for all of the involved actors.

Finally an expected time frame for the treatment is set. This time-frame also constitutes the date of the next revision of the plan. The date is noted on the plan.

The Nursing Plan (see table 4.4) is a document describing a problem, a number of interventions aimed at solving the problem, along with an evaluation of the interventions and actions.

The document has a title, which refers to the central problem of the plan. The title also distinguishes the plan document from the other documents in the EPR system (see section 4.4). The plan consists of a short description of observed problems and incidents, which are characterized as *particularly impairing* for the patient. On the basis of the description, a nursing diagnosis is defined. A nursing diagnosis consists of three parts; a well defined (afgrænset) problem, a presumed explanation of the problem, and a description of the symptoms caused by the problem. Then goals are set for the interventions. Goals can in short be described as an estimation of what can be done to the problem within a certain time frame. The nurse's manual of documentation stresses that goals should be described in *measurable terms*, so that they can be evaluated later on. Time frames have to be set for the goals described in a plan. When a goal has to be met should explicitly stated, thereby setting a date where the plan is to be evaluated. Finally, different interventions aimed at achieving the goal are described. These interventions are divided into different types of work. Typically several interventions are planned at the same time to solve a problem.

The Nursing Plan has to be evaluated at the date defined in the goals section. An evaluation is a procedure divided into two stages. Firstly, the diagnosis, goals, and planned interventions are compared to the actual work done in the period from when the plan was written to the evaluation. Have the goals been achieved? Which interventions were successful? And is the problem of the plan still relevant? These questions are answered in the evaluation section. Note that the evaluation also consists of the patients conception and expressed opinions about the treatment and results.

The evaluation can then result in one of three further actions. If the goals are met, the plan will be terminated. If the evaluation shows that the goals have not been achieved, it will result in a modification of the revised plan (lowered goals, different interventions, etc.). The evaluation might also reveal problems that are different from the one described in the plan. This might result in termination of the plan and description of new plans.

When Nursing plans are being revised, alterations are written under each section. The Nursing plan differs from the other documents, in that the plan is only listed once in the system. The different revisions of the sections will then be listed chronologically after each other in the sections of the plan.

Nursing status documents (see table 4.4) are meant to be written regularly, or when changes in the state of the patient demands it. Status documents provide an overall view of the patient. As a structured document, the Nursing Status serves a purpose similar to the Receiving Check List. It makes sure that the author covers all aspects of the problem in his or her descriptions.

The state of the patient, for example, the patients ability to communicate or a description of the sleeping patterns of the patient, is described in a number of sections. The last section, named *Psychosocially* and the subsections of this sections are specifically relevant in the psychiatric field of work. These sections focus on the behavioral and psychological aspects of the state of the patient. The *Well being / Overall impression* section is different from the other sections. In this section, the nurse have to describe the patients impression of his state. It is emphasized in the manual of patient care, that the patients *words* should be used to describe this.

4.4 Handling the electronic documents

The electronic patient record system consist of three modules: the lab test module, the medicine module, and the note section. The results of blood analysis produced in the in-house laboratory

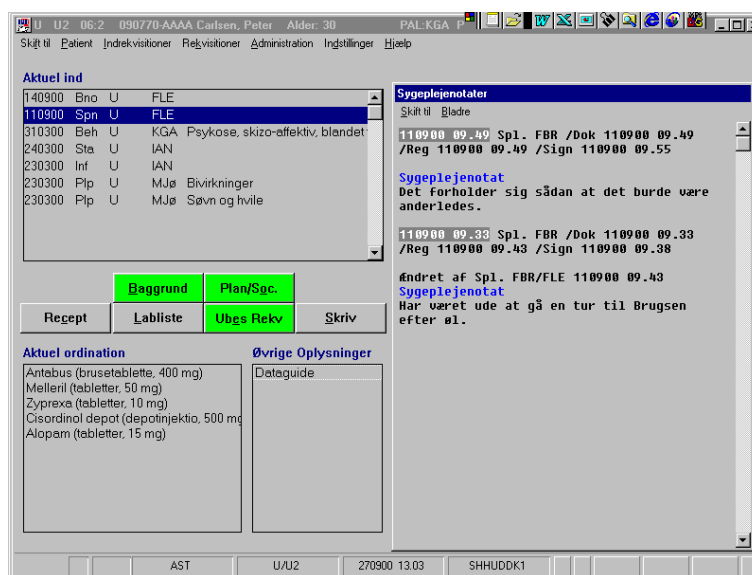


Figure 4.2: Screen shot: the main view over a patient's documents.

⁹ are stored in the lab test module directly, when produced. The lab test module will not be discussed further in this report. The medicine module is used in the work of administering the medicine given to the patients. The medicine module will be discussed in the following subsection. The note module contains all of the textual documents written during the treatment of the patient. These documents have been described in the two previous sections. In this section, the process of handling the electronic documents will be described. Firstly, the presentation of the documents in the system will be discussed. And secondly, the process of writing and revising documents will be dealt with.

All of the electronic documents written are available to the clinician in one place; the EPR client programs running on the computers in SHH. Figure 4.2, shows the *main document view* listing the documents written on a (fictitious) patient.¹⁰

The documents are foremost listed according to their type. The documents are listed in the upper left corner. Five different pieces of information about the documents are available to the user in this list: the first row lists the date of the last entry into the document; the type of the document is printed in the second row; third row lists the hospital section or ward, where the document was written at; Fourth section lists the initials of the last editor of the document; The fifth row displays the title of the document. Titles are only used in some of the documents. In figure 4.2, The plan of treatment (*Beh*) and the nursing plans (*Plp*) all have titles.

Most documents types are only represented in the list once. This is the case with the Plan of Treatment, the Nursing Status and all of the Note documents. The different revisions of the document are listed within the same document. This is the case with the Plan Of Treatment document. Same principal applies to the note documents, where the different entries are listed historically within the same document. The Nursing Plans are handled differently. As noted earlier, and illustrated in figure 4.2, several Nursing Plans are usually active on a patient at the same time. The user can then distinguish between them on the basis of their title. The

⁹The laboratory at SHH.

¹⁰All Screen shots in this report are taken from the locally produced manual of the EPR system (EPJ-control group, 2001)

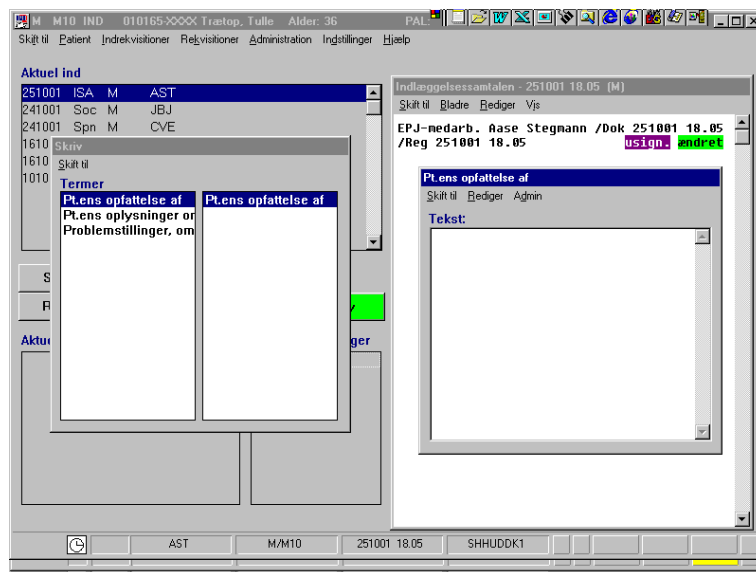


Figure 4.3: Screen shot: writing a note on a patient.

Nursing Plans also distinguish themselves by the fact, that they are revised on a section level, as noted earlier.

As noted, the date noted on a document is the date of the last written entry or revision. Furthermore, the list of documents in the Main View is sorted so that the newest documents are placed in the front of the list. This makes it possible for the staff members to get an quick overview of the activities going on at a given moment. When having to *read up on a patient* the staff member can start with the first document, and then make her way down the list, until the relevance of the information becomes too low. This also means that Treatment and Nursing Plans, placed in the back of the list will be perceived as less important topics and possibly outdated by the user of the system. The organization of the documents enables the staff members to easily form an understanding of the current topics focused on by the staff.

The limited amount of information on the main document list has some implication for the staff member reading the documentation on a patient. It is not possible to see older entries or revisions hiding within the documents, just as the time of their entry is not visible either. This also goes for the authors listed on the documents. The initials on the list only refers to the authors of the last entry. In short, the user can not get historical information about the documents in the main window. It is not possible to get an overview over the development of the document. In order to get this, the reader will have to read though each of the documents. (A document can be opened by selecting it in the file list. Figure 4.2 shows an *open* document.)

Finally, the file list does not permit the users to mark, when a documents is terminated. This functionality is useful when writing Nursing Plans. These are terminated, when the goals are met or replaced by other goals. In order to mark a Nursing plan as terminated, the nurse have to manually write it in the plan. This procedure has the disadvantage, that a reader will have to open each plan in order to check if they are in use or not.

As noted earlier, the documents in the EPR system are all structured in a number of predefined sections. When writing a document, these all have to be filled out. In cases where certain sections are not relevant for the clinician to fill out, the sections are selected but left blank. The same procedure is used when revising documents. (Sections where a revision is not needed, are selected but not altered). Figure 4.3 illustrates the procedure of writing a document. The file list in the main frame shows, that we are writing an admittance interview; the psychiatrist's first

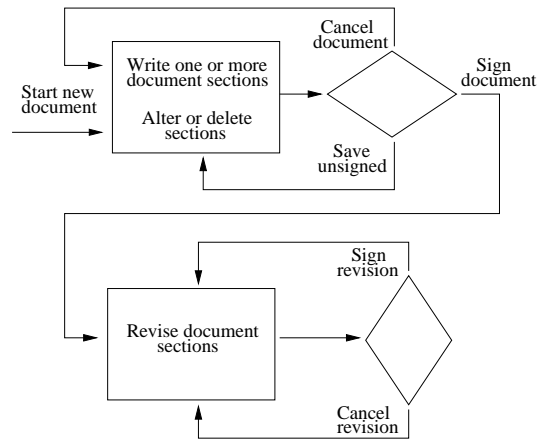


Figure 4.4: The process of writing documents in the EPR system.

examination of the patient (*Isa*). The dialog on the left has two boxes, one showing the sections of the document, and the other one showing the subsections within the section. By clicking the subsection (the right box), a text field opens, in which, the text can be written.

When revising plans, the text under each section from the previous version of the document is offered. Hence, when the content of the sections is unchanged, all the user have to do is accept the provided text as it is. When corrections have to be made to text in a section, the user only has to make the actual corrections to the text. This design of the system reduces the amount of typing that the clinicians have to do in order to perform their documentation tasks. This feature is particularly valued by the nurses on M6.

Documents can exist in the EPR system as both signed and unsigned documents. When documents are first written, they can be stored as either signed or unsigned. When documents are unsigned they can be altered or deleted freely by the author. When signed, all alterations and modification will be visible in the system. Figure 4.4 illustrates the procedure for writing and signing of documents in the EPR system.

As shown in the figure, once a document is written, the user can choose to save or sign the document. Saved documents can be both altered and deleted. When deleted the document will cease to exist in the system. Once a document is signed all alterations to a document are documented in the system. The history of revisions can be viewed, by selecting a *historic view* of the document in the menu bar on any signed document. This window will list all sections added to a document after it has been signed, as well as, the different revisions of corrected sections in a signed document.

Thus, a user can use an unsigned document as a draft document. The user can alter and delete the information in the document and she is able to put it away for a while when more urgent tasks arise. A nurse describes, how he uses the unsigned Nursing Note document as a draft. “You can write down information on the note throughout the day. Then at the end of the day, you correct and shape the notes into *the notes of the day*, as you want them to appear.”

Once a document is signed it is no longer possible to sign section-text as a draft. For instance, when a nurse revises the Nursing Status document, she will have to complete each section of the document without leaving the computer. She can leave *between* section, but each revised section will either have to be signed or discarded.

	0210	0310	0410	0510	0610	0710	0810
Terærfrihed							
Diæt		FK		vegetar			
Puls							
BT							
Tø							
EKG				051000		071000	
Skål til lab				051011			
Vægt		85.5		86.0			

Drug	0210	0310	0410	0510	0610	0710	0810
Rivotril tabletter, 0.5 mg	1910	-->	-->	-->	-->		
Anlabus brusetablette, 400 mg	0408						
Zyprexa tabletter, 10 mg	2209	-->	-->	-->	-->		
Clonidine depot depotinjektio, 500 mg/li	2209				125 mg		
Rivotril tabletter, 0.5 mg	1910	-->	-->	-->	-->		
Oxazepam Tablet, 15 mg	2209	-->	-->	-->	-->		

Figure 4.5: Screen shot: the patient status view.

4.5 The medicine module

The medicine module serves two main purposes: Firstly, the prescriptions are typed into the system by the psychiatrist, making the system the main source of information for the nurses when they administer the drugs. It displays which drugs are to be given to the patients.¹¹ Secondly, the module documents the medication actually given to the patients.

Figure 4.5 shows the medication of the patient along with other relevant physical data, such as the patients weight (Vægt) and body mass index (BMI)¹². Lab results can also be seen in this windows, when they are typed into the module. The status view window is meant to provide all of the *important* information about a patient in the same place.

The different drugs prescribed to the patient are listed along the left side of the status view, and the present dosage is written on the right side of the window. The actual drug prescriptions are listed in the matrix made out by the list of drugs and the dates listed along the top of the window. The arrows indicate that the prescription is unchanged. (A change in dosage will be marked in the field.) When a nurse wants to give out a drug, she will select a date and then press the Med.uddel.(Give medicine) button.This will present her with a dialog, where she can type in the medicine given. By clicking first on a drug (the left row) and then a date (the top), the user will be presented with a dialog, showing the drugs that are to be given to the patient on that particular day.

The system allows for the psychiatrist to write a note on each of the drugs prescribed to the patient. The note appears as a dialog on the screen, when the *i* button, placed in the right row, is pressed (see figure 4.5. In this note, the psychiatrist will usually write notes on increases and decreases in the dosage on the drug given to the patient. The notes serve as little reminders, useful in future situations, where further adjustments have to be made.

According to the EPR coordinator, the design of the medicine module have some weaknesses. The graphical representation of the drugs (given to patients) is not very detailed. In order

¹¹The medicine module is only designed to document the medication of the patients. The stocks of pharmaceutical products, kept in the medicine board on M6, are managed manually by the nurses. When new products are ordered at the hospital pharmacy, the administrative system (GS) is used to facilitate the orders

¹²The BMI value is calculated automatically by the system. The patient's weight and hight are variables in the formula used calculate the value.

to check that a patient has in fact received his or her medications, the nurse have to open the dialog window as mentioned above. This is an cumbersome procedure, when having to check all of the patients on the ward. Another shortcoming of the system reveals it self, when drug dosages have to be increased or decreased over a period of time.¹³ In these situations, the nurses have to manually calculate the dosages at the different stages and enter them into the system.

When handing out medicine, the nurses will occasionally use the Medicine List. The process of handing out medicine consists of two stages: the filling of the cups and giving the patient the cups. The medicine list will sometimes be used during the first step of the procedure. In either case, the registration of the handout will take place after the cups have been given to the patients. Some times, the nurses are prevented from registering the handout immediately after it has occurred and in some case patients might even be *forgotten*. Because of this procedure, inconsistencies between the data in the medicine module and the actual handouts occasionally occur. Handing out PN medicine to patients will usually take place in the staff's office. The handouts of PN medicine will therefore usually be registered immediately.

¹³This is often the procedure, when the dosage on psycho-pharmacological products is adjusted. For instance, when the administering of a drug is terminated, then the dosages will usually be set down gradually over a period of time in order to prevent withdrawal symptoms.

Chapter 5

Medical documentation

The EPR control group states in their status report (Bernstein et al., 2001, pg. 11), that an implementation of EPR systems in the danish health sector is hoped to result in three improvements:

- Create unity and continuity in the course of treatment, as a consequence of, among other things, better coordination of health activities.
- Create a better documentation of the *prevalence, composition and quality*¹ of the health services.
- Improve information to patients and improved dialog between patients and their kins and the professionals of the health sector.

These statements argue that the electronic media provides functionalities, which can improve the support of the work. That EPR technology can improve the coordination of the work and treatments conducted. It can help to improve the quality of the documentation of the work conducted. Finally, it is hoped that the technology can help to improve the communication between the users and the providers of health care. (This, the last statement, lies out of the scope of this report.) These goals are quite bold, thus, raising the question of whether they are in fact realistic. Secondly, they are very abstract, therefore, they require to be further exemplified. This section and the following subsections will attempt this.

To begin with, the relationship between the two terms Medical documentation and Electronic Patient Records has to be defined. Medical documentation is used to label all information used in medical work. Electronic Patient Records only refers to a specific part of the documentation, namely the patient record. Many different types of documents are used in the medical practice, but only some of the information is included in the record (The EPR system or the paper based record folder). The types of information, which can be included in the medical record is not a fixed one. Different patient records standards defined at different hospitals can include more or less of the entire medical documentation. Secondly, the two terms differ in that Medical documentation is an abstract one, where Patient records and therefore also electronic ones are concrete artifacts that contain Medical documentation.

Basically, Electronic and paper based medical documentation serves the same purposes, purposes that all have to do with supporting the work of the clinicians. As such, they can be treated as the same. But a key difference between the two is that the Electronic media is argued to provide some advantages over the paper media. It enables an integration of information from several sources into the same system in a seamless way (For instance, images, text, and medical information). Further more, it allows the information to be accessed by more than one user at the same time. The importance of this benefit by electronic systems is stressed in an evaluation report of the EPR system at SHH (Fischer & Lorenz, 1999) as well as in (Sellen and Harper,

¹forekomst, sammensætning og kvalitet

2001). Thirdly, the use of electronic systems allows for an automated processing of the data in them.

This section will briefly describe the historical development of medical documentation and electronic systems for handling medical documentation. In the following subsection, the purpose of medical information and consequently EPR system will be reflected on. Finally, a reference model, designed by the Danish Ministry of Health to meet these requirements for medical documentation, will be presented.

Medical documentation dates back to the fifth century B.C.. van Ginneken and Moorman (1997, pg. 100) refer to medical description written by Hippocrates in ancient Greece. In these descriptions Hippocrates writes down information on the development of his patient's disease. Hippocrates's notes are in chronological order. His notes are examples of *time-oriented* medical notes (records). The time-oriented medical records were accompanied by *Problem-oriented* medical records in the 1960. The first formal descriptions of a concept for a problem-oriented medical record, was proposed by Weed (van Ginneken and Moorman, 1997, pg. 101)

“[Lawrence Weed] suggested that the primary organization of the medical record should be by the medical problem; all diagnostic and therapeutic plans should be linked to a specific problem.” (Tang and McDonald, 2000, pg. 331)

In the note structure proposed by Weed, each section (each stated problem) was laid out in a so called SOAP structure. The SOAP organization of a medical problem description was: “Subjective, the complaint as phrased by the patient; Objective, the findings of physicians and nurses; Assessment, the test result and conclusions, such as a diagnosis; and Plan the medical plan, e.g., treatment or policy.”(van Ginneken and Moorman, 1997, pg. 102)

Modern medical records are organized according to a mix of three different principles. At the base level, most contemporary patient records are source oriented, which means that the information in the record is organized according to type and originator. The reason for this is that much more data is produced on patients, than where in earlier days. According to van Ginneken and Moorman (1997, pg. 104): “The enormous growth of medical knowledge has led to an increasing number of clinical specialties. Specialization leads to multidisciplinary care, so that more than one care provider is involved in a patient's treatment. In such a setting, one physical record per patient causes too many logistical problems. Therefore, there are often as many records for a patient as there are specialties involved in his or her treatment. Patient data then becomes scattered among a variety of sources.” The different records are gathered in the modern EPR system and the informations in them are organized according to the source.

The documentation in the EPR system at SHH is organized according to a mix of the different principles. Firstly, the documentation is source-oriented. Notes from the different groups of professionals are kept in separate documents. (eg. Nursing notes and the psychiatrist's Treatment Notes.) The different documents in the EPR can then be organized according to a time-oriented or a problem-oriented principle. The SHH Nursing Plan is an example of a problem-oriented document. The plan of Treatment, on the other hand, does not clearly belong to either of the two types. The structure of the plan does resemble that of the SOAP model. But at the same time, the Plan of Treatment is also time oriented, in that the different plans are listed chronologically within the plan document. (This was also the case with the old paper based descriptions.)

Nursing documentation does not have the same long and prominent history. According to the EPR coordinator, the tradition of documenting one's work is a relatively new one in the nursing profession. Nurses working in a Danish hospital setting did not start on formally documenting their work until at some point in the 1970s. Nursing documentation is not required by Danish law, as it is the case with the psychiatrist's Plan of Treatment. Instead, standards for nursing documentation are described in the clinical guideline developed at the hospital. (According to my knowledge, all Danish hospitals have described norms for the documentation of nursing work.) Despite its young history nursing documentation have undergone a large development. As mentioned earlier, the *old* nursing documents consisted only of simple time-oriented Cardex notes.

With the emergence of the Electronic Patient Record and the VIPS model of documentation, the nurses have developed into the most productive *authors* at the hospital. Where the Psychiatrists write two official documents (the Plan of Treatment and the Treatment notes), the nurses write three different official documents (the Nursing Plan, the Nursing Notes and the Nursing statuses). In addition to this, several Nursing Plans are usually maintained at the same time.

According to the nurses on M6, the reason for this is that the nurses' contact to the patient is more extensive and complex than, for instance, the psychiatrist's. Thus, they have a "greater need for operational planning" This statement seems to be supported by my observation of the work on the ward (the examples in section 3) However, it is also important to stress that the more extensive documentation standards are developed in conjunction with the change from a paper based documentation system to an electronic one.

The historical development of hospital computer systems is characterized by a shift in focus. The early systems were primarily aimed at dealing with the administrative tasks at the hospitals. In newer systems, the support of the clinical work plays an increasingly important role.

The first Hospital Information Systems (HIS)² were developed in the 1960s. The focus was on administrative issues, such as, patient admittance, discharge, and transfer. A change in focus came around in the mid-1980s, when the U.S. Federal government changed its principals on billing of medical services. Growing medical cost had led to a wish for a more *procedure-based* billing system. Earlier, hospitals paid a fixed price per treated patient. With the new system, the price was calculated on the basis of the diagnose of the patient along with the actual procedures, tests and therapies performed on the patient. This led to a growing need for including clinical information directly into the Hospital information system, in order to facilitate the hospital management (Clayton and van Mulligen, 1997; Tang and McDonald, 2000).

In most Danish hospitals the patient management tasks are handled in the Green System and the patient record is separated from this system. The discussion of the historic development of HIS is, therefore, not directly related to a discussion of the development of the patient record and electronic systems for handling it. However it does point to a general trend in the health field. Clinical information plays an increasingly important role in ensuring the best possible management of resources. The focus on digitalization of the patient records must, therefore, also be seen as an effort to improve the use of resources.

In summary, the 1990s have seen major shifts from administrative hospital information systems to systems that are used by physicians, nurses, and other health care providers as part of the process of delivering health care (i.e., *clinical information systems*). The motivation for investing in these systems is now economic. Physicians, nurses, and other health care providers must be encouraged at the point of service to help the hospital manage the allocation of resources. The group at Regenstrief Institute showed a reduction of 12.6% in hospital charges by use of such a system. (Clayton and van Mulligen, 1997, pg. 336)

A different type of medical systems, which also deserve to be mentioned here, are the so called *Expert systems*. Much attention and resources were invested in the development of expert systems during the 1970s and 1980s. (See Berg, 1997 for a thorough review of the attempts on building expert systems. For a representable example of expert systems theory, see Blois, 1984.) The aim was to build systems, which could advise the physician on the treatment of the patient or in some cases, even make the choices for the physician. Needless to say, the project has failed. Doctors are still in charge of the treatment at today's hospitals.

The rationale behind the expert systems was founded on classical Cognitive Theories on human thinking³. According to these theories, the human mind was an information processing

²Hospital information systems are defined as: "an information system used to collect, store, process, retrieve, and communicate patient care and administrative information for all hospital-affiliated activities and to satisfy the functional requirements of all authorized users." (Clayton and van Mulligen, 1997, pg. 576)

³I choose to use the term *classical Cognitive Theories* to distinguish the theories from the cognitive theories that influence the work at M6. The two theories are obviously related, but an analysis of similarities

machine. The process of managing the treatment of a patient is seen as an information processing process, which takes place in the mind of the physician. The theories argued that in a concrete situation, faced with certain symptoms and possible interventions, the physician will weigh the different arguments against each other and subsequently choose the best approach. The mind is understood as a rule based machine operating on logical principles.⁴

The task of building the expert systems was a task of modeling the information processing of the brain in the systems. The information available to the physician, in the form of observed symptoms, medical knowledge of symptoms, diagnosis, and treatments should be made accessible to the system. With these informations, the processes that stipulates the actions of the physician could be simulated in the expert system.

Much research has subsequently rejected this understanding of human thinking and the attempts of building expert systems (Suchman, 1987; Strauss et al., 1985; Berg, 1997). Berg (1997) has argued that the nature of medical problems and the criteria from which treatments are chosen cannot be solved with rule based rationalization. He argues that a given set of symptoms often suggests more than one diagnosis. Likewise, the criteria for choosing one treatment as opposed to another are usually not clear-cut, but require an *educated guess* from the physician. For instance, the best approach to treating a tumor in a patient (with surgery, chemo- or radiation therapy) is never clearly distinguishable, but has to be decided in each separate case. Berg (1997) further argues that the traditional cognitive theories do not account for the distributed nature of medical work. Medical work is distributed among different actors, each responsible for carrying out parts of the treatment and making decisions that shape the total course of treatment. The expert systems do not reflect this view of the medical practice.

Expert systems have a function similar to the one of EPR systems. EPR systems also stipulate the work conducted, although, not in the same deterministic way, as the expert systems were designed to. Berg (1997, 1999) argues that EPR systems are *accumulative and coordinative tools*. EPR systems accumulate medical data and this data then influences the coordination of work. The coordinative function of EPR systems will be discussed further under section 7.

5.1 Purposes of medical documentation

Stanley Reiser describes the purpose of the medical documentation as a tool which enables the following tasks: “to recall observations, to inform others, to instruct students, to gain knowledge, to monitor performance, and to justify interventions.” (quoted in Tang and McDonald, 2000, pg. 327.) In other words, medical documentation plays a role in all aspects of the treatment; as a tool for sharing of information about the patient, as a tool for facilitating of learning in the organization, as a tool enabling the management of resources in the organization, and finally, as a tool for documenting the treatments performed. The legal function of medical documentation is particularly important. It helps to secure the legal rights of both the patient and the clinician. On one hand, the records ensure the legal rights of the patient, in that the treatments performed, including the *faulty* ones, are documented. On the other hand, they also protect the rights of the clinician. Tang and McDonald (2000) argue that a general principle of medical treatment is that the physician should be held accountable for his knowledge at a given point in time, not for knowledge discovered later on in the course of treatment.⁵ Medical documentation should, therefore, help to clarify what was known at a given point in time.

and difference between the two has not been conducted.

⁴Other approaches also used statistical methods. These systems operated on statistical data collected on previous treatments. By using these informations on symptoms, diagnosis, treatments, and outcomes of treatments, the system would be able to advise the physician on expected results of different interventions.

⁵Advancements in treatments are made continuously within the field of medicine. However, practitioners can not be held accountable for performing treatments that are abandoned later on because of new findings. Likewise, a practitioner performing treatments on the basis of a sound diagnosis, which is abandoned later on, cannot be blamed for his work. (This situation was illustrated in the example of medical treatment in section 3.2.)

A more concrete description of the requirements for medical documentation can be found in Tang and McDonald (2000, pg. 333-345). The description consists of five important features of modern EPR systems. (These requirements also illustrate the main differences between paper based and electronic documentation systems: The ability of the electronic system to process the data in it.):

Integrated view of patient data The system should provide the user with many different informations, for example, records, notes, tests, and medical information. The informations from different sources should be integrated into the same system.

Clinical decision support An EPR system can also provide recommendations of possible treatments and drug treatments, as well as, alerting staff when certain changes in the patient's state occurs.

Clinician order entry The system may provide the clinician with relevant information when he or she is working on a patient. Examples of such are systems which provide the physician with lists of *standard* tasks to perform on the basis of the patient's diagnosis.

Access to knowledge resources EPR systems should give the clinician information about other actor's ongoing work on the patient.

Integrated communication support EPR systems should provide means for the user to communicate and coordinate their activities. Messages and alerts are tools that can help to achieve this.

At SHH, the EPR system presents the clinician with *an integrated view of patient data*. The user of the system has access to the documents of all the professionals involved in the treatment of the patient. The system contains information about the medications taken by the patient, the documents written, and results from laboratory analysis. The clinician also has access to other *Knowledge resources* on heir terminal. This is, however, provided by the hospital information network. The EPR system's ability to support the three other features, the *Clinical decision support*, the *clinical order entry* and the *integrated communication support* is debatable. The system primarily functions as a tool that stores the entries of the user. Except from a primitive messaging system, which enables staff members to send messages to each other, no automated functions are included. (This messaging function alerts the psychiatrist, when a lab result is entered into the system by the lab technician.) One function of the EPR system, however, deserves mentioning here. The presentation of the documents in the EPR system can be said to assist the clinician in his or her work. The documents are sorted after a *last in first out* principle. The newest entries in the system are assumed to be the most valuable to the reader and they are, therefore, placed first in the list. Thus, the system helps to structure the information for the user, enabling an easier *read up* on the patient.

As noted in section 4.3, all of the documents in the EPR system are structured documents. The term *structured* refers to the fact, that the documents all consist of a predefined number of sections. The structuring of the data is an important aspect of the design of contemporary documentation approaches. A structuring of the data is necessary in order to be able to integrate the data at a national level. The danish Ministry of Health have invested notable resources into this task. Two initiatives are important to mention here. These are the development of a common data standard for medical information in the Danish health section, the so called *Basic EPR data structure* (Ministry of health, 2001), and the funding of an independent *EPR Observatory*; an observation and control task force. (Bernstein et al., 2001).

The importance of structuring medical information is stressed in the report, which describes the basic EPR data structure:

“The purpose of [the Basis structure] is primarily to create a common and structured basis for communication between EPR systems, and between EPR system and other information systems in the health sector. Secondly, the purpose is to further structuring of information in the design of 2nd. generation EPR systems,

which means, that most of the information is stored in a structured (machine readable) format, not in free text. (Ministry of health, 2001, pg. 6) (Translated from Danish)

Thus, the structure is necessary in order to enable an integration of data from the different actors in the health sector. And secondly, by structuring the data, it is hoped that the data can be used produce statistical conclusions. Duisterhout et al. (1997, pg. 82) argue, that by structuring the information in EPR systems, statistical processing of the data will be enabled. Statistical data is an important tool for the hospital management, when they plan and manage the work and resources at the hospital. Statistical data is also an important source of information in medical research.

As noted earlier, the structuring of the documents are also said to improve the quality of medical descriptions. The Nursing Status document, for instance, is said to improve the descriptions of the state of the patient. The structuring of the data, however, is not exclusively enabled by the electronic media. Structured descriptions could also be achieved with the aid of paper based forms. This would in the same way improve the descriptions of the patients

According to the EPR coordinator, one of the stated goals for the EPR system is to be able to use it to produce statistical information. So far this goal has not been accomplished. At the moment only three simple sets of information can be produced with the EPR system. The administrator can see if a first nursing and psychiatrist interview is documented within the first 24 hours after arrival, and that a first plan of treatment has been made within the first 72 hours of hospitalization. A *Report Generation tool* has recently been acquired by the EPR management department, but is not yet fully operative. There are hopes that this tool can enable the technical staff to producing statistical data from the stored records.

At present time, statistical data on patients, the work produced, and the resources applied is produced in the main informations system; the *Green System*. However, the extent and types of such operations have not been studied in the making of this report.

Medical information about psychiatric patients is collected on a national level. The institute of Demographic Psychiatry maintains statistical databases on the severe cases of mental illness in Denmark. This is done in order to map the cases of mental diseases within the country, but also to enable medical research of, for instance, genetic inheritance of mental deceases. At the present time in SHH such information is manually collected by secretaries, written onto paper based forms, and subsequently send to the institute. The ability to share medical data between the different EPR systems would benefit the demographic research.

Three types of purposes for the EPR technology seem to exist in parallel. Firstly, the technology supports the documentation of the work in a legal sense. Secondly, the EPR system is supposed to support the treatment, the work of the practitioners. And thirdly, EPR technology is supposed to enable actors, other than the primary ones, to collect information about patients, treatment, and resources.

In this and the previous sections, it has been stated that EPR systems, through their ability to actively process the information in them, can aid the practitioner and that they enable the practitioners to share information between them. Section 3 describes some of the requirements that medical work imposes on the systems. The descriptions of purposes in this section, however, has not shed much light on how the technology is related to the practice. The following sections will discuss the technological support of medical work.

The collection of informations are done for several reasons. I have shown how information is collected for research and managerial purposes. We have also seen, how the EPR system supports three concrete *Quality control* functions. In the following discussion of the electronic support of medical work, the relationship between the two purposes (the support of work and the productions of statistical data) are taken into account. It seems obvious that the two do not coexist without conflicts. This will also be discussed under section 7.

5.2 A reference model for clinical data

The Danish Ministry of Health is in the process of defining a standard structure for medical documentation. (The model is described in Ministry of Health, 2001) In present times the model is still under construction along side with the concrete EPR systems at the Danish hospitals. By its current position in the field, the model can best be understood as design guidelines, developed from experiences earned in the different ongoing EPR projects. But it is hoped that the model, in time, will establish itself as the reference model of the structure of medical documentation. The model is based on empirical information collected and experiments done at selected Danish hospital wards.

By using the model, I will be able to reflect on the design of the EPR system. Features included in Basic Structure, but not included in SHH's system can be hypothetically discussed on the basis of my observations on M6. In short, the Basic Structure will provide ideas to design features of a hypothetical system at SHH.

The model is very comprehensive and, thus, very complex. It is therefore not possible for me to fully describe the details of it in this report. As a consequence of this, situations might arise, where things are unaccounted for in the model. It is, however, it is my general opinion that the details are well accounted for in the model descriptions. It does indeed appear to be a thorough piece of work.

The data structure is built to support the documentation of the clinical process of a clinician. The authors of the model define a clinician in the following way:

The term "clinician" is chosen, which in this context means **any** health related actor, who are engaged in documentation regarded to a single patient. A "clinician" can, thus, be a physician, nurse, physiotherapist, occupational-therapist, psychologist among others.

Thus, the model is intended to be a "universal" model for the structure of medical documentation. The model defines a clinical work practice and it, thus, requires that all clinicians follow the same work procedure. The model allows different clinicians to write down different contents in each their documentation standards, but the structure of all documentation has to conform to the same *basic* structure.

The model described in (Ministry of Health, 2001) consist of two parts, a description of the *clinical practice* and a definition of the data structure model. (The data structure model will be discussed in section 6.1) The structure is derived from the descriptions of the medical practice. The data structure is, in other words, designed to support the proposed clinical practice. The fact, that the data structure is based on assumptions that a certain work and documentation practice puts requirements on the actual practice of the users of an EPR system. In other words, the users have to follow the work practice described in the model.

The model of the clinical practice is shown in figure 5.1. The overall principal of the model is that clinical work (and documentation work) is conducted in a circular manner through four different stages. At the first stage, the clinician performs what could be termed *Diagnostic reflections* (Dianostiske overvejelser). The patient's problems are defined at this stage and they are documented in the form of a hierarchy of *Diagnosis* (diagnoser).⁶ The second stage is the *Planning* stage. At this stage, a hierarchy of *plans* (Planer) are described: plans, which are all related to one or more of the diagnoses described at the previous stage. *Goals* (Mål) are further more defined for each of the described plans. At stage three, the interventions are carried out and documented. The products of this stage are a number of *Results* (Resultater), which are used in the fourth and final stage, the *Evaluation* (Evaluering) stage. The Evaluation stage is described as a mechanical process stage, where goals are compared to the Results. When Goals and Results are in a machine processable format, for example in the form of numerical test values, the process of evaluating can be done by computers automatically. The result of the evaluation is an

⁶The definition of diagnose is wider, than the traditional *medical* understanding of a diagnose. In the model, the diagnose is the problem, which the clinician has identified and focused his or her interventions on.

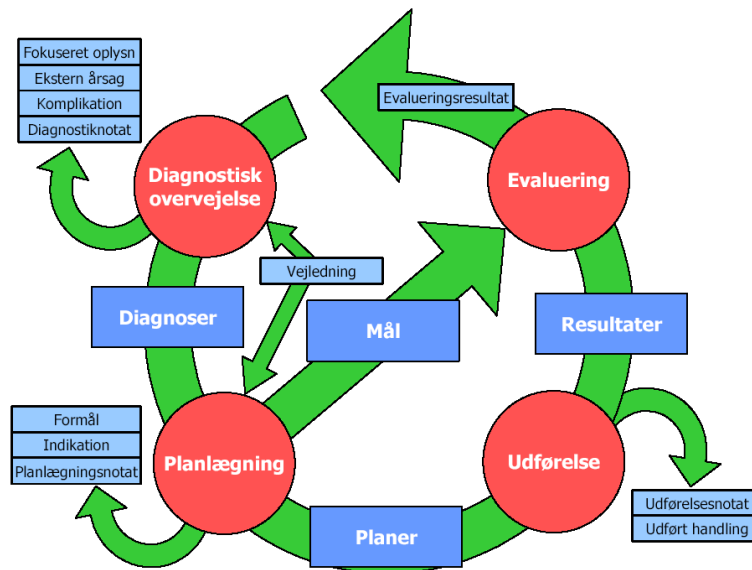


Figure 5.1: The assumptions on the clinical practice. (taken from Ministry of health, 2001)

Evaluation Result (Evalueringresultat), which can either be positive or negative. When the result is positive, the treatment is successfully terminated. On the other hand, a negative evaluation result leads to a continuing of the treatment. The evaluation result will then be further analyzed in the Diagnostic reflections stage.

At a more detailed level, the clinical process is also described using a data-flow diagram. This diagram is shown in figure 5.2. As the name suggests, this model illustrates the flow of data (medical documentation) during the clinical practice. The diagram is identical to the one described above, showing the four stages of the clinical practice: (1) the Diagnostic reflections, (2) the Planning, (3) the Interventions and (4) the Evaluation. The squares represent the different units of data during the course of practice. The diagram shows the units of information referred to above: (E) the Diagnosis Hierarchy, (J) the Plan hierarchy, (P) the Goals, (M) the Results and (K) the Evaluations results.

The arrows on the data-flow diagram indicate the flow of data. For instance, it can be seen in the diagram how the process of Planning is Dependant on the Hierarchy of Diagnosis (E). It can also be seen, how the process of creating Diagnosis involves a bi-directional information flow. This is because the process of attaching a diagnose depends on the previously attached diagnosis. There are two aspects to this dependency. Firstly, the actual attachment of a new diagnose is dependent on previous diagnosis, also in a medical sense. Secondly, a new diagnose has to be ordered in the existing hierarchy of diagnosis.

The Basic Structure is problem-oriented (Ministry of health, 2001, pg. 7). This can be seen from the diagram in figure 5.2. The Diagnosis, or the problems, are the basis of Plans, Goals, descriptions of Interventions and Evaluations.

As noted, the data structure described here is planned to, in time, serve as a reference to the data models implemented in the EPR systems at the Danish hospitals. More specifically, the Basic structure is meant to define the structure of patient data, when it is transferred between the different systems. The Basic Structure can, thus, be described as a set of minimum requirements to the data structure of the EPR systems. The systems can be more complicated in their design and they may differ from the reference model. In these cases, data will then have to be translated

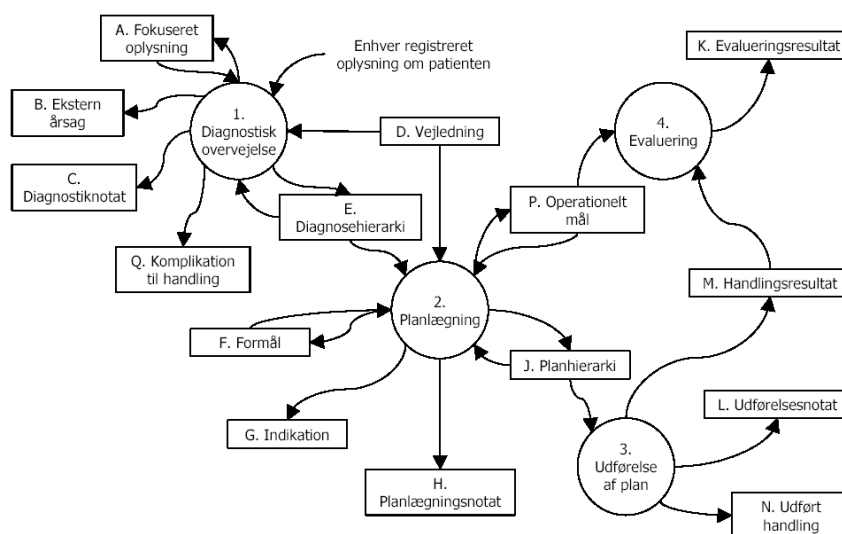


Figure 5.2: The data-flow diagram of the clinical practice.(taken from Ministry of health, 2001)

from the local form to the common data structure. (Bernstein et al., 2001)

The Basic Structure states that a medical description has to consist of a problem, a plan, operational goals set for the plan, a description of the interventions performed, and finally, an evaluation of the plan and interventions. On the other hand, the model does not describe the actual information in each category. The actual medical information can be defined by the medical personnel themselves. In fact, this is the central point of the Basic Structure. (eg. that it can be used to document the work of any clinician.) Said in simple terms, the model can be said to define the form of the documentation, without defining the content of the descriptions. The EPR evaluation report (Bernstein et al., 2001) states a desire to standardize the content of clinical documentation on a national level, but a discussion of this subject is beyond the scope of this report. I will deal with standardization efforts in the form of the Basic Structure; an effort focusing on the structure of the documentation, not the content.

At first glimpse, the EPR system at SHH seems to conform to the standards set by the Basic structure. The Plan of Treatment and the Nursing Plan, described in section 4.3, both contain a problem as the basis of the information in the plan. Likewise, they both contain a description of an operational plan and goals set for it, along with a required evaluation of the interventions. But they are not completely compatible with the Basic Structure. Where the documentation of the interventions is an integrated part of the Basic Structure, interventions are documented in separate note documents in the SHH system. The entries in the note documents are not connected to the the plans in a physical sense (implemented as references internally in the EPR system). Section 6.1 further discusses the relations between the EPR system at SHH and the Basic Structure for medical data put forward by the Ministry of Health.

Chapter 6

The integration of documents

As it was described in section 4 and its sub-sections, the documentation of the treatment is done using numerous documents. These documents are represented in two different medias, the electronic and the paper media. In this section and the following subsection, the relations between the different documents will be discussed.

Figure 6.1 shows an overview of the different documents used to document the treatment of the patients. The model shows how the two different plan documents are related to each other. In the Plan of Treatment document, problems and solutions are described under the *treatment* sections. The nursing plans addresses these problems and solutions, usually, in a more concrete and *situated* form (Nurses at Sct. Hans Hospital, Nursing department, 2001). When reading through the documents a clear connection between the descriptions in the Plan of Treatment and the ones in the Nursing plans can be usually established.

The clinical nurse of the M section describes the relationship between nursing plans and treatment plan in the following way: "Nursing plans should follow the plan of treatment. However, there can be problems defined in nursing plans, which are not mentioned in the plan of treatment. The nursing field is an independent profession." Because of this Nursing Plans, that have no relations with the Plan of Treatment, are sometimes defined by the contact person.

The plan of Treatment can call for several interventions, which then results in multiple Nursing Plans. The Figure also illustrates the difference between the Plan of Treatment and the Nursing Plan. The Plan of Treatment is revised through the course of treatment and the revisions are listed chronologically in the document. The Nursing Plan, on the other hand, is defined by a title (the problem in focus) and therefore, it does not contain different revisions. (When focus shifts, either the descriptions are adapted to the situation or new plans are defined.)

The Nursing Status documents function as a basis for writing Nursing plans. The descriptions in the Nursing Status document can be related to the descriptions in Nursing Plans. However, since Nursing Status documents are written prior to conferences, not all Nursing Status documents are related to the Nursing Plans. Like the Plan of Treatment, the different revisions of Nursing Status descriptions are listed chronologically in the document.

The different note documents all contain note entries listed chronologically according the time of their writing. The note entries are often related to the other documents. For instance, a plan can call for observations. This will result in note entries that are semantically related to this plan.¹ In the same way, note can also describe important observations, which are then referred to in plans or a in a status document. (Important observation may lead to the definition of new plans.)

The descriptions in the electronic documents are also related to paper based documents and

¹The entries produced in the following period will address this plan.

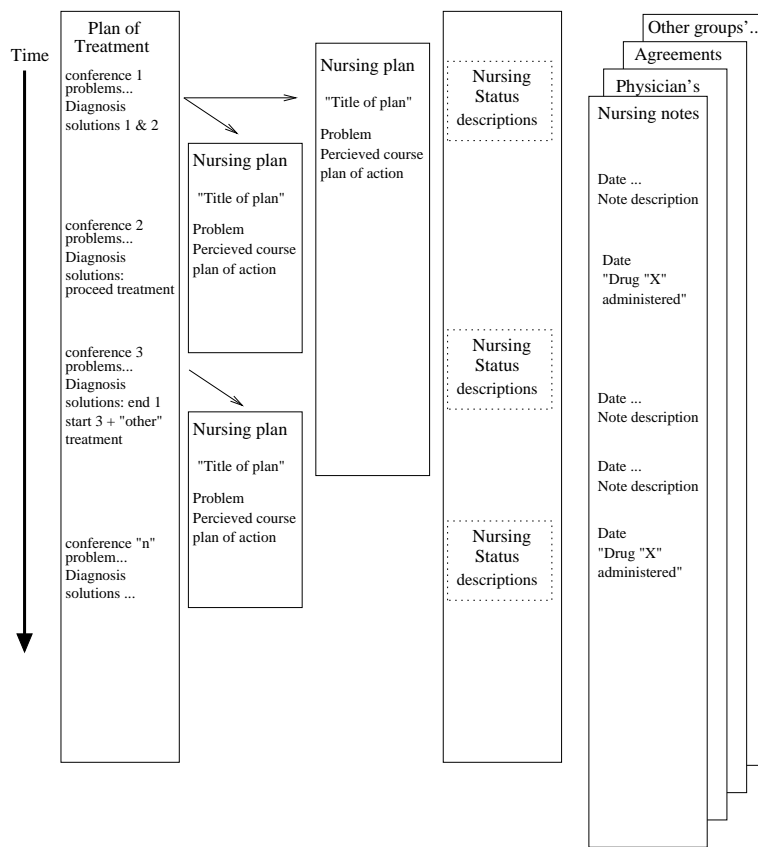


Figure 6.1: Model of the documents, documenting the clinical process

artifacts. For instance, the paper record might contain official letters or tests that are referred to in the EPR system. The calendar contains planned tasks, such as, ordered tests or scheduled treatments. These tasks will often be mentioned in the electronic documents.

Patients also produce documents as part of their treatment. Some of these documents are produced in conjunction with the treatments and therapies. Other documents play a part at the conference and when nurses write status documents.

The patient's document binder constitutes the patient's *documentation system*. The different documents collected in the folder describe the patient's Work ² during the hospitalization. As noted earlier, the patient can use the documents to track changes in his state of health. Some documents are further more an official part of the staff's documentation. The Patient's Conference form is such a document. It is both used by the patient and at the conference. It can therefore be argued that two different documentation systems exist on the ward; the patient's system, and the staff's.

The descriptions in the documents in the two systems are related. Just like in the case of the electronic plan documents, the patients cognitive forms will address the same problems as the nurse's documents in the EPR system.

The total documentation system, therefore, consists of multiple different documents that are semantically related. The relationship between the documents is a textual and semantic one, which means that the reader is responsible for establishing the relations between the documents. The EPR system does not offer any means to link information in the different documents. The paper based forms do not contain any predefined fields, in which references can be written. (The check field on the Patient's Conference form is the only exception to the rule.)

The nature of the documentation system results in two different types of problems. Firstly, the different documents have a different visibility and accessibility for the users. Secondly, the means available for linking descriptions can potentially result in inconsistency in the documentation system.

The Patient's Conference Form illustrates the problem of documents having a limited visibility. The general principle is that the patient keeps his documents in his binder, including the conference forms that he fills out during the course of treatment. The patient's information is, therefore, not directly accessible to the clinicians. From a treatment perspective, the principle of the patient keeping his own documents is a necessity. In order to be able to work with his papers, the patient needs unrestricted access to them. Furthermore, because the information in the papers are of a very *personal* nature, they cannot be entered into the EPR as a *shared* resource of information. The contact person has a restricted access to the documents, in that, she can ask the patient to see certain forms. She also takes part in exercises with the papers with the patient, and she discusses the result (the information in them) with the patient. The clinical management in the managerial department of the M section, on the other hand, have no access to the patient's documents. Because of this, special procedures for handling the documents have been developed. For instance, the Weekend Leave Form is entered into the EPR system and the Patient's Conference Form is brought to the conference. ³

The problem of inconsistency is illustrated in the use of the calendar. Dates are written in many different artifacts. They are written in the EPR system, in the calendar, on the conference schedule, and other document used by the staff. Sometimes the same or related entries (appointments, ordered tests, and the like) are written on several documents at the same time. This is, for instance, the case with examination planned at the conference. In this scenario, a test or examination might be ordered and at the same time a new conference ⁴ is scheduled. Subsequently dates will be written into the EPR system, the conference schedule, and the calendar. If for some reason the date of the examination changes, all of these dates have to be changed. This procedure

²The therapy sessions and the exercises, which they is working on

³In the case of the Patient's Conference form, it has probably been the other way around. The staff needed a document, which could account for the patients views at the conference. Secondly, the form can also be used by the patient in his treatment.

⁴where the results can be discussed at

is error prone. A nurse describes the problem in following statement: “A lot of the tasks we have to do, are written into the blue Binder [the calendar]. It might be more appropriate, if they were written directly into the EPR.”

The following section will discuss the concept of linking information between documents. Such a functionality will help to ensure a consistency in the documentation system (That documents referred to actually exist.) The functionality, possibly in the form of a hyper-linking technology, will also enhance the visibility of the documents in the system. Section 8 and its subsections will further discuss the integration of information across the total documentation system. In particular, the integrating between the two media, the electronic and the paper media, will be discussed in these sections.

6.1 Linking information in documents

The Basic Structure defines a precise grammar for the clinical documentation. This enables sharing of data between systems, a very important requirement described previously in this report. But Basic data Structure also seems to have some advantages over the EPR system observed at SHH, when it comes to its ability to support the work practice. More precisely, the Basic Structure seems to have two features not available in the EPR system. The Basic structure allows an explicit linking of data elements within and between documents.⁵ The design of the Basic Structure also integrates information on time into its design. A system built on the principles of the Basic Structure would, therefore, offer support of the coordination of the work practice. This differs from the ERP system observed, which must be characterized solely as a reading and writing artifact. This section will discuss a possible coordinative support of practice.

The Basic data Structure is described using the UML language. Figure 6.2 shows an overview of the data structure.⁶ Both the data-flow diagram, showed in figure 5.2, and the data structure model are abstractions of the observed clinical process. The data-flow diagram is a generalized model of the clinical process. The diagram describes both the work process of the clinician and the information/documentation produced during this process. Whereas, the Data structure is designed to support the model of the clinical practice; it only defines the structure of the data. The two models are, therefore, not identical. The data entities described in the two models differ, just as terms used to name them have been changed.

The data structure can in a simplified form be explained as follows:

Again the diagnose (*Diagnose*) is the central entity in the model. Several diagnoses can exist and these can both be related and unrelated to each other. The relations between diagnosis are described in the relationship between diagnosis (*Sammenhæng mellem diagnoser*) class.

The intervention (*Intervention*) class contains the documentation of interventions. The Intervention class represents both the planned intervention and the actual intervention, which is carried out in the treatment. Again here, several related interventions can exist. A treatment will often require a series of interventions and each intervention will then have to be documented. All interventions will, at the same time, be related to each other. The intervention-plan will obviously also be related to a number of (carried out) interventions. The relation is described in the relationship between interventions (*Sammenhæng mellem interventioner*) class.

⁵The document, as an information entity, does not exist in the Basic Structure model. This makes the statement somewhat imprecise. But if we imagined that the EPR system in its present form was built on the Basic Data structure. (i.e. that the underlying data structure of the system resembles the principles of the model.) Then, such a system would enable the user to physically link data stated in one document with data in another one.

⁶ In Ministry of health (2001), the model is described in further details, than is shown here. Other diagrams show the relationship between groups of selected classes. The diagrams also show the attributes of each class (The data in them) and dependencies between each class. Each class is also described in detail in the report.

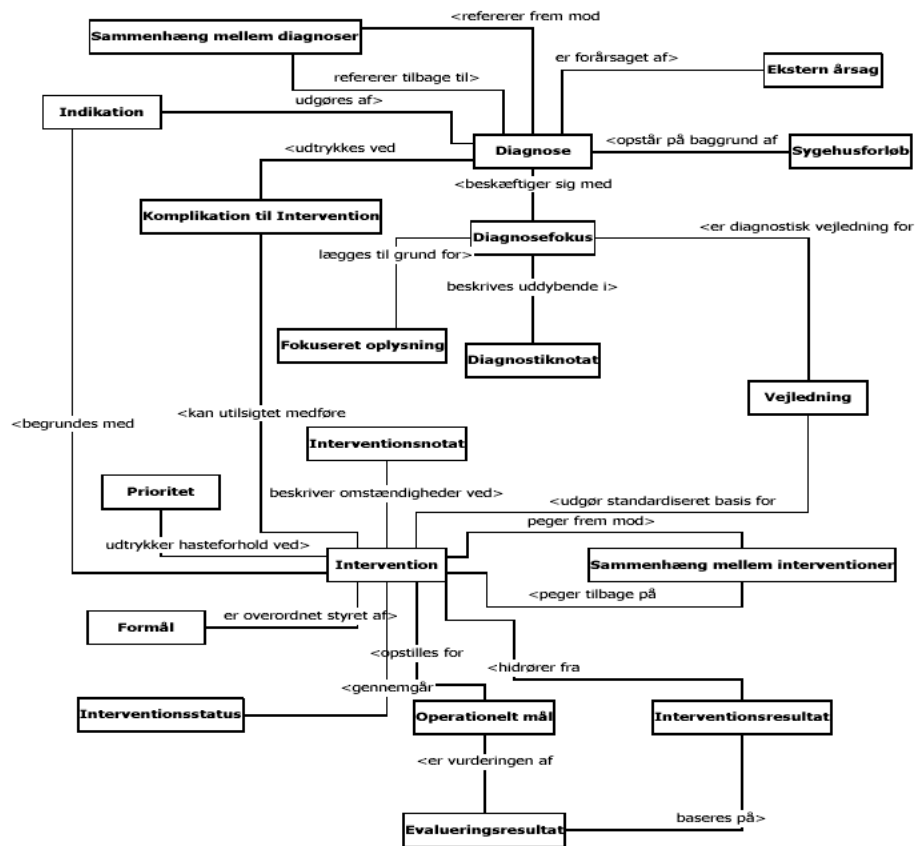


Figure 6.2: An overview of the Basic data Structure.

Interventions are related to diagnosis through the Indication class (*Indikation*). In the words used in the model description, the reasoning behind the Intervention is given by the Diagnose through the Indication. The Indication class is a simple connecting class that defines the time span, in which the Intervention and the Diagnose is related. The Intervention Note (*Interventionsnotat*) describes the intentions of the intervention. The Intervention Note can both be in the form of a plan note and an intervention description (depending on the type of Intervention, to which, it belongs). Plan notes are written prior to the occurrence of the intervention. Intervention descriptions can be written at the time of the intervention or after.

An intervention results in an Intervention Result (*Interventionsresultat*) The Intervention Result is a textual description and/or numerical values measured after the occurrence of the intervention.

Operational Goals have to be set for all Interventions. The Operational Goals are defined in the *Operationelle mål* class. This class describes the criteria for a successful series of interventions, the time-span in which the interventions are performed and other type of information necessary for evaluating interventions. Operational Goals always have to be described for a series (or a single) interventions. By comparing the criteria described in the Operational Goals with the Intervention Results an Evaluation Result (*Evalueringresultat*) is produced.

The Basic structure has two main advantages over the EPR system at SHH. Firstly, the data structure incorporates information on time. The Intervention entities contain time information. Intervention entries describing plans contain information on when actions (actual interventions) have to be carried out. An EPR system built on these principles could therefore assist the staff in coordinating the treatment of the patients. The system will be able to produce reminders to the staff, in order to ensure, that planned interventions are actually carried out. Taken even further, the system could be designed to incorporate a *work planner*, a section in the program in which the tasks of a staff member would be listed. The staff members could then use the system to plan their day. Secondly, the data structure and the elements in it are described with great detail and precision. A very detailed description is necessary, if an attempt on standardizing the data structure is to be successful. The precise grammar of the medical data further enables sharing of information and explicit linking of information within the EPR system.

The EPR system currently used in SHH does not contain any time planning functionality. As noted earlier, the primary artifact used to coordinate the work on M6 is the calendar, the blue binder, in which most planned tasks are written. An example of tasks written are blood tests ordered at the conferences. Usually, a series of tests are ordered and this means that the tests have to be taken over a specified period. At M6 the tests are usually noted in the blue binder and at the same time they are written into the Plan of Treatment.⁷ The notes in the calendar will then help to ensure that the blood samples are collected. The result from blood analysis, performed at the in-house laboratory, will automatically show up in the Lab-Result module in the EPR, when analyzed by the technician. (The laboratory enters the information into the system and sends a message to the ordering doctor.) According to the staff, it does occasionally happen, that blood-samples are never collected or that only the first sample in a series is collected. This can happen when the ordered test is only recorded in the Plan of Treatment but not written into the calendar at the same time. A coordinating functionality integrated within the EPR system would, according to psychiatrists and nurses on M6, help to ensure that tasks are not forgotten. Details about ordered test would only have to be recorded in one place.

However, the Blue Binder contains both clinical and other more practical tasks, such as the ordering of linens or meals from the kitchen. The latter type of tasks does not fit logically into an EPR system. First of all, because such practical tasks do not make sense in a clinical documentation. And secondly, because they can not be related to specific patients.

Another problem of integrating a coordinative functionality into the EPR system has to do with the users of the coordination artifact. The Blue Binder is currently used by all of the nurses on M6. In particular, it plays a central role in the coordination of tasks at the staff meetings. The

⁷Tasks, such as tests, might also be documented in the other documents in the EPR system

coordination suggested here, is foremost thought of as a personal organizer. Further thoughts will have to be put into the design of a coordination system, which can serve the coordinative needs of the individual staff member, as well as, the needs of the work group as a whole.

Another time related benefit from the Basic data Structure is, that the integration of time information in the data-entities enables an automated evaluation. The system is able to automatically evaluate the interventions performed. In other word the data structure enables a degree of automatic machine processing. As noted, the Operational Goals state both the criteria for a successful series of Interventions and the allowed time-frame for the planned treatment. The system will, because of this, automatically be able to determine whether a series of interventions have achieved the defined goals. In the case, where the planned interventions have not been carried out, the system will automatically be able to determine this too. From a managerial point of view, such a system offers a support to perform *quality control* procedures. The system will automatically be able to answer two very important questions: Is the planned work actually carried out, and if so, do the interventions actually achieve the goals set in the planning process. As mentioned earlier, the EPR system used at SHH currently supporta a very limited part of this functionality.

The EPR system at SHH seems to be designed to resemble paper based document handling. The system was originally designed at the Karolinska University Hospital in Sweden. The term *document oriented* seems to best describe the VIPS model of documentation, as it presents itself in the literature and in my observations. The basic entities of information are the different documents, the Nursing Status and the Nursing Plan. These documents have a well defined structure, in which the data and information is fitted in. Because of this, it could be argued that the basic unit of information is the information is the sections in the document. But both the structure of the documents as well as the system's handling of the documents, in my view, support the whole document as the basic unit of information. The Nursing Plan functions as a whole. The different sections relate implicitly to each other. For instance in the Nursing Plan, the focused problem description is related to the nursing diagnosis. The same diagnosis is then again implicitly related to the goals and plans for the treatment. Separating the sections from the document and each other does not seem possible, at least with the present structure and form of the documents.

The Plan of Treatment, written by the psychiatrist is document oriented. The descriptions in the sections are all produced at the same time and they are implicitly related to each other. Again separating the sections from the document is not possible.

The Note documents, on the other hand, differ from the others. In the note documents, the basic information unit is the note-entry. The entries in the nursing document are not necessarily semantically related to each other. On the contrary, they are different descriptions collected in the same document. Some may be related to each other. For instance, the nurse might document a series of observations of a certain patient's behavior over a period of time. But other entries, such a description of a *potentially interesting* incident on a shift, are unrelated to the other entries in the document. The PN medicine note, a special nursing note, is another example of a note which is not directly related to the other notes in the nursing Note-document. Thus, the note documents cannot be understood as document oriented. Rather, they must be seen as a sort of *collections*, containing both entries that are semantically related and entries which are unrelated to the other. The only structure in the document is the chronological ordering of the entries.

The EPR system at SHH does not support any explicit linking of information between the information in the documents. A *hyper text* functionality in the system could potentially be very useful. Such a functionality would enable a clinician to reference other documents in the system. For example, a nurse would be able to explicitly link her descriptions and diagnosis to the overall plan and problem descriptions in the Plan of Treatment. The Basic data Structure, with it's well defined units of data, seems to support such functionality. In the Basic Structure, both the nurse's diagnosis and the Psychiatrist's diagnosis are based on the same Diagnose class. The nurse will therefore be able to refer to both Nurse's and psychiatrist's diagnosis in her Intervention-plans. (The Intervention class used for the nurse's documentation and the psychiatrist's documentation are the same.) I would not expect the EPR system, currently used at SHH, to be modifiable

to support an explicit linking functionality. When the document is the basic unit of information, then the structure of the documents will blend in with the content of the sections (the descriptions). In other words, it will be difficult to separate the structure of the documents from the information in the sections. The fact that the administrators at SHH are able to alter the structure of the documents, supports the notion that the structure of the documents must be understood as a part of the the information within the documents.

For these reasons, I would expect it to be very difficult to implement a referencing system, which would be able to preserve links between sections in modifiable documents. Further more, this discussion also gives some indication of the problems which can be expected, when the data in the SHH EPR system is to be integrated with other systems (using the Basic structure for medical data as reference). The two data structures do not seem to be readily integrable. An interface between the two structures, it seems, must demand a well defined and stable internal structure of the documents in the EPR system.

Further studies into the design of the EPR system are necessary to determine the design principle of the structure of data on the database running the EPR system and consequently, to discuss similarities and differences between the data structure of the EPR system and the Basic data Structure.

Adapting the *document metaphor*, which seems to be a central design principal of the EPR system at SHH, might have been a logical step away from the paper based reports. The system was designed to replace paper based records at the Karolinska University Hospital. The adaptation of the document metaphor might have made the system more intuitive and easy to handle for the users (the staff). They are familiar with paper documents and, thus, they are readily able to understand the design principles of the system. The data entities of the Basic structure might be more difficult for the clinicians to understand. With the basic Structure, instead of filling out a paper, electronic or not, the user has to connect different pieces of information to each other.

In order to be able to judge the value of an explicit linking functionality in the EPR system, further analysis of medical documentation are needed. Two different analyses of medical documentation are relevant to include in such a discussion. The first one is *Good organizational reasons for 'bad' clinic records* by Garfinkel (1967) and the other is Heath and Luff (1996).⁸ The texts have two main arguments. Firstly, medical documentation is not precise descriptions, but instead, it requires of the reader to interpret the descriptions in order to form his or her understanding. Secondly, medical descriptions are distributed. No single entry in a medical description can be understood on its own. The reader has to piece together the different entries in order to form his or her understanding.

Medical descriptions are not complete and adequate accounts of the situation, which they describe. They therefore require interpretation. Heath and Luff (1996, pg. 4) describes medical documentation in the following way: "It is not so much a précis of what went on, but rather a sketch, drawn through a few elements which provide a certain sense or impression of of the event." Therefore, medical documents rely on the competence of the readers.

Garfinkel lists five important qualifications, which a reader of clinical documentation must possess in order to be able to understand the texts:

In order to read the folder's contents without incongruity a clinic member must expect of himself, expect of other clinic members, and expects that he expects of other clinic members they expect him to know and to use a knowledge (1) of particular persons to whom the records refers, (2) of persons who contributed to the record, (3) of the clinic's actual organization and operating procedures at the time the folder's documents are being consulted, (4) of a mutual history with other persons—patients and clinic members—and (5) of clinic procedures, including procedures for reading a record, as these procedures involved the patient and the

⁸Garfinkel studies a psychiatric practice. This makes his result comparable to my observations on ward M6. Heath and Luff studies a general medical practice, but their findings are comparable to the ones of Garfinkel, which also make them relevant in this discussion.

clinic members. In the service of present interests he uses such knowledge to assemble from the folder's items a documented representation of the relationship. (Garfinkel, 1967, pg. 206)

The quote shows how writing and reading documents is in deed a collaborative task between the reader and writer of medical documentation. The somewhat cryptic statement pinpoints the reader's and writer's reciprocal relationship. The reader has to expect that the text is intended to make sense for him. The writer on the other hand has to expect that the reader will be able to interpret his intentions. The reader and writer must therefore share some common knowledge. They must have a common knowledge of the subject being discussed, the patient and treatment. Furthermore, they also have to have a shared knowledge of the clinical practice. In other words they must have a practice experience.

Medical descriptions are also distributed over time and different documents. According to Heath and Luff (1996), entries in medical records function as a whole. One entry does not present the information on its own.⁹ For instance, previous entries will often have to be taken into account, when the information of a current entry has to be understood. A diagnosis will often not be repeated. Because of this, a treatment documented in an entry might refer back to a diagnosis stated earlier. It is left to the reader to infer the relation between the diagnosis and the treatment. The arrangement demands a skilled reader, because the reader himself has to gather the pieces of information in order to form an understanding of the patient and treatment. This organization of descriptions makes the documentation practice an economic one. In short, he does not have to repeat his descriptions. And furthermore, he does not have to explicitly state the relationship between entries.

Heath and Luff use the term *defeasibility* to describe this nature of medical descriptions. "The term has been widely used in pragmatics and jurisprudence to describe the ways in which any rule or law, no matter how precise its formulation, will inevitably confront circumstances, where despite their potential relevance, it is inappropriate. (Heath and Luff, 1996, pg. 3)" Medical descriptions can be said to be *defeased* in two ways. They are incomplete and thus, have to be interpreted. Medical documentation can also be said to be defeased in that they are distributed over several entries.

The nature of medical organization provides two advantages for the practitioners. Firstly, Garfinkel (1967) argues that the use of implicit linking enables an economic documentation practice. Arguments, previously stated, do not have to be repeated. Instead, the writer relies on the reader to be able to relate arguments to previously stated information. Secondly, the spreading of information units in medical documentation, according to both Garfinkel (1967); Heath and Luff (1996), further more has an advantage for the reader. The distributed nature of medical documentation helps to give the reader an impression of the development and changes in patient and treatment. In the words of Heath and Luff: "By defeasing items across entries and assembling the text with regard to an impression as to how this event is related to previous meetings concerning the particular illness, doctors produce careers or trajectories of illness." (Heath and Luff, 1996, pg. 5)

An observation of mine, which supports this view is the task of *reading up on a patient*. The nurses on M6 have often used the expression "reading up on a patient" in describing the process of familiarizing themselves with the patient and the state of the treatment. Nurses read up on patients at several occasions: When new patients arrive, the contact person reads through the documents from transferring hospitals and institutions. When a nurse returns to work after a longer break, they will often read up on the patients on the ward in order to learn of changes that have occurred while she has been away. Patients are also "read up on" regularly. Morning reports are structured on the basis of notes created while reading through the documents on the patients on the ward (in the EPR system).

⁹Heath and Luff quote Gurwitsch for the concept of *Gestalt contexture*. This term describes the phenomenon, that a number of related parts in the totality defines a unity. In the case of the clinical documentation at SHH, the many documents together form the total documentation written on the patient. And on a smaller scale, the many entries in a note document described a development in the treatment of the patient.

Heath and Luff (1996, pg. 5) argues that “By designing an entry so that a colleague turns to read other, related entries, a practitioner provides a sense of the career or course of a particular illness and the ways in which various consultations featured in its development.” My observations supports this view The act of reading up on a patient provides the nurse with an understanding of the state of the treatment and patient, as well as, a coherent understanding of development of the two issues.

In sum, the Basic data Structure provides some advantages over the EPR system used at SHH. The fact that the Basic Structure defines a very precise grammar for the medical documentations is the main reason for the difference between the two. The Basic Structure integrates information on time into the medical data and because of this, the structure also has a potential ability to support the planning of the work of the clinicians. The precise grammar is a premises for enabling sharing of data across documentations systems; one of the goals of the Danish EPR approach. On a smaller scale, the precise grammar also enables linking of the description in the different documents in the system.

The linking technology can serve to improve the visibility of the information in the system. However, special considerations should be made when designing such a system. In theory the linking technology would make it possible to create an interface, able to present *all relevant information in one place*. For instance, when requesting a particular Nursing Plan, the system would also include descriptions from the plan of Treatment in the same. However, This would not be an ideal solution. The interface should instead allow for the user to navigate through the information in the system. The hyper-links can enable an easy navigation through the documents.

Chapter 7

Plans and practice

This section of the report will discuss the relationship between planning activities and practice. In other words, how do the clinicians, nurses, psychiatrists, and others plan their work activities? Secondly, this discussion will provide some concrete details on how the documentation artifacts, primarily the EPR system, are to support this planning. To answer the questions, the planning activities in nursing work will be discussed. I will describe how the nurses use the documents of the EPR system to plan their work.

The EPR system is not just used to plan the work of the clinicians. The documents in the system also serve other purposes. Because of this, section 7.2 will discuss the documentation activities as activities that serve multiple purposes.

First question that has to be answered is, What is a plan? Plans are foremost the descriptions, made by the nurses and psychiatrist, which describe the future treatment of the patients. The Plans of Treatment and Nursing Plan are examples of such plans. Planning activities can also be understood as more abstract categories than just the writing of specific documents. Basically all activities require some level of planning. For instance, the daily ward meetings are planning meetings, in where the activities of the day are coordinated. The visitation meetings and conferences are also examples of fora, where the activities are planned for a longer duration of time. These examples also show how coordinating activities are also planning activities.

The time span covered by a plan is an important factor when distinguishing between planning activities. In the analysis in this report, I have chosen to distinguish between planning activities with shorter and longer time spans. This section will discuss plans that run over a longer period of time. (Section 8 Will cover some of the aspects of coordination activities, such as meeting activities.)

Many different plans exist within the field of work (ward M6). All of the professionals involved in the treatment of the patients make plans and as noted earlier, the patients also make plans for their daily activities. This is a cornerstone of cognitive therapy. The discussion in this section, however, will concentrate on the plans made by the staff members.

Plans are related to Standard Operating Procedures. As noted in section 3, medical work is managed with the use of articulation work and SOPs. Plans resemble SOPs in two ways. Firstly, practice members rely on SOPs when they make plans for their work. For instance, the clinical documentation practice, (examples described in Ministry of health, 2001 or Nurses at Sct. Hans Hospital, Nursing department, 2001) is an example of a SOP, describing the procedure for making plans. Secondly, the actual plan becomes a SOP, when described in the system. The plan describes how the work is to be conducted in a future period.

The relationship between the plan and the practice which it describes has been the focus of much research within the field of CSCW. Through empirical studies, researchers have tried to determine in what way *the plan can be said to stipulate the practice*. Suchman (1987) holds

a central position in this debate. In her book, she strongly criticizes the present (at that time) understanding of plans as mental constructs, constructs that precede and stipulate human activity. The cognitive school of thought was the dominating theory on human activity within the field of computer science at that point in time. The conclusion from her study marked a turning point away from the cognitive theories, moving toward theories that understand human activity as something which is situated in concrete interaction situations.

Just as it would seem absurd to claim that a map in some strong sense controlled the traveler's movements through the world, it is wrong to imagine plans as controlling actions. On the other hand, the question of how a map is produced for specific purposes, how in any actual instance it is interpreted *vis-à-vis* the world, and how its use as a resource for traversing the world, is a reasonable and productive one. (Suchman, 1987, pg. 189)

Suchman sees plans as *resource for actions*. Plans do not describe reality. They do not describe the practice in a (complete) detailed sense. Plans have to be interpreted in any concrete practice situation. They are simplifications, and therefore, they do not describe all aspects in a concrete practice situation. Secondly, plans are generic descriptions that always have to be adapted to the concrete practice situation.

The arguments of Suchman are in line with my descriptions of medical descriptions. For instance, Garfinkel (1967); Heath and Luff (1996) stress the incompleteness of medical descriptions. The dismissal of the cognitive theories behind expert systems, argued by Berg (1997), also relies on the notion that medical treatment can not be "planned once and for all", but have to be managed through out the course of the treatment.

The discussion in the following sections understands plans as resources for actions. The discussion will try to further describe how plans are used by the staff to help manage the treatment of their patients.

7.1 Plans and nursing work

This section will discuss the planning activities of the nurses. The planning of the treatment is, first of all, a cooperative activity. Nurses discuss the treatment of the patients with each other and they are all in contact with the patients. But planning is also done by the contact person alone. The planning work results in the formulation of a plan covering a selection of the aspects of the treatment.¹ My research has identified two different ways, in which the documentation tool (the EPR system) is used to support the planning activities. These two ways will be presented here. Following this, the abilities of the EPR technology in supporting these activities will be discussed.

My discussion of planning activities focuses on the work of the nurses. There are two main reasons for this. Firstly, because I have spent the most time observing the practice of the nurses, my empirical data primarily describes their part of the total practice. But secondly and more importantly, problems with the documentation activities of the nurses actually seems to exist. In many wards, Nursing Plans and Nursing Status documents are not written to the extend they ought to be.

This is argued by the EPR coordinator, as well as, by the clinical nurse of the M section. According to the clinical nurse, the M wards do not live up to the requirements for the documentation set by the clinical management of SHH²:

¹Needles to say, plans only covers a fraction of the total work conducted by a clinician. Much work is done *ad hoc*, when needed.

²This arguments contradicts the findings of an official evaluation report of the use of EPR. A report evaluating the use of EPR at ward U7 (the first ward to receive the system) a year after the implementation of the system (Fischer & Lorenz, 1999, pg. 1).

The clinical nurse has evaluated the documentation of the work practice on M6. The “first” Nursing Plan is missing on most patient records, as are other Nursing Plans and evaluations of these. According to the clinical nurse, the present state of documentation is lower than it was at an evaluation done two years ago, just prior to the implementation of the EPR system. The poor state of documentation is not a unique problem on M6. The same problem exists on all of the other M wards. The nurse backs this argument with concrete data from evaluations done on M3. (A clinical nurse of the M section at a “documentation training session” on M6)

The clinical nurse works with the nursing staff on the different wards to help them with their documentation practice. She usually works by training selected nurses who produce inadequate documents on their patients. During the training period, she will read the documents written on one or more of the nurse’s patients. She will then provide feedback to the nurse with the strengths and weaknesses of the documents, as well as, giving the nurse the opportunity to ask her questions.

The clinical nurse finds that her interventions usually raise the level of documentation of the entire ward significantly, and this usually leads to an adequate level compared to the requirements set by the clinical management. However, the training only has a temporary effect. In the period following the training, the level of documentation gradually drops to the low base level again.

Three obvious explanations to this problem seem to exist. Firstly, the Nurses might not have the needed qualifications to use the tools and procedures in the planning of their work. Secondly, the tools might not meet the needs of the nurses. Thirdly, the problem might be explained by the fact that the nurses do not need the planning tools to plan their activities. The following discussion in this and the next section will address this question.

The skills of the staff is a relevant factor for being able to produce high quality documentation. According to both the clinical nurse and the EPR coordinator, the quality of nursing documentation varies greatly across the wards at SHH. Not all nurses³ are capable of writing high quality documentation. One possible explanation of this is, according to the EPR coordinator, that the production of documentation is still a relatively new activity in the field of nursing. Some nurses have not had the proper schooling in using and producing medical documentation.

However, this does not appear to be the explanation of the problem observed on ward M6. The clinical nurse argues that the staff on M6 hold a very high professional level and are perfectly capable of writing good documentation. “When you [the staff on M6] write documentation, it is perfect. This is not the case in many other wards. In many cases nurses write too many unimportant details, or they may leave out key information.”⁴ The qualifications of the user of the documentation system are important, but they are not the main explanation for the low level of documentation found on the patients on ward M6.

As described earlier, the documentation procedures are based on the VIPS model of nursing documentation. The VIPS model of documentation is based on an assumption of the way nurses work. Figure 7.1 illustrates the stages in the (standardized) practice of the nurses. The documents in the EPR system are designed to support this work practice on the wards.

The nurse’s work starts with the “anamnese”, the initial description of the patient. This is the phase, where the nurse gathers relevant information about the patient (by observing, talking to, and reading about the patient). This leads to a description of the patient (the Nursing Status). The Nursing Status is used as the foundation, when producing the the plans. (The circle represents the stages of the Nursing plan. The different stages relate to the overall sections of the Nursing Plan document.) Nursing Diagnosis (identified problems) are defined from the descriptions of the patient. Each diagnosis defines a Nursing Plan. Following the diagnosis, the goals of the treatment are set and interventions are planned. After interventions have been performed, the

³And other groups of professionals involved in the patient care.

⁴while stating this argument, the clinical nurse illustrated her point, with examples from documents written by one of the nurses at M6.

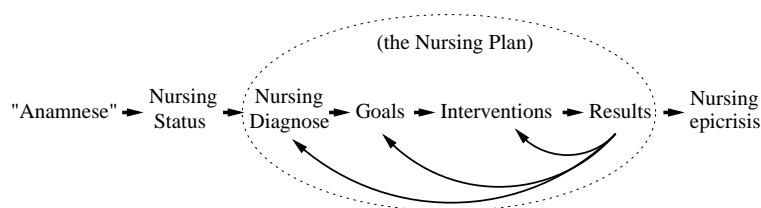


Figure 7.1: Simplified model of the nurses work (Adapted from the SHH manual of nursing documentation(Nurses at Sct. Hans Hospital, Nursing department, 2001))

results are evaluated (In the evaluation section of the plan). An evaluation can lead to the closing of the plan, because the goals have been achieved. It might also lead to the description of a different plan, if the current problems call for a different approach (A different diagnose) Finally, the evaluation might show a need for adjusting the goals and planned interventions. When the goals of a plan are met (When the treatment is done), the nursing epicrisis is produced.

It should be noted that several Nursing Status documents are written during the course of treatment. These are written prior to conferences or when changes in the state of the patient call for it. However, figure 7.1 does not show this. In both cases, the Nursing Status document is described as the starting point when defining or rewriting the plan.

The note document is not part of the VIPS model. They are added to the modified version of the model made by the clinical management at SHH. In VIPS, notes are written under the *Interventions* section in the nursing plan. From my opinion, this makes the interventions an integrated part of the plan, where as in the SHH variant, to a large extent, they are documented in the notes section. In the SHH model, the treatment of the patient is planned in the *Interventions*, but the actual actions (carried out ones) are documented in the note document. At the time of evaluation, the actions are then summed up in the evaluation section of the plan. My observations clearly indicate, that this organization turns the Nursing Plan in to a document secondary to and separated from the work practice.

Thus, the separation of the documented intervention from the plan document might be a possible reason for the low number of productions and revisions of Nursing Plan documents. Because the plan is not used to write daily notes in, the nurses do read their plans on regular basis either. Therefore, they are not urged to revise them either.

The VIPS model of nursing practice resembles the one described for the Basic data Structure. They both go through a similar set of stages, going from the definition of problems to the evaluation of interventions. They both describe clinical work as a circular process. The clinical procedure of the Basic data Structure also defines the documentations of interventions as an integrated part of the model. (There is no detached note class in the Basic data Structure.)

The clinical practice can also be understood in a different way, than described in figure 7.1. Rather than producing a prospective description, the plan which stipulates the future practice, the nursing plan can also be seen as the result of a more *reflective* practice. According to a nurse, plans are sometimes written after a period characterized by a more *ad hoc* treatment and note-taking. The nursing plan can here be understood as the result of a reflective process, where the nurse observes for a while, sits down *to think things over* and subsequently expresses her understanding of the problems and solutions in the plan. Figure 7.2 illustrates this understanding of the documentation practice.

In this understanding of the planning practice, the plan then stipulate the future work. But the central notion in this understanding is, that the notes are closely tied to the work practice, and the writing of the plan is something which follows practice experiences expressed in the Nursing Notes. The Nursing Status Descriptions follow from the knowledge collected during the work with the patient and supports the production of the plan.

The following example told by the same nurse illustrates the reflective work practice:

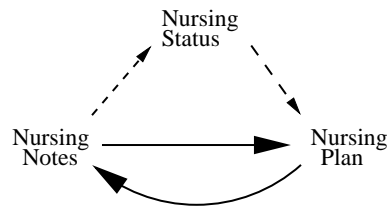


Figure 7.2: the reflective process of writing nursing documentation.

“I once had a patient, who was transferred from another ward. Something was wrong with his Nursing Plan. It stated that the patient was an alcoholic (mis-bruger). But he did not seem to be one. He felt no ‘need’ for alcohol on a regular basis. On the other hand, being in, or getting into in a difficult or unpleasant situation would make him feel an urge to drink (To escape from problems)... I was not able to express the problem in a single term. It took some time until I was finally able to rewrite the problem description on the nursing plan.” (Interview with a nurse from M6)

Another example, supporting this view on the work practice, is the *official* procedure for documenting the first period of the stay on the ward. According to the documentation manual at SHH, the first Nursing plan routinely calls for gathering of information and observations on certain types of behaviors of the patient. When an adequate understanding of the problems has been established, the nurses are then expected to be able to make a plan for their work with the patient. Again, the process of building an understanding of the problem is a process which follows a period of work.

In the reflective understanding of nursing practice, the documentation artifact supports the reflective process. Besides from being the medium in which the plan is documented (as it was the case with the other model for nursing practice), the documentation artifact also functions as the medium, on which the user can write down his thoughts. This view is also stressed by Sellen and Harper (2001, pg. 63). They argue that in *knowledge work*⁵ “...it is *the process* of taking notes that is important in helping them to construct and organize their thoughts.” The documentation artifact must therefore support this reflective practice.

The existence of the two different work planning practices, the prospective planning and the reflective one, puts an additional requirement on the EPR system. It must allow for plans to be made both before and after the interventions are actually carried out. The EPR system at SHH technically supports this. The Nursing Plan is a simple document and because of this, there are no practical problems in writing the plan after the inventions are carried out. Such a *plan* does not have any real planning value, rather, it will be a retrospective justification of performed actions, organized in the form of a plan.

The Basic Structure seems to support both the preceding plans and the reflective ones. Both actual interventions and *planned* ones are documented using the same Intervention class. The reasoning behind the intervention is then documented in the Intervention Note class. The intervention note can therefore both take the form of a plan description, as well as, a justification of a performed treatment.

The principles of the documentation practice models is an important reason why the nursing practice is not adequately documented. The fact that the SHH model of nursing documentation practice is based on the principle of the plan, as something preceding the practice, might make it hard for the nurses to document their work. When an intervention is already carried out, writing a plan for it contradicts the nurse’s common-sense understanding of a plan. The same problem seems to exist with the practice model that forms the basis for the Basic data Structure.

⁵Knowledge work can be tasks, such as, thinking, planning, and report writing.

In this model, the plan also precedes the interventions. A documentation practice model should support and accommodate both a preceding and a retrospective reasoning for the interventions performed.

7.2 Plans, documentation and practice

It has been showed in this report, how multiple purposes exist for the documentation work conducted by the staff members at SHH. The documentation has to support the work of the clinicians as a tool for planning the practice, as well, as a tool for collecting information about the practice. This section will discuss the triangular relationship between the three parts; the plan, documentation and practice.

The discussion will argue two things. Firstly, actors use planning tools when they have a need for them. Secondly, actors have a need for configuring their planning tools. However, the documentation system at SHH serves additional purposes aside from being a planning tool for the practitioners, and these purposes produce requirements for the documentation practice of the staff members.

Schmidt and Wagner in (Schmidt and Wagner, 2002a,b) study the concept of ordering systems and the role of artifacts in a work place.⁶ Ordering systems are artifacts used for coordinating the work practices. Examples of Ordering systems are: “calendars, clocks, agendas, minutes, files and folders, archives, standard operating procedures, organizational charts, etc.” (Schmidt and Wagner, 2002b, pg. 1)

The staff members at the office make extensive use of ordering systems. Designing large scale buildings is a highly complicated job and to accomplish it, ordering systems are used to coordinate the many tasks involved in the project. Staff members not only use readily available artifacts, such as a CAD design system, but they also develop new ones and modify existing ones to meet their needs. For instance, they develop Excel spread sheets and Word documents for storing details about important stages of the design project. Notes and sketches are added to copies of *official* CAD drawings thereby enabling them to support the ongoing design process.

An important conclusion from the study is that ordering systems, as artifacts for coordinating the work practice, are continuously modified and altered to fit the practice. To put it in another way, the members of the practice, the user of the ordering systems, are constantly adapting the systems to their needs. As a consequence of this, ordering systems do not exist if they are not useful to the members of a practice.

The staff members on M6 also make use of a number of different artifacts which could be termed ordering systems. The Blue Binder, the calendar in the nurses’ office, is an example of an ordering system. As in the case of the architects, the nurses modify it to best support their needs. The calendar can be modified by allowing routine tasks to be added to the pages, so that they are included on the printed pages. The Conference Schedule Plan is an example of a sophisticated coordinative document developed on the ward. The document is used to permanently store dates at where the patients are discussed at conference. The document sent to all of the participants at the conference as the official agenda. But the paper is also used as a tool for helping the participants scheduling patients for future conferences during the conference. The scheduling of conferences and the role of artifacts in the process will be discussed further under section 8.

The patients also use ordering systems. The forms used by the patients during the course of their treatments can be understood as ordering systems. The Weekend Leave form is a document where the patients can describe their planned activities for the upcoming weekend. The form can be thought of as an ordering system in the sense that it is used differently by different patients and in different situations. Depending on the state of the patient, he will stress different things on the form. (The form is used as a tool to enable self-reflection in the cognitive therapy.)

The EPR system also functions as an ordering system. According to both the clinical management and the EPR-Observatory, the electronic patient record is intended to serve as a tool,

⁶The articles are based on studies at an architects office in Vienna, Austria.

which can assist the clinicians in planning their treatment of the patients. Clinicians are free to decide the content of their plans. As shown, the Nursing plans can be altered, replaced or terminated during the course of treatment as a result of their relevance. However, because the system also serves to document the treatment, staff members have to produce documentation, regardless of their needs. Furthermore, external norms are described regarding what this documentation has to contain.

This circumstance, the relation between documentation and planning, might be the main reason why the production of nursing documentation is unsatisfactory in most SHH wards. The nurses might simply not need the plans, and therefore, they do not write them.

According to nursing theory (Björkdahl, 2001) and the clinical nurse, nurses do in fact have a need for planning their work. Nurses are responsible for carrying out a large part of the treatments performed at the hospital. Nurses work intensely with many patients at once. Therefore, the nurses have a great need for *operational planning*. Unlike the psychiatrist's documentation in the Plan of Treatment, which is general and abstract, the Nursing Plans are more concrete, describing the treatments performed.⁷ The Psyk-VIPS manual also stresses the operational orientation in nursing documents. It argues that the Nursing plan has to describe: Who is responsible for performing an intervention, at what times and in what way (Björkdahl, 2001)

My observations and comments from nurses on the ward, however, suggest that the need for coordination and planning is satisfied with other means, the most important of these being *manual face-to-face* coordination. The staff members are able to talk and ask each other questions, if they need to know something. The organization of work, the contact person and the teams, is an important factor for making this possible. The fact that the face-to-face coordination is sufficient for coordinating the work is explicitly recognized in at least one ward at SHH. According to the clinical nurse, the nurses on ward M2 have explicitly stated that they do not need the planning support offered by the EPR system. Because of this, they do not want to live up to the official standard for nursing documentation. The nurses on M2 run a day program. "They [the staff] are all on the ward during the day shift. Therefore, they do not need the Patient records to communicate information over work shifts." (The clinical nurse of the M section)

The patients are also a resource for coordinating the work on the ward. "On this ward [M6], we can ask the patients, if we are not sure of something. I used to work at a closed ward. There, we had to write down every thing, in order to remember it" (a nurse on M6) The nurse has recently transferred to M6 from one of the closed wards. On the other ward, the patients were in a much worse state and did not provide the same aid to the process of coordinating work. Because of this, the nurses had a much greater need for documenting their practice (preserving information) and writing plans for their work.

Berg (1999) stresses that the collection of data in a system always results in an increased work load for the collectors. He argues that the benefits of and burdens from information systems are distributed across the organization. The people who are required to do extra work are not always the ones who get the benefits from that extra work.

"Because IT optimists neglect the additional work required to *produce* data that can be transported across contexts, nurses and physicians have to put efforts in aligning with the detailed forms so that 'third parties' acquire insight in the primary process. (Berg, 1999, pg. 394)

This imbalance can be observed with the Danish Basic data Structure approach to electronic patient records, as well as, the system implemented at SHH. With the Basis data Structure it is stated that the long term goal is to be able to retrieve structured medical data from the descriptions made by the clinicians, and it is admitted that this will require a change in the documen-

⁷The Plan of Treatment has a larger scope and focuses on diagnosis and larger problems, the nursing plans focus on concrete problems, such as, helping the patient to manage activities in his or her daily life (like cleaning, shopping, coping with specific anxieties).

tation practice of the clinicians. In the case of the nursing documentation practice at SHH, the introduction of electronic patient records has meant an increased work burden.

The fact that the collection of data results in extra work for the clinicians should be considered as a general premise for designing a well functioning system. Furthermore, this premise should be communicated to the users. It should be made clear to the users that additional purposes exist for the system, besides from the support of their work, and that these influence the design of the system.

The extra burden of collecting information, combined with the fact that the documentation might not even be useful to the collector, is another possible explanation for the low productivity of nursing documentation.

As stated by (Schmidt and Wagner, 2002b), the actors have a need to configure their ordering systems, in order to adjust it to meet their changing practice needs. The clinicians abilities to modify the official documentation system, however, is limited by the external requirements. They are limited in two ways. Firstly, they are limited to using certain documents for documenting their work, documents that are specified in the official standards for documentation. And secondly, they are limited in what they can, what they have, and what they cannot write in these documents. A potential conflict between the needs of the clinicians and the external requirements exists.

On ward M6, the nurses make use of a number of cognitive forms in their work with the patients. The information in these forms overlaps with the information in the *official* documents. For instance, the nursing plans on a patient will reflect the problems addressed in the treatment and thereby the descriptions in the cognitive forms. In the same way, the Patient Status document and the Patient's Conference form overlap in their content. In the Patient's Conference form, the patient describes himself. The Nursing Status document also contains the patients description of himself (Along with a description of the nurse's view of course.)

An important difference between the two types of documents is that the forms can be used more freely. Most of the forms used in the treatment are constructed by the staff and they can be modified if necessary. The forms can also be used more freely because no external requirements for them exists. They only serve as tools aiding the treatment.

When the two types of documents exist at the same time and when they overlap in their content, they will compete for attention of their users. The official documents run the risk of becoming irrelevant to the clinicians. There are two reasons for this. First, the cognitive forms are *closer* to the actual work, the therapy sessions with the patients. The official plans can easily become secondary to both the work and the forms done while performing it. Second, since the forms can be more freely used, they can easily be favored over the official documents.

According to the EPR evaluation report (Bernstein et al., 2001, pg. 96) from the Danish EPR Observatory medical data will undergo further standardization in the future. It is stated that a "standardization of the sharing of data will lead to a harmonization (harmonisering) of the clinical process." The report, furthermore, refers to a work group, put together under the Danish Ministry of Health in April 2001, assigned to developing standards for documentation of clinical processes. It is hoped that this group will be able to define the basis of documentation standards on content. The conflict between the local and the global might therefore become even more evident in the future, as a result of the standardization efforts.

It has been argued that the practitioners follow two different protocols, when performing their work. The EPR system at SHH only supports one protocol for practice, as does the Basic data Structure (The clinical practice model described in section 5.2). Within the field of CSCW, however, it has been argued that the actors (the clinicians) need to be able to define their own protocols of work. In other words, a system has to allow for the clinicians to define their own practices. This is not possible within the Basic Structure framework. In order to understand why, I will briefly compare the Basic data structure with the structure of CSCW system platforms.

Some attention has been devoted to developing platforms for supporting cooperative work within the field of CSCW (Schmidt and Simone, 1996; Divitini et al., 1996; Jonathan et al.,

1995). The the goals for these projects where to build platforms, able to support the articulation work of the users. The platforms proposed are generic frameworks, on which domain specific systems can be build. The systems are generic in two ways. Firstly, the can be build to fit a given work domain (for instance, the medical practice). Second, they also allow for configuration and modification by the users of the systems.

It is stressed in the articles that two principles are essential, when supporting cooperative work. The first one is *malleability*, the ability of the users to adapt the system to fit the changing requirements of the practice. Secondly, the system should provide *linkability*, the ability to allow the user to freely configure the system of coordination mechanisms to fit the work practice.

The platforms contain the primitives for building domain specific systems Some of these primitives are: ⁸ *Activities or tasks* are the things that are done. Activities can both be those carried out, as well as, the plans describing a number of physical activities. *Roles* can be described as the functions or jobs defined within a field of work. Actors can take on roles. *Actors* are the objects that perform the activities. Actors can be the people in a work group, but it can also be a group of people or a machine (performing an automated activity). By configuring these primitives and linking them together, the users can model their field of work.

The overall difference between the two approaches, the CSCW platform and the Basic Structure, is that the CSCW platform can be freely configured by the practitioners (for instance, the staff on ward M6.) The EPR system on the other hand, whether it is the system at SHH or the Basic Structure, is pre-configured and standards are described for its use. Some freedom, for the practitioner to decide what they want to write does exist. The nurse has the ability to decide how many plans she wants to define and the content of the plans. The documentation standards are also revised regularly by the clinical management, on the basis of feedback from the clinicians. Thus, the system allows for some degree of malleability. The Basic Structure also gives the user some freedom in linking elements. The Basic structure allows, at least in principle, for the nurse to refer to description made by others. (Nursing interventions can be related to the psychiatrist's interventions)

However, there is one major difference between the two. The Basic Structure does not define the actor as an independent object. (There is no Actor class.) Instead, information about the actor is included into the other classes. For instance, attached to any documented intervention is an Intervention Note. This note contains information about the actor, who performed it. Because the information about the actors is integrated into the other objects, the clinical procedure can not be modified in the same way as with the CSCW platforms. The Basic Structure might therefore prove to have a limited use as a basis for a planning system.

In this paper, it has been argued that contemporary EPR systems require the user to follow a specific practice. My observations have shown that the nurses work in two different ways, and that this might impair the usability of the EPR system. Further comparisons of EPR systems and CSCW platform technology can help to clarify the potential role of the Basic Structure as a planning tool, or as Schmidt and Wagner label it an ordering system.

⁸Primitives are presented in an altered and simpler form, than in (Jonathan et al., 1995; Schmidt and Simone, 1996). The descriptions here only serve as a general introduction to the concepts

Chapter 8

Articulating practice

This part of the report discusses the activities surrounding the articulation of work. As noted in section 3, the medical practice is managed through a combination of Standard Operating Procedures and Articulations Work. Articulation work is the debating and negotiating that serves to coordinate the work activities on the ward.

Activities on M6, are to a large extent coordinated manually and *face-to-face* by the nurses on M6, other staff members, and the patients. The special organization of work and resources, the contact person system and other organizational systems serve to enable this. Much of the work is coordinated in an *ad hoc* manner, when circumstances demand it. However, formal coordination activities also exist. Two of these are the staff meetings (the nurse's daily meetings) and the conference. The discussion in this section will primarily focus on these two formal articulation activities.

In this section, the two activities will be presented, the staff meeting followed by the conference. The descriptions will focus on the activities and the artifacts used at the meeting sessions. The support of the articulation activities, offered by the artifacts, will be discussed in the following section. This then leads to a general discussion of how to integrate documentation in the electronic and the paper based media.

Reports take place in the end of each shift. The purpose of the report is, as noted earlier, to pass on knowledge between the nurses across shifts. A nurse will meet in before the previous shift ends and receive the *report of incidents* from a nurse on the prior that shift. The *new* nurse will then pass the information onto the other nurses on the same shift. The report is passed on to the other nurses at the morning meeting.

The agenda of the meeting contains a few regular points. First and foremost, the reporting nurse passes on important information to the other attendants. Secondly, the activities of the day are coordinated. The nurses will go through the items in the calendar and distribute the tasks among them and they will inform each other of the activities they are involved in. If a new patient is scheduled to arrive in the near future, the nurses will use the morning meeting to assign a contact person to the patient, and they will assign someone to be responsible for introducing the patient to the ward and perform the introduction interview.¹ As part of the coordinative work, standard tasks are assigned to each of the nurses. Standard tasks, such as, ordering linens from the hospital laundry department. An *office duty* is also assigned to one of the nurses, placing her in the office throughout the shift where she is responsible for answering the phone, distribution of medicine, and other more administrative tasks.

The morning meeting is also a forum for a more unstructured debate and exchange of opinions and knowledge. The issues, brought up by the *reportee* will often be debated by the attendants. The nurses will share knowledge and discuss concrete situations and problems they have

¹The assigned contact person might not be at work on the day of arrival

with their patients. For example, at one morning meeting an intern ² was asked to share her experiences on the ward. These were then debated by the staff. At another morning meeting, the practice of writing nursing epicrisis documents and the ward's connections to other public institutions were debated. This discussion was inspired by a visit to an exterior psychiatric institution earlier in the week. Thus, the morning meeting provides a learning forum, where experiences can be shared.

The nurse usually uses handwritten notes to structure her report. The notes are brief and usually only consist of simple statements, such as, "patient N.N. out last evening" or "call physician regarding patient N.N.'s foot." According to a nurse, the pad of paper can be handed over from one report-responsible nurse to the next over several shifts. The following report-givers will add to it and modify the notes on the paper. The nurse, writing the first sheet of notes will usually read through the notes in EPR and add the most important ones to her note paper. New report notes, with summaries from EPR, are often created in the evening or night shift. It is done in this way because the nurse has more time available in this shift.

The other nurses at the morning meeting will usually write down their own notes on a piece of paper. Most nurses use notepads to help remind them of important things and tasks throughout the shift.

As mentioned in section 2.2 The conference is an activity, which coordinates the *arc of work*; the complete work task of treating the patients. At the conference, the overall guidelines of work are articulated. The Conference results in a Plan of Treatment, a document written on all patients by the responsible psychiatrist.

Observations from a conference will be presented to provide an understanding of *what goes on at a conference*. The following example, thus, describes the course of a conference. The descriptions are based on my notes taken during a conference. Because of this, and the fact that a very detailed description would be more likely to confuse than to clarify, the descriptions do not cover all of the details from the conference. But it does provide a good overview of some the processes and actions of the staff members present at the conference.

A psychiatrist, a social worker, and four nurses were present at the described conference. Four patients were discussed during the conference, which ran over two hours. Conferences always run over two hours. Thus, if the discussion of patients takes more time than expected, planned patients will be scheduled for a later conference. The described conference differs from a *normal* conference in that not all the usual staff members were present. ^{3 4}

Prior to the conference:

The psychiatrist and the social worker arrive at the office about fifteen minutes prior to the conference. They both use the time to read up on the documents about the patients.

The psychiatrist is looking for the effects of an adjustment in a patient's medication (The patient is not discussed at today's conference.) She first looks in the Nursing Notes, and the Nursing Status document on the patient. She then looks in the social worker's notes and her own notes in the Medicine Module. (The physician can make notes on the different drugs given to the patient.)

Patient 1:

²a student

³Normally both psychiatrists would be present at the conference. The physical trainer had also been present at most of the observed conferences. The debate at the conference might, furthermore, have been influenced by the fact that the work in the cognitive groups were suspended, due to shortages in staff (summer vacation period).

⁴During my stay on the ward, there were repeated talks of whether the patients should be present at the conferences. This change would have a great impact on the whole arrangement of the conference. At all my observations, however, the patients' participation was limited to filling out the Patient's Conference form prior to the conference.

The Contact Person talks about the patient and the state of the treatment. The psychiatrist asks her questions. The other nurses assist with knowledge and opinions about the patient and treatment. The Patient's Conference form is also read aloud by the contact person.

The psychiatrist has the Plan of Treatment document open on the laptop. She looks in the previous plan from time to time. The plan of Treatment also functions as a checklist for the discussion of the patient. The different initiatives described in the plan are systematically discussed and evaluated.

The patient has been on M6 for over three months, which means that the treatment and therapy is in a "relatively stable phase". The psychiatrist writes down some details about initiatives on a piece of paper. She will use these, when she dictates the new plan of treatment.

Finally a new date for the next conference is agreed on.

Patient 2:

The course of this patient's treatment is more problematic. This calls for a more intense use of the information available on the patient.

The central question according to the psychiatrist is, "The patient's motivation is not there, shall we discharge him."

The *traditional* presentation of the patient is replaced with a more focused discussion of whether the patient benefits from the treatment or not. The Patient's Conference form is not consulted nor is the Nursing Status document, instead the people present draw upon their experiences and opinions.

It is argued, that the patient "breaks his agreements made with the staff" and this is discussed among the people present. The psychiatrist consults her Treatment Notes in the EPR system. In the note, she finds proof of an occasion, where the patient has broken an agreement, which he made with her. "The patient was to describe (formulere) his motivations for staying at the ward. He was also supposed to consult his Contact person." But these things never happened.

The conclusion of the discussion is that the the Contact Person is to talk to the patient about his motivations for staying at the ward. The psychiatrist writes down notes about the conclusion.

Patient 3

The nurse presents the patient and reads from the Patient's Conference form. The psychiatrist is browsing through the previous Plan of Treatment on the patient, while the nurse is talking. She also opens up the Treatment Notes, and reads one of the entries.

During a discussion of the patient's general health, the psychiatrist wants to know if the patient is a smoker. The nurse believes that she has documented this information in the EPR. However, it can not be found under the Nurse's Admittance Interview document, which is where the information is supposed to be.

The patient is diabetic, so the staff need to be aware of the patient's physical state of health. The psychiatrist is reminded of this (the diabetes), when she is reading in the Plan of Treatment. The psychiatrist also looks at the weight and Body Mass Index (BMI) of the patient. The last recorded weight and BMI figures are over two months old.

As a result of the missing BMI recordings, the attendees discuss the hospitals procedures on treatment of diabetic patients. According to the physician, "Patients with diabetes are to be weighed biweekly or more frequently." It is, therefore, stressed that the patient has to be weighed more frequently in future treatment.

The psychiatrist looks at the blood tests taken on the patient during her stay at the hospital. All of the patient's readings are normal. (Patients on M6 have blood samples analyzed on a regular basis during their stay on the ward.)

The psychiatrist writes down the primary details about the patient, for instance, the main behavioral problems and that the patient is working/cooperating with the staff on the interventions agreed upon.

A date for the next conference has to be set. A nurse looks in the conference plan and the nurses' shift plans. It is stressed among the participants that the contact person of the patient should present at the next meeting. Thus, a date has to be found, where the Contact person is scheduled to be on the day shift.

Patient 4:

This patient is being treated by the other psychiatrist, who is on vacation. The psychiatrist seems to think that there was a special reason why the patient was scheduled for this conference. She looks through the plan of treatment, in order to try to find the reason.

The other people present are discussing the patient. (The psychiatrist is reading during the debate). The subject of the discussion is that the patient is about to be discharged from the ward. A complicating factor is that the patient does not have a place to live when he is discharged. The patient visited an institution with *protected homes* and has expressed a wish to get a room there. The staff, on the other hand, think that there might be more suitable solutions for the patient. The Social Worker is a central actor during the debate. They agree that he is to negotiate other options with the *housing visitation people*⁵ and then present these other options to the patient.

The patient also has to start up job activities when he leaves the ward. The attendants agree that the social worker is to help the patient to a good start with these activities. (He is to escort the patient on a planned visit to the shop, where the patient has to work.)

The psychiatrist writes notes about the two planned tasks.

After the conference:

The psychiatrist brings the Paper based journal along with her back to the office. She wants to keep them for the next couple of days, while dictating the plans.

The example shows how the EPR system is used to find missing information, when it is needed in the discussion of the patients. And at the same time, the EPR documents help the attendants to structure the meeting. The sections of the Plan of Treatment are discussed systematically. The example with the diabetic patient, shows how the documentation, or rather the lack of documentation, can help to address weaknesses in the treatment.

The example also illustrates the protocol of the conference. The discussion of a patient usually starts with the Contact Person introducing and describing the patient. Proceeding this introduction is the actual discussion of the patient and the treatment. The discussion is always rounded off by setting a date for the next conference and the psychiatrist taking notes in order to be able to write the Plan of Treatment.

But the example also shows that exceptions can be made to this *fixed* protocol. In cases, where the psychiatrist has an indepth knowledge about the patient, or as in the exemplified case where time was short, the introduction of the patient might be minimized to make more time for the discussion.

Different roles are assigned to the attendants at the conference. One of the nurses are usually assigned the role of *time manager*. The time manager keeps track of time to help ensure that the

⁵The people at the public office responsible for offering people in need a place to stay.

schedule is met. (In many cases some of the scheduled patients have to be put on new conferences.) The Plan of Conferences is usually also handled by this nurse throughout a conference, putting her in a central position when patients have to be scheduled at future conferences.

The contact person is usually the one describing the patient, the treatment, and the development in both. The Psychiatrist usually assumes the role of asking questions and reflecting on the descriptions. The psychiatrist focuses on the bigger questions regarding the treatment, such as, estimating the duration of the patient's treatment or defining the category of the patient (the diagnose and type of disease).

Staff members are also assigned different clinical roles, for obvious reasons. The psychiatrists are formally responsible for the treatment. They are, therefore, also responsible for writing the plan of treatment, the only document required by law. The nurses (or any other professional group) have no say in the content of the document, and they do not sign or approve it in any formal sense.

The psychiatrist might have different opinions than the nurses regarding the main problems of a patient. Reasons for this are that the nurses spend more time with the patients than the psychiatrists do and that the two professional groups have a different relationship with the patient. The psychiatrist has the authority to change the medication of the patient, just as she decides the duration of the treatment. This can make the patients act differently around the psychiatrist (than they would around the nurses), in order to achieve certain goals. The indifferences might surface during the conference or they may become evident in the plan of treatment. In both cases, the psychiatrist has the authority to decide the approach. Nurses can only put their counter arguments forward and thereby affect the psychiatrist's decision.

8.1 Supporting articulation work

The case descriptions illustrate the use of artifact at the meeting activities on ward M6. They show how the EPR system is used as a reading tool during the conference meeting and how the system is not used at the ward meetings at all. At the meetings, hand written notes are used, both as a means of structuring the meeting and for storing important information brought up at the meeting.

The discussion in this section will focus on the use of the two technologies, the paper notes and the EPR system, during the meetings as reading and writing artifacts. More precisely, this section will discuss the abilities of the two artifact types to support the articulation work that takes place during the meetings.

In order for the EPR system to be a well functioning system, which is integrated into the work practice of the clinicians, the system has to be used by the staff members. This does not seem to be the case with the nursing documents. As previously argued, the nurses do not produce the expected amount of documentation. This, combined with the fact that the electronic documents are not used in any nursing meeting activities, suggests that the EPR systems is not ideally integrated into their practice.

One of the nurses explains the low production of documentation by the fact that the documents are not read by others. She argued that "we are writing the documents for our own sake... No one reads them." According to her, the documentation productivity could be improved by integrating the electronic documents into the meeting practice.

Another nurse argued that by reading the electronic documentation at the meetings, the nurses would gain a deeper knowledge⁶ of the state of the patient and the state of the treatment.⁷ The nurse believed that a problem associated with the procedure of writing notes on a pad of paper and using these to guide the report, is that the report will tend to focus on the daily

⁶Translated from the Danish expression "bedre overblik", which directly translated means better overview.

⁷The nurse previously worked on a "closed" ward. On this ward, the EPR system was used at the report meetings.

events. The notes will tend not to focus on changes to nursing plans and other more *long term* and theoretical issues. When paper based notes are used to structure the meetings, it will not be directly visible to the attendants, when a Nursing Plan ought to be revised or replaced.

The electronic nursing documents should be an integrated part of the *discourse* in the ward, the ongoing clinical discussions of the treatments and therapies performed. If the system serves a role of supporting the debates, it will also makes sense for the nurses to spend time producing the documentation in it. In the words of a nurse, “we have to move away from double documenting”, the situation where the clinician writes notes on a pad of paper at the meeting and afterwards enters them into the EPR system.

However, the EPR system should not be used at the meetings at any costs. First and foremost, it has to be useful for clinicians attending the meetings. In other words, they have to be able to use the system at the meetings. The analytical term *affordance*, proposed by Sellen and Harper (2001), addresses this question. They argue that technologies supports different activities to a varying degree. In other words, a technology affords certain activities.

“An affordance refers to the fact that the physical properties of an object make possible different functions for the person perceiving or using that object. In other words, the properties of objects determine the possibilities for action.” (Sellen and Harper, 2001, pg. 17)

In particular, they argue that paper based technologies, such as the note pad, afford different activities than electronic documentation systems.

“To understand why this is so, we need a better grasp of the reasons that paper supports some kinds of human activities better than the digital alternatives do. We need to understand what it is about the physical properties of paper that make it play into different aspects of the work that people do, and how work practices have evolved along with paper in such a way that paper is woven into the very fabric of work.” (Sellen and Harper, 2001, pg. 16–17)

Therefore, no solution should be based on a single technology alone. Systems should be designed to support integration of and inter-operability between the paper based and the electronic information and documents. Both the affordances of paper and of the electronic systems should be considered in the design of a total solution “with this knowledge in hand [the affordances of the technologies], designers can create *combinations* of the best of both the paper and the digital worlds.” (Sellen and Harper, 2001, pg. 143).

A main affordance of the EPR system is that it enables the clinicians to share their documents. Different clinicians, physically placed in different locations, can read the same documents. A main affordance of the paper based documents are their flexibility. As previously mentioned, the paper based forms can be used more freely than in the case with the official EPR documents. Another flexibility of papers is that they can be used more freely in the writing process (Sellen and Harper, 2001). For instance, the user is free to physically arrange his scribbles on the paper and he is able to make comments in the margin of the paper. This is usually very difficult to do in electronic writing systems.

During the conferences, the laptop is controlled by the psychiatrists. When both psychiatrists were present, they would take turns operating it, depending on the patients that were discussed. (The psychiatrist, who’s patient was discussed, would usually operate the laptop). The laptop was only used to read information from, no information was typed into the EPR system during the observed conferences. In situations where texts in the EPR were read out loud for the other participants, the other staff members would occasionally take a look at the screen, and read for themselves. (This happened a few time during the observed conference. *Collective* reading should therefore be considered as exceptions to the rule. The EPR is primarily used as a reading tool by the psychiatrist, who’s patient is discussed.)

The Plan of Treatment document⁸ serves to control the structure of the conference. The document functions as a *script*, guiding the attendants through each section of the documents.⁹ The attendants will usually start by discussing the general state of the patient. During this discussion, the psychiatrist will consult the *Short resume of patient* section, the first section, and she will compare the statements from the other attendants with the descriptions here. The same principles are repeated through the sections of the plan; the descriptions are compared to the present impressions of the attendants (during this, the psychiatrist will write down short notes on a pad of paper of the things *agreed on*).

Occasionally, the psychiatrist will open up other documents in the system in order to search for some *missing* information.¹⁰ During my observations, the Nursing Notes seemed to be favored by the psychiatrist when searching for missing details. When searching for information, the psychiatrists would usually browse through the Nursing note and then the notes written by themselves or others.

The ability of supporting reading and information searching (browsing through documents) is argued by Sellen and Harper (2001, pg. 101–103) to be one of the weak-points of electronic systems. They argue that when it comes to reading, the paper media has affordances far superior to modern computer interfaces. They argue, for instance, that the paper medium enables a spatial flexibility. This means that papers can be placed next to each other on a table, thereby giving the reader a better overview over the material. Likewise, paper is *tangible*, meaning that the reader is able to feel how long a text is by the thickness of the papers. The EPR system does not provide this support to the reader and it is only able to display one document at a time.

Nevertheless, it actually seems to work reasonably well for the psychiatrists during the observed conferences. In order to really decide whether the EPR system is actually a usable information searching system in a meeting setting, my studies should be compared to studies of *paper based* conferences.

During my observations there have been situations where descriptions from the EPR system as well as, from paper based documents have been read aloud at the conferences. In the case of the possibly brain damaged patient, the result from tests performed by a Neurologist were brought out and discussed at the conference. The paper stated that there were no identifiable neurological problems with the patient. This served as a deciding factor in the planning of interventions.

In another example notes from a psychologist, not present at the conference, were read aloud:

During the discussion the psychiatrist suggests, that a note entry written by a psychologist (engaged in therapy sessions with the patient) should be read aloud. She reads out the notes, which are a description of the psychologist's perception of the patient's problems. According to the note, the fundamental reason for the symptoms showed in the patient is "low self-esteem". The psychiatrist finds, that the note clarifies and *sums up* the discussions they are having about the patient. (conference meeting on M6)

The example shows how the work of other parties can play a role in the discussion at the conference. Preceding the observations described here, the attendants at the meeting had been sharing opinions on the reasons for the patient's problems. Different explanations of the patient's problems had been laid out by the attendants of the conference. The descriptions by the Psychologists served to clarify the conclusions of the discussions, and thus helped to establish a unity among the different opinions of the staff members attending the conference. This functionality is also possible when using the paper journals. However, it would demand that the documents,

⁸The *previous* plan, the document written following the previous conference.

⁹Schmidt (1997) introduces the term *Script* to describe the ability of a written description to guide the reader through a certain set of tasks. He uses the example of the *aircraft flight-deck checklist* that guides the pilot through the preparations before takeoff. The checklist guides him through the task, but at the same time it also allows him to abandon the procedure, when he needs to do so.

¹⁰as in the case of patient 2 in the case description

such as the psychologists notes, are actually available to the attendants at the conference. The EPR system has undoubtedly given the documents a greater visibility.

The question remaining is whether the EPR system is usable for the nurses during their meetings? It probably is. The structuring effect of the plan documents on the meetings would be a different one, because of the fact that several Nursing Plans exist on each patient. Secondly, the nurses' meetings are not structured in the same way as the conferences. (Depending on changes in the state of their illness, all patients are potential subjects at the meetings.) However, one precaution deserves to be mentioned here. Some of the nurses on the ward were not very comfortable operating the system (opening document windows and so on). The users have to be able to handle the system well, in order to be able to use it in a meeting setting to display patient data. Otherwise, using the system will disrupt the flow of the meeting.

Before the implementation of the EPR system, the psychiatrists would use a *Dictaphone* to record the content of the plan with. They would record their statements on tape. The actual plan would then be written by secretaries. The same procedure applies for the new electronic system. The Psychiatrists will take notes on a piece of paper. They will then use their notes, when they dictate the new Plan of Treatment afterwards back at their office. The only difference is that the secretary will type the plan into the system instead of the paper based report.

For a period, the staff experimented with writing the plan at the conference. (This occurred before my observations at the ward. My descriptions are therefore based on descriptions referred to me by the staff members.) Instead of using a secretary, the psychiatrist would write the plan after the discussions of each patient. This procedure allowed the other attendants to participate in the actual writing process, when this was beneficial. It also allowed the other attendants to acknowledge the wording of the descriptions in the plans. Two main conclusions from the experiments were reported by the staff. Firstly, it was clear to all that it took too much time to do the actual writing at the conferences. As a consequence of the changed procedure, they were not able to discuss the same amount of patients during the two hour conferences. In fact, this was the main reason for canceling the new writing procedure. Secondly, a positive conclusion from the trials was that the *plans* always contained the information agreed on at the conference meeting. According to the nurses, the Treatment plans, which appear in the system after the conference, can sometimes differ from their perceptions of *what was agreed on at the conference*. (Reasons for this can be: forgetfulness or disagreements between the attendants at the conferences.) By writing the plans at the conference possible disagreements would be sorted out immediately.

Another approach in integrating the EPR system as a writing tool during the conferences could be to make the Psychiatrists write their draft notes in the system. Instead of writing the complete descriptions in the Plan of Treatment, they could write some more or less detailed notes at the conference. Such an approach would not occupy the same amount of time at the conference, as writing the full descriptions does. Providing that the psychiatrists are the ones physically writing the final descriptions (and not the secretaries), this approach would still eliminate the mistakes and misunderstandings directly at the conference.

The draft approach is just an idea and might not be functionable for the attendants at the conference. Sellen and Harper (2001, pg. 61–67) concludes from studies of meeting activities at the International Monetary Fund (IMF) that computers are not very useful as note-taking devices. The process of handling the documents in computers is too cumbersome and disruptive to the flow of the meeting (Operating the equipment takes away the attention from the real subject, the discussion). Whether or not the draft-writing approach is usable for the staff as SHH, thus, will have to be proved by actual experiments.

It is not necessary to discuss whether the nurses should be writing in the electronic system during their daily meetings, because electronic documents are typically, produced by the nurses individually. It would probably still be fruitful for the report-giver to write down notes for structuring her report prior to the session, just as the other nurses should still be writing their notes on pieces of paper. In other words, the EPR system would probably only be able to serve a purpose as a reading tool, allowing the attendants at the meetings to hear the precise wording of the descriptions.

8.2 Integrating documentation media

The overall goal of the EPR project on a national level, as well as, at the hospital studied in this report, is to replace *old* paper based documentation systems with new electronic ones. This process is termed *Digitalization*. It is not known whether the goal of the current digitalization projects is to replace all paper based documentation or whether the two media are allowed to co-exist in future work places. The observations conducted during this project have identified many paper based documents, which play a crucial role in the treatment of the patients. The most prominent example of such paper documents are the forms, which patient and contact person work on as part of the cognitive treatment. These documents are kept by the Patient. The existence of two separate media for the documents calls for a discussion of the integration of data between the two media.

The relation between and the integration of documents is relevant to discuss. Sellen and Harper (2001) argue in their book that instead of trying to replace papers with electronic systems, designers should focus on designing solutions which are able to integrate the two media. Well designed systems should enable the user to shift in between the two media during the course of his work, and to transfer documents from one media to another in order to best support the needs of the users.

The case of the Weekend Leave form¹¹ illustrates a situation where procedures for including the information from the form into the EPR system were created (ie. Typing the information into the system). Two other ways of integrating documents should also be mentioned here.

Paper based documents can be scanned into the EPR system (This is not supported in the observed system.). Scanning paper documents directly into the EPR system is an efficient solution. By scanning the documents into the system, their visibility is extended, enabling all staff members to access them. The Patient's Status form is an example of a document, which is occasionally shared between the staff members involved in the treatment. Occasionally, the contact person or psychiatrist wants to store the form for future references. At present time, this is done by placing a physical copy of the form in the patient's paper based record. The head nurse on M6 expresses this need in following statements: "We ought to be able to include the forms by scanning them into EPR or to include them as Word documents... It is too much work to type the Patient's Conference Forms into the EPR system... As it is right now, we can refer to a form (placed in the *enclosed* section in the paper based journal) manually, but this does not work very well.". A documents presence in the paper record's folder is not explicitly documented in the EPR system, besides a textual reference in a section of a document. This lowers their visibility in the total documentation system. (Paper documents are not easily noticed when staff members read through the documents on a patient.) The current procedure is also error-prone. When papers are removed, either because they are lost or in the process of tidying up the folder, the textual reference in the electronic documents to that particular document is not removed. A system, with a document scanning support would solve some of these problems. It would enable the staff members to effortlessly include *enclosed documents* and it would also be able to provide means for indexing the enclosed documents. (Such an indexing feature could obviously also be implemented without the scanning support. But the system would not be able to ensure the integrity of the index.)

The other way of integrating the two media is by changing the practice for the writing of documents. Instead of writing on paper based documents, electronic documents with a similar structure could be created. This solution is not possible for all documents. Most paper based documents are paper based for a reason. For instance, the patient does not have access to a computer during his stay on the ward. Secondly, the computer as a tool for reading and writing might not be functionable for the patient. (The patient's work with the forms is a therapeutic work process. The computer might impair the patient's therapeutics work.)

The Patient's Conference Form is partially included in the Nursing Status document. More precisely, the Nursing Status document contains a section with the patient's account for his sit-

¹¹See section 4.2

uation. This section could possibly be expanded to contain the information of the Patient's conference Form, which would make the form obsolete. The Nurse and the patient would be able to prepare the common document together.¹² The benefit of a shared document would be that the time spent on writing documents could be cut down.

The change in the procedure for writing the electronic documents is not a completely hypothetical one (made up by the author of this report). The clinical nurse of the M section argued at several occasions that the contact persons should bring the laptop computer to certain sessions with the patient. The nurse's admittance interview document is an example of a document which, according to the clinical nurse, could be written during the actual interview. The Nurse's Admittance Interview is a structured interview, where the nurse collects certain important information about family and dependant relatives. The clinical nurse also mentioned the Nursing Status as a document, which could be produced by the patient and the contact person together at a meeting prior to a conference. The electronic document would then serve as a *checklist* of the subjects talked about at the meeting, and at the same time it would be filled out directly. During my observations, the nurses would usually take notes on a piece of paper while talking to patient. They would use these, when filling out the electronic documents.

Another benefit with a changed procedure, according to the clinical nurse, is that it would ensure that the documents would in fact be written. This is particularly import with the admittance documents that have to be completed within a certain time margin. In several cases, she had observed that the interview had been conducted, but that the writing of the document had been delayed or forgotten. This would not occur if documents were written at the meeting.

However, changing the procedure and including previously paper based documents into the EPR system should be done with caution.

Sellen and Harper (2001, pg. 121–122) studied the implementation of an electronic record system at a British police corps, and found the shift to be a problematic one.¹³ The system included laptop computers, which were intended to be used during interviews of the victims of crimes. However, the officers did not find the laptops to be usable in interview sessions. “.. the psychological state of crime victims was often such that police officers had to be extremely alert and sensitive to the ebbs and flows of what those victims said; pauses were sometimes the manifestation of stress as much as a simple mechanical feature of telling the story.” The officers felt that having to operate the computer during the interview sessions limited their ability to listen to the story of the interviewee.

Furthermore, the rigidity of the computerized forms made it hard for the officers to type in the needed information during the interview sessions. “Nor did the victims tell their stories in the order in which the police officers needed to enter them; indeed, though police officers tried to steer the narratives, it was often the narratives that determined the order of data entry activities.” (Sellen and Harper, 2001, pg.120)

The situation of a police interview is similar to that of a nurse or psychiatrist in an interview or therapy session. As in the police case, it is also crucial that the health professional is sensitive to the expressions of the patient. A digitalization of documents produced in a patient–staff context should be accompanied with empirical evaluations.

According to Sellen and Harper (2001, pg. 164–166), not all documents are suitable for sharing. There can be two reasons for this. Firstly, some information might be more useful for a single person in its original paper format. In a discussed case, papers were scanned into a digital document management system, making them available to the other staff members. But staff members preferred to keep some of their documents in close reach in the original paper form, because they were more useful to them this way. Secondly, some documents might not be

¹²Maybe they would have produced each their draft document prior to the meeting. In any case, a new procedure for creating a common document would have to be established.

¹³The main rationale behind the new record system was that it would enable an effective sharing of data between the police officers. Information entered into one terminal would be accessible to all other officers at their terminals and through mobile devices in their cars.

suitable for sharing because of the nature of their content. In the referred case, some documents contained private notes, which were not intended for others to see.

This is relevant, when designing a procedure for documentation work at SHH and at a more local level on ward M6. Documents can sometimes be more useful in the paper form. This is the case with many of the patient's forms for instance. But the nature of the content is also relevant, when determining the media for storing the information in. The patient's folder is indeed the patient's. According to the nurses on M6, the patient's forms are perceived as the property of the patients. Therefore, the Patient's Status form is returned to the patient after the conference. When copies of it and any other forms are made, the patient will be asked for his permission. The forms contain his personal writings and it is therefore important to respect his ownership. For this reason, it would not be possible to systematically store the patient's documents in a (hypothetical and scan-in supported) EPR system. A similar, but opposite problem, has to do with protecting the discretion of the staff's writings. Even though the writings of the staff members are formally and legally accessible to the patient, they are kept out of his immediate reach. The documents in the patient's record will in many cases contain information that might have a negative effect on a patient during the many difficult periods of his treatment. For instance, a patient struggling with coming to terms with the extend of his problems might give up, if he is confronted with the staff's descriptions of him.

This sections has shown how the EPR system is part of a large system of documentation. Some documents are related and connected, while others exist separate from the others. Therefore, when designing a documentation system all of the different documents have to be taken into account. Electronic documents function together with paper based ones. A redesign of one will therefore also affect the other. When implementing changes in the documentation practice, the total documentation system has to be modified all together. For instance, most of the paper based documents described in this report have been invented locally on ward M6.¹⁴ The existence of these paper based documents should be taken into account by the EPR control group. The electronic documents have to be designed to function in a relationship with other locally produced documents.

¹⁴In the case of the Weekend Leave Form, the document was created as a result of sudden requirements from the clinical management.

Chapter 9

Conclusions

Three important aspects have been identified in the process of discussing the Electronic Patient Records technology and these have shaped the structure of this report

The analysis of the documentation practice on the ward revealed a complex system of documents. Many different documents are used during a standard course of treatment and the documents exist both in electronic and paper based media. It is important to discuss the linking of information within the documentation system. This is done under chapter 6.

Documentation artifacts play a role in the planning of work. A detailed discussion of EPR systems' abilities to support the planning (coordination) of the practice is therefore important. A potential conflict between the local and the global exists. The requirements to an EPR system from the surrounding actors (Management and authorities) are not always compatible with the requirements to the system from the practitioners themselves. The role of EPR systems as planning and documentation tools has been discussed under chapter 7.

Finally, the abilities of the artifact to support the ongoing articulation processes, seems to be a key to its success. The EPR system has to be integrated into the discourse on the ward. The EPR system coexists with other paper based artifacts, an integration between the two media, thus, is important to discuss. Chapter 8 provides such a discussion.

The report identifies several purposes for medical documentations and the EPR technology. Medical documentation supports the work of the local clinicians. It enables them to store and share information about their patients, thus, helping them to coordinate their efforts. In particular, the modern approaches described in this paper, emphasize the role of the EPR system as a planning tool.

Externally, the patient record serves a legal purpose by documenting the interventions performed. Furthermore, it is hoped that modern EPR systems in time will provide support for managing the resources of the organization, as well as, supporting the medical research activities.

The implementation electronic patient documentation systems have several consequences for the clinicians and the organization of their work. First of all, it has brought changes to what people write and the way they write it. The nurses at SHH have experienced a great increase in the amount of documentation that they have to produce. The implementation of EPR technology has been accompanied by standardization efforts. EPR system require that descriptions are entered in a specified form. For instance, in order to make evaluation possible, the systems require that goals are expressed in a measurable form. The EPR technologies discussed in this report also standardizes the work practice, the way that the clinicians work. Such a standardization is necessary in order to be able to collect standardized data.

There are also Positive consequences associated with the implementation of EPR technologies. First and foremost, the digitalization of documents has resulted in a greater visibility of the

documents. The clinicians are able to share each others documents across time and geographical locality. Secondly, the electronic medium is able to perform active operations on the data and this can benefit the users of the system. For instance, the EPR system at SHH presents the documents according the actuality of the documents (most recent changes). With the incorporation of information on time, the Basic Structure framework is able to perform automatic evaluation functions and potentially, the system will also be able time to provide some time–planning support for the clinicians using the system.

Finally, my studies have revealed some design requirements to the documentation system and its integration into the organization.

Firstly, an EPR system could support the work of the user by integrating time–planning and reminder functionalities. Such needs were expressed by the staff on ward M6. However, careful considerations need to go into the design of such a planning functionality. A planning system needs to be integrated with all of the other coordination artifacts, such as the calendar on M6. It also has to be established, how the patient–oriented EPR system can be designed to fit the coordinative needs of the group as a whole. (For instance, how can a combined records and planning system be used at the morning meeting for assigning tasks to the nurses.)

Medical documentation is produced according to the principle of defeasibility, meaning that description are spread out over time and place in the system. An EPR system should therefore allow for the user to navigate through the descriptions in it. A linking technology could be in the form of hyperlinks, supporting an easy navigation through the system.

A documentation system should allow some flexibility in work practice. The EPR systems studied in this paper both require that the clinicians follow a pre–specified work practice. However, the observations of the nurses on M6 revealed the existence of two different work practices. The design of a documentation system should allow the clinicians to document interventions after they are performed, as well as, to describe formal plans prior to carrying them out.

Planning tools are used when they are needed and they are used differently depending on the needs of the user. The findings of this report suggest that one possible explanation for the low documentation productivity of the nurses at SHH, is that they have no need for the planning support offered by the EPR system. The EPR system serves both as a planning tool and as a documentation tool. Both of these purposes should be acknowledged in the design of the documentation practice standards (such as the documentation manuals) and they should be clearly stated to the users (ie. the nurses and others).

Finally, the EPR system will be part of a larger system that could be called the total documentation system. The design of the EPR system should acknowledge this fact. The total documentation system is based both on the electronic and paper media. Therefore, the design of an EPR system should allow for an integration between the two media. An integration can be accomplished by different means, for instance, by scanning in paper based information and by changing the documentation practices of the users. Secondly, the total documentation system consists both of official documents and locally defined ones. The design of an EPR system, which can be considered as the official system, should also acknowledge the existence of locally defined documentation systems and it should allow for an integration of information between the two.

Chapter 10

Final notes

This report presents a very broad discussion of medical documentation and the EPR technology. However, during my work with the project, I have come across some relevant aspects which are not included in this paper. The reason for this is simple. The report can not include all aspects of medical documentation. In particular, two things seem important to discuss, cognitive theories of human activity and the varieties of medical documentation.

According to nurses and psychiatrists at SHH, the cognitive approach to psychiatric treatment is very successful compared to rival approaches¹. The cognitive approach is widely applied at SHH and many other places worldwide. Within the field of CSCW, cognitive theories have often been the subject of much criticism (Suchman, 1987; Berg, 1997). However, it is my argument that the two understandings of *cognitive explanations* differ in several ways. The traditional cognitive arguments used in CSCW have been a part of the discussion for several decades, and many of the “original” concepts are still used in the contemporary CSCW debate.

Modern cognitive explanations seem to be less rigid and spanning over a shorter period of time. When nurses and psychiatrists talk of cognitive schemes, they talk of reactions and perceptions “opfattelser” with a short time frame, not the “big plans” traditionally referred to in CSCW literature. The “cognitive” processes also seem much more flexible, in that they are altered and adapted by the person in the concrete situations. Modern cognitive theories also seem less eager to explain all of the facets of human activities. Instead they focus on details (thoughts and perception) in concrete situations.

The statement presented here are not based on a large body of evidence. However, it is my general opinion that the cognitive theories, as they are practiced in the field of psychiatry, can provide valuable arguments to the theoretical discussion within the field of CSCW. Modern cognitive theories are relevant when trying to account for human behavior. At least, a reevaluation of cognitive theories could result in *cleaning out* of all the old and discarded arguments that are brought up in the contemporary discussion.

Another important aspect is the issue of *generalization*. In other words, in which other areas can findings be used as arguments in a discussion.

The field of Medicine is a very wide one, as noted in the beginning of the report, which contains numerous different specialties. All of these areas of specialization have each their different practices. Documentation practices and the form of the documentation are equally different. Berg (1999) studied EPR technologies used in Intensive Patient Care. The data documented there was primarily in a short and numerical form, a form that differs radically from the long textual descriptions used in the field of Psychiatry. Further studies of the differences of medical documentation could provide valuable information that could further the design of EPR tech-

¹Such as Freudian and Psycho-dynamic theories

nologies.

Differences also exist within a single medical field. According to the EPR coordinator, many different documentation practices exist at the different sections and wards at SHH. Setting common standards for the documentation work has proved to be a difficult task for the clinical management. Further studies of the differences in documentation practices in other practice fields are potentially valuable and could contribute with findings, not visible in a single set of observations.

In the same way, studies focusing on other professional groups than the nursing group could also provide valuable contributions to the understanding of medical documentation practice. In particular, the documentation practice of the psychiatrists seem like a natural extension of the work described in this project. A comparison of the documentation practice of nurses and psychiatrists (doctors) can provide a better understanding of both practices.

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