

# IT-Support for Teamwork in Care Processes

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## Abstract

*Health Care organisations are changing, focus is shifting from isolated measures to processes performed by teams. This study aims to investigate the need for IT-support in the creation of teams for care processes, from the point of view of ten personnel at a hospital and linked primary and municipal care involved in the care processes for diabetes. Discoveries from the empirical study are discussed in the light of Computer Supported Co-operative Work. IT-support is applicable for making personnel aware of the development within the team of care processes and it would increase the overall efficiency in the exchange of information and so improve the quality of care.*

**Keywords:** CSCW, care processes, work articulation, shared information space

**BRT Keywords:** D, F

## Introduction

Health care organisations have been, and still are, going through large changes due to reductions in funding. The organisations have been forced to close clinics and to dismiss personnel. As a result there is severe pressure on the organisations for rationality and effectiveness and in order to meet these requirements new organisational structures are being created. The changes range from the early ninety's profiling and competitiveness between health care organisations to collaboration and co-operation, and have the overall aim of reducing costs while still being able to ensure the quality of care (Dahlquist A, et. al, 1996).

The aim of this study is to investigate if there is any need for IT-support in the health care organisations concerned with the information sharing in the creation of teams for care processes. The following hypothesis is investigated: *There is a lack of communication in the care processes between organisations, i.e. the hospital and the external organisations, the linked primary and municipal care, there is a problem to keep information up to date and old memos exist in various versions.*

The purpose is also to discuss the results of the investigation in the light of theory from the research area CSCW in terms of sharing information and work articulation.

The health care organisations are large and complex organisations divided into county, primary and dentist care in which different managers with different budgets conduct the development in the different organisations. In addition there is also the municipal care including care for the elderly. There is now a need for collaboration and

co-operation within and between these organisations. Information technology is already used to some extent to support this, facilitating information sharing and communication. However, the current situation concerning IT-support in the health care organisations varies greatly. Different regions of health care organisations have developed in different ways. Different IT-support has been implemented using different platforms and software. Communication within and between the organisations is still, to a large extent, performed via traditional paper mail and telephone.

The paper begins with a brief overview of some issues from literature describing the use of information technology within the health care area. This is followed by a description of the method used in the study. The next section provides a brief overview of CSCW theory, with the respect to sharing information and work articulation. This is followed with a description of the field site where the study is conducted, describing the care processes and the teams comprising of representatives. The next section provides a detailed analysis of the representatives' perception of the current situation. The paper concludes with a discussion of the findings in the study that is discussed in the light of CSCW theory concerning the applicability of theory around sharing information and work articulation within the field at study.

## **IT-support in Health Care**

To a large extent development and research in this area concerns the patient record, often illustrated as the hub of the care information (e.g. Petersson G. and Rydmark M., 1996), where all information of interest is collected. Both from the point of view of the patient and from the point of view of different care providers who need to know the history of a patient and the patient's treatment as well as planned treatments in order to maintain the quality of care. Presently the conflicting perspectives, as well as laws, constrain the organisations from optimising the use of this information across clinics.

Communication between health care providers attracts much attention, as is shown by the many articles published on the subject. A review paper by Branger and Duisterhout (1994) points out the importance of well functioning communication between care providers:

"The quality of communication between medical-care providers highly influences the quality of care"... "Inefficient communication between these care providers may have undesired effects such as conflicting therapies or duplication of diagnostic tests, thereby wasting financial resources and negatively influencing quality of care" (Branger and Duisterhout, 1994, p69).

The same paper highlights the technologies of current and future use for communication; fax, electronic mail, Electronic Data Interchange EDI, Smart Cards, ISDN and telemedicine. The point that is made is that in medical informatics, communication is no longer restricted to dedicated point-to-point connections within one department or institution. Health care providers in different organisations and different location exchange message in either textual form or as special types of data, such as images, ECG signals, etc. This requires standardisation on different levels, health care specific; terminology and semantics, as well as Information Technology Related; data models etc. and Telecommunication Related (Branger and Duisterhout, 1994).

Branger et al. (1993), studied the effects of the introduction of EDI between primary and secondary care providers on the speed of communication, efficiency of data handling and the satisfaction of General Practitioners (GP) with communication. The

study was comparing traditional paper based communication for laboratory reports and admission-discharge reports between hospital and GPs and EDI at 27 GPs and 2 general hospitals. The conclusions were that electronic communication between primary and secondary care providers is a feasible option for improving communication. Laboratory report taking from two to four days with traditional paper based communication decreased to one hour via EDI.

Sharing and Communicating Health Care Information was one of five areas addressed at a working conference held in Washington DC 1993. (Silva J.S. and Ball M.J. 1994).

"Exchange of information among health care professionals requires the communicating parties to agree on a communication channel, an exchange protocol, and a common language" (p82).

The technologies addressed in the article were particularly concerned with Internet search tools such as World Wide Web (WWW) and gopher etc.

In a licentiate thesis concerning IT in health care (Stegberg, 1996) a study about IT-support for communication, co-ordination, collaboration and learning for patients diagnosed with autism was conducted. Stegberg's work was concerned with the confidential information the patient record and he shared the view of the patient record as the hub of care information. The idea was to make this the tool for co-ordination, collaboration, communication and learning for the people involved. It was concluded that the computerised patient record could serve as the central tool facilitating this co-ordination, collaboration, communication and learning for the whole team, and as a result a model of an IT-support for this purpose was proposed. This model was based on locally accessible health care records, according to the law of secrecy, to support co-operation, co-ordination and communication. This was to be combined with the use of unrestricted data, stored in externally accessible databases, using Internet technology, to support learning for staff and teams involved in the diagnosis of autism.

This study was primarily inspired from Stegberg (1996) concerning IT to support information sharing and facilitate the collaboration within the care. However, this work attempts a new perspective focusing on unrestricted information only, and is directed towards the personnel and their daily work in the process of learning and the creation of teams for specific care processes.

Whilst changing the traditional clinic based thinking into new process thinking across clinics and organisation within these teams for care processes, a large amount of new knowledge and new experience has been gained. The structuring introduces a new way of thinking into health care organisations, which is to focus on the process rather than isolated measures within the clinics. New directives, guidelines and other information are generated from the team for care processes, which is relevant for personnel involved in this work. Sharing the information and making it accessible for all personnel involved would possibly facilitate both learning and improved collaboration between the personnel within and between different organisations and in effect also improve the quality of care.

## **Method**

The aim of this study is to investigate the need for IT-support for unrestricted information to enable information sharing and facilitate learning for the personnel involved in the

team for care processes for diabetes. The work applies theory from the area of CSCW with the respect to *sharing information* and *articulation work*, and uses a qualitative method to investigate the need for IT-support in a team in a health care environment. Where the team comprises of the different professions involved in the teamwork of the care processes.

The study was conducted through interviews of the members in the team for care processes using qualitative interviews, in a non-standardised way (Svensson and Starrin, 1996) with open questions. In total fourteen people were interviewed, ten of these people are directly involved in the team for care processes for diabetes, the other four are involved in administrative and management work. The choice of the interviewees was made with the aim of covering all the professions involved in the teamwork for the care processes for diabetes. The interviews varied in length between 30 to 60 minutes.

The main question of the study is concerned with the information flow between the members in a team for care processes, here referred to as *representatives*, and other *personnel involved* in the care processes but who are not a member of the team. With the respect to relevant information generated in the creation of care processes. The question was concerned with the information flow around the team and to determine whether the information flow in the current situation is sufficient. The teamwork creating a care process is regarded as iterative and is constantly evolving over time.

The interviewees directly involved in the team for care processes have also been questioned from the perspective of being one of the *personnel involved*, by giving their views on the information flow from other teams for care processes. Teams where they themselves are not members of the team but involved in the care process. This was done in order to collect some information concerning how the “personnel involved” were being informed with relevant information from the work within a team for care processes. Conducting the interviews, giving the interviewees a double role, was done in order to keep the number of interviews down to a size befitting for this work and its framework.

The data obtained from the interviews was iteratively analysed by the author where the perceptions from the interviewees were used in order to comprehend the possibility and need for IT-support for the personnel in their daily work in the creation of teams for specific care processes.

## Theory

The field of CSCW will serve as a theoretical framework of this paper focusing on the concepts of *information sharing* and *work articulation*.

Bannon and Schmidt (1991) raised the point that it is not clear of what constitutes the unique identifying elements of Computer Supported Co-operative Work (CSCW). It is a research field where one can find a number of perspectives and the authors exemplify various co-operative work and various domains, e.g. administrative work as co-operating at a distance without direct communication and without knowledge of each other via a shared information space.

”shared information space, that is, a ‘space’ comprising data, personal beliefs, shared concepts, professional heuristics etc.” (Bannon and Schmidt, 1991, p 6).

A shared information space allows an organisation to collect important guidelines, directives and other information important for creating a common foundation in the organisation for all personnel. The authors put forward the core issues of the CSCW field

as being; *articulating co-operative work, sharing an information space and adapting the technology to the organisation, and vice versa.*

Sharing an information space is the main issue of interest for this study and Bannon and Schmidt brought up three important aspects of a shared information space:

1. It must be transparent - Revealing the ownership of information and responsibility for its upkeep
2. It must reveal the identity of the originator of information in databases and strategies and the perspectives applied in producing the information
3. The problem of misrepresentation of information due to the fact that it has been generated, gathered and communicated in a context of incongruent goals.

Another important concept is introduced by Clement and Wagner (1995) when discussing articulation work and its obverse, which the authors call disarticulation, from four different types of settings; occupationally segregated terrain, emergency situations, scarce-resource settings and performance-intensive settings. The authors mean that the first setting is found in large, mature, formal organisations operating in relatively stable environments, and the other settings can be regarded as variations in such an organisation.

"Hospitals, for example, are highly regionalised interaction spaces with physical boundaries between different regions such as wards, the surgical tract, laboratories, kitchen and laundry. Most of these regions are inhabited by people with different occupational backgrounds and will physically never be entered by others. The interactions of physicians and nurses can be located in specific regions of the hospital, e.g. an outpatient department, in which they convene from different parts of the hospital to pool their knowledge for the treatment of patients. The regionalisation perspective spatially operationalises issues of interdependence and power. Patterns of access and exclusion in a hospital reflect a complex web of occupational hierarchies inscribed in the distribution of competencies and responsibilities" (Clement and Wagner, 1995, p. 35).

Clement and Wagner (1995) emphasises that even though CSCW is derived from a commitment to establish shared contexts, it is important to examine carefully and respect the control requirements of different groups of users along with the "politics" of sharing and withholding, inclusion and exclusion in an organisation. The authors mean that CSCW case studies show the need to distinguish between interaction aimed at sharing or exposing and those that aim to hide or maintain boundaries.

They also point out that scarce-resource settings often tend to lead to co-operation and collaboration in order for the organisation to survive with the resources available. Health care organisations are presently under severe pressure of reduced resources.

"The scarcity of time, money, people, technologies or access to information may constrain the performance of an organisation and create a strong pressure to co-operate and share across boundaries" (Clement and Wagner, 1995, p. 40).

One of the important conclusions made by Clement and Wagner is that when designing CSCW applications it is necessary that the circumstances in the organisation concerning communication be considered with respect. To allow people to choose the means of communication rather than being forced into a communication situation which is undesired.

CSCW design should take account of the regionalised character of "real world" communications and by offering tools for creating a corresponding multiplicity of communication spaces, provide the technical basis for the necessary negotiations between the actors involved"(Clement and Wagner, 1995, p. 48).

It is worth noting as described in Hasman et al (1992) the results of the standardisation efforts and an evaluation study concerning EDI. In the study ten different types of standard messages have been defined and used for exchanging information between hospitals, GPs and pharmacies. It is concluded that relatively large timesaving can be obtained when communicating electronically. However, it was also concluded that work patterns and co-ordination are necessary in order to take full advantage of the technology.

"In general it can be concluded that the workpatterns of the hospital, GPs and pharmacists have to be coordinated in order to make optimal use of the time gain resulting from electronic communication" (Hasman et al., 1992, p. 167).

Some important aspects concerning the concepts of information sharing and work articulation have been illuminated here and will be applied to the results from the empirical investigation in the discussion of this paper.

## The Empirical Study

The study was conducted at a small hospital in the Southwest of Sweden, Skene hospital, and linked primary and municipal care within in the team for care processes for the diagnosis of diabetes.

### Teams for Care Processes

Beginning in 1993 Skene Hospital has, at the request of the county council, carried out extensive work concerning the structuring of the process of care for different diagnoses. The aim has been to provide all personnel involved in the process of care with an understanding of the wholeness of the process with the patient at the centre. To be able to see where and how an isolated measure fits in the whole treatment of a patient. The structuring was begun in order to gain better quality of care and to improve management information regarding costs and resources per patient of a certain diagnosis. This is in order to make it possible to improve cost efficiency and also to assure patients of equivalent treatment independently of where the care is provided.

The process thinking is further explained by describing how the hospital distinguishes between the concepts of therapy line, care processes and program of care.

*Therapy line* - (TL) is a local concept and means a continuous process of treatment of a patient's disease during the time the patient is given treatment within the hospital wards or in outpatient clinics.

*Care processes* - means a continuous process of treatment as above, but where primary and municipal care is also included.

*Programs of care* - often means a locally created program of treatment concerning prophylactics, diagnostics or therapy for after-care for a certain group of illness.

These concepts are summarised in the handbook for therapy lines written at Skene Hospital as:

"Programs of care are developed from science and well tested experience. A program can consist of co-operation between care providers from different parts of the care processes. A program of care specifies what shall be done. A therapy line or a care process is an organisation of the process clarifying how it shall be done" (Translated from Granath-Sundquist et al, 1996).

The differences of the concepts are the scope of organisations involved in the co-

operation.

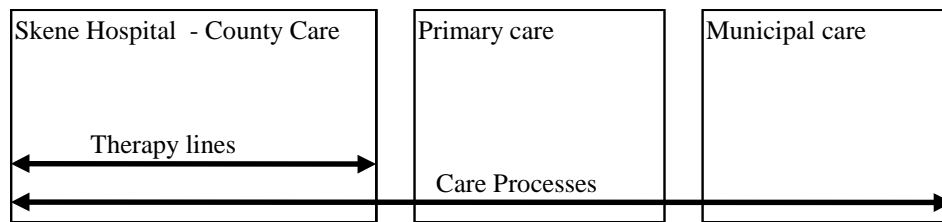


Figure 3. Scopes of TLs and care processes (own figure).

Figure 3 illustrate the different scopes for TLs and care processes. TLs stretch across clinics within the hospital while care processes extends across organisational boundaries. The concepts stand for structured processes that are based on the diagnosis. This means that for these processes it is the treatment of a particular diagnosis that is crucial - not one single patient. A TL or care process involves all patients of the particular diagnosis of interest.

The team for care processes for diabetes was created from the beginning to be a care process. Other diagnoses (e.g. myocardial infarction, stroke and tumour) began as therapy lines and are working on expanding the teamwork with the external organisations. The hospital's aim is to create teams for care processes for all existing therapy lines.

## Representatives

The creation of these care processes has been carried out in projects where a team of representatives has held regular meetings. Representatives are personnel from each profession and from all clinics or organisations involved with a certain diagnosis, who participate in analysing and describe the different measurements involved for a patient with a specific diagnosis in order to describe and model the care process. Representatives will be referred to in the text as representatives of the care processes (RCP). A general view of RCP's responsibilities is to contribute to the team in the care process with information about their work, and to inform all others in their profession and organisation of relevant information from the team work in the creation of the care process. However this is not clearly defined and different RCPs have taken on different roles. Some of them represent a whole clinic rather than a profession and some both.

The teamwork within these care processes is planned to continue their evolution of their models of processes within each diagnosis team. During the time these care processes have been created and evolved, there has been no IT-support to store these new directives and experiences gained from this work. The information has been spread via meetings, some lectures and seminars plus formal documentation in the form of minutes from meetings that are held regularly for the teams for TLs, teams for care processes and also between TL managers and the manager of the hospital. During 1996 the project was summarised in a handbook for TLs, (Granath-Sundquist et al 1996) which is distributed at the hospital.

## The Results

The intention of the empirical study has been to try to comprehend the wholeness of the

current situation concerning the information flow around the teamwork in the care processes for the diagnosis diabetes. The results are described from the following areas derived from the overall topics of the interview template, where the different interviewees' experiences and perceptions are presented and described within the area.

1. Receiving information about the care processes when becoming a RCP.
2. Possibilities to refer to and to distribute information as a RCP.
3. Presently receiving information generated from the care processes.
4. Presently receiving information about other care processes, or therapy lines.
5. General attitudes towards implementing IT-support for this purpose.

In the presentation different views, opinions and associations given of the interviewees are presented. Since the study was performed in Swedish and the paper is written in English, adequate quotations are not possible. Therefore the statements are not quotes but translations by the author. There are no requirements of anonymity in the study, however the interviewees will be referred to as following letters to make the text briefer and hopefully easier to comprehend.

(A) district nurse	municipal care
(B) district nurse	primary care
(C) two diabetes specialist nurses	county care
(D) district medical officer	primary care
(E) senior physician	county care (the manager of the care process)
(F) medical social worker	county care
(G) nutrition specialist	county care and primary care
(H) physiotherapist	county care
(I) assistant nurse	county care

### **Receiving information about the care processes when becoming a RCP.**

This topic was raised during the interview in order to determine how RCPs were informed about the care processes when becoming a RCP. If they were informed about what a care process is and what was expected in the teamwork, their role, tasks and responsibilities.

(C) expressed explicitly that they lacked information and directives when starting and also mentioned that the "Handbok för terapilinj" by Granath-Sundquist et al. (1996) would have been useful to provide the basic understanding of what care processes is and what the teamwork is aimed for.

(A, F, H and I) expressed split opinions about this. They received information and facts about the disease but lacked directives for the work in the care processes and found it difficult to know their role in the team.

(F)"...my own role in the care processes for diabetes was unclear to me for a long time - with the result that during that time I was not very active in the teamwork for care processes."

Certain amounts of self-criticism were expressed, saying that they had not been active members of the care processes. However, they did express how they felt communication had developed over time and now served as a support to establish work directives, responsibilities and roles within this teamwork.

(B, D and E) did not express any lack of information or directives, nor did they express any difficulties finding their roles.



(H) pointed out that the RCP of the profession physiotherapist has been exchanged several times, due to personnel moving, and expressed a concern for lost knowledge when personnel moved and there is no articulated area for collecting information and knowledge. (H) could see a risk that all information and knowledge then would disappear with the personnel moving or for other reasons leaving the work.

(E) describes the work within the care processes as to keep up to date with new methods, medicines and the research of the field. To keep up to date with national board of health and welfare and their directives, although national guiding principals are distributed in print. (E) points out that care providers concerned with the diagnosis diabetes have been used to work in team since the beginning of the 80's and to share information between them.

### **Possibilities to refer to and to distribute information as a RCP.**

In order to determine if it was possible for RCPs to refer to and to distribute information generated at the team meetings this topic was brought up in the interview. The number of personnel different RCP represent varied considerably. For instance (A) represents 54 district nurses and (F) represents one other medical social worker, while (C) have taken on the roles to represent large parts of the whole county as well as supporting primary and municipal care.

(C) "...we have taken on to represent quite many, the county care in Alingsås and Borås as a kind of back up, plus the wards and clinics at Skene hospital and the primary and the municipal care. The idea is to start spreading information and make it continue to spread, hopefully like ripples spread on the water..."

The results illustrate that most information is spread via meetings. In the county care this seems to work well. Heads of the wards are obligated to let all RCP report from their care processes or therapy line. This seems to make information flow satisfactorily in Skene Hospital. However, there seems to be limits and some information is easily lost after all.

(C) "...it is difficult to distribute all the small detailed information, and it is possible that it stays in the group".

The primary and municipal care raises other problems to distribute information. They have regular meetings where they can distribute information. However, they are as a group both larger and more spread geographically which seems to affect the distribution and make it more difficult.

(D) "It is difficult to distribute information because the personnel have no e-mail"... "the district nurses are connected, it would be good if also municipal nurses were connected"... "A lot of the information have been interpreted as coming from the top - and therefore been received a bit negatively"... "Written information need to be written so much less controversial in order to be accepted".

### **Presently receiving information generated from the Care processes.**

How information was currently received was discussed in order to see what different means of communication were used in the current situation and how the RCPs experienced this. The result clarifies that all RCPs receive information through meetings held in the care processes plus all memos and other generally distributed information. All RCPs keep their own paper-based file where they collect all information generated from

the care processes. This is where they turn to when they need to go back to information. It was also indicated that the meetings for the care processes are useful and highly appreciated among the RCPs to meet and exchange and discuss information. It is especially the physical meetings and the possibilities to talk and discuss under these forms that were expressed as valuable.

(A) "The care processes and the meetings they hold has become a place to acquire and exchange knowledge".

The need to keep information up to date was pointed out by many. It was expressed how they felt that information got out of date more quickly and the individual responsibilities to have updated and correct information.

(A) "The need of information has changed - now it requires to be more regularly updated, and as an individual one is required to make sure information is up to date".

It was explained how the work within a team of the care processes differs over time and the need for information is often what determines when and how to continue. It was also emphasised by (E) that the therapy lines were created originally from the need for information. Another point brought up by (I) was that the information was not always easy to apply for each and everyone in their work tasks.

(I) "TLs are at a different level. As a staff nurse you don't feel you participate. You have to understand the wholeness, the primary and municipal care of which we have no knowledge, by ourselves".

A point made by (G) is that most physicians and nurses discuss questions concerned with diet with the patient and most physicians and nurses give different directives, which is often very confusing for the patient. (G) is convinced that the care processes and TLs can contribute in a positive way to minimise the difference between directives given by different care providers.

Another aspect brought up by (B) was the concern for a too intense specialisation, with a conceivable loss of knowledge, where the specialisation within these care processes representatives got to know a great deal about one particular disease of interest. (B) being a district nurse depends on extensive knowledge in her work in order to be able to handle all possible diseases or illnesses that may occur correctly. (B) also expressed a concern that care programs as would become to much of checklists and that the use of these will impoverish own initiatives and judgements among care providers.

## **Presently receiving information about other care processes, or TLs.**

Few of the RCP receive information from other teams for care processes or TLs. TLs are taken in to account here since many of the TLs do not yet fully exist as care processes. There were only two satisfied interviewees who were satisfactorily receiving information from other teams. The explanation for this is that these interviewees work in wards where many of the personnel are RCPs in many different teams. Since every RCP shall inform about the care processes or TLs at the ward meetings, the personnel at these wards receive information about all the teams represented. Other wards are less fortunate and may have only one care processes or TL represented and will therefore only be informed from this particular team.

The other interviewees could all see a need for and expressed an interest in, receiving such information. Especially primary and municipal care expressed the lack of information of other care processes and also saw the need for their existence.

(A) "I do not receive any information from any other care processes - but no one else works as care processes - only as a therapy lines".... "I would like information about them all".

(B) "I do not receive any information from any other care processes".

(D) "As a care processes only the care processes for diabetes works. Other therapy lines do not distribute information, although there are many of these therapy lines which there is a need for a team work as a care processes".

The statements above show the municipal care and the primary care perception of the current situation. Within the county care the communication between care processes seem to function less satisfactorily for those working at wards where only one or a few care processes were represented.

(C) "We are not informed of other care processes - but we don't collect information either because there is no time"... "there is a need for information about news in the own team and in other care processes as well which we do not receive".

(G) "I do not receive information about other care processes or therapy lines with the result that I don't get the same understanding".... "I have to actively find out through contacts, but it is a small place and the relationships are good".

The care processes contribute in a positive way according to many of the RCP. RCP who do not receive information from other care processes in their ward feel that the meetings in the team help in this matter. Often RCPs are RCPs in more than one care process or TL and therefore can contribute with information about others care processes at a meeting.

(C) "I receive some of the information about other care processes via the own care processes meetings, partly from the leader of the team and from other RCPs who are also RCPs in other care processes".

The interviewees also stated that a great part of the information is spread informally. The organisation is a rather small working place. Personnel all know about each other and know who to turn to.

## **General attitudes towards implementing IT-support for this purpose.**

This topic was discussed in order to determine the general attitude towards IT-support. Many could see the potential of having access to more information. The practical aspect of having the information, both national and international news and directives, easily accessible was brought up. The potential for storing information and facilitate easier updating procedures and provide more reliable information was recognised.

(C) "I can see that computers are a positive aid to collect all information, and I agree with the manager, he has a point about all the old memos and information that is not up to date".

Other views put forward were the possibility to easier share information about all TLs and/or care processes, more independently of representatives.

Negative views put forward were concerning previous experience of computerisation having involved additional work rather than rationalising work. Other sceptical views were regarding the ability to use the computers, both from a personal point of view feeling a lack of knowledge as well as the computer as an information source. Putting forward the argument of being able to bring a book at home and read

compared with being unable to bring the computer at home.

(C) "The computerisation up till now has involved additional work rather than being a help and reducing the work - but the reason for this is also the lack of education in IT".

(H) "I'm not at all familiar with computers so I am a bit afraid towards computers, it is all new to me. And we don't work with computerised patient record at our ward either".

Sceptical views regarding computerisation were sometimes ambivalent and at the same time recognising the advantages particularly about keeping information updated and accessible. The view that personal meetings were important and must not be lost was emphasised.

(D) "I am sceptical towards an IT-support, but paper file is a problem to keep up to date, and it often only exists one copy which often is placed in the other end of the clinic".

(D) "I believe in personal meetings and education for all about a certain subject instead of spreading paper or making it accessible on the computer".

The result illustrates many views and opinions. Mainly an interest and recognition of advantages in implementing an IT-support for this purpose. Expressed sceptical views concerned to a great extent earlier experiences where computers often were regarded as the number one solution, but the actual effects of the computerisation has so far not involved less work. Time is one of the crucial issues and the personnel's experience is that computers tend to consume a lot of time from the personnel using them.

## Discussion

The discussion of discoveries will first attempt to look at the expected findings, referring to the assumptions made beforehand, in the investigation and thereafter look at what additional discoveries were made in the investigation.

### Discoveries confirming assumptions

When the idea for the study was presented to Skene Hospital following assumptions about the current situation were made by the manager of the hospital:

1. *There is a lack of communication in the care processes between organisations, i.e. the hospital and the external organisations, the linked primary and municipal care.*
2. *There is a problem to keep information up to date and old memos exist in various versions.*

Both these assumptions were confirmed in the result from the investigation. The lack of communication was pointed out not only from the external organisations but also internally concerning detailed information. All RCPs from the different organisations relied on the fact that it is together a small organisation. Everybody knows everybody and to contact somebody for help or to ask questions is not a problem. One knows who to contact and how. The problem to keep information up to date was pointed out from all RCPs in all the organisations.

### New Discoveries

3. *There was a lack of information and directives at the beginning when becoming a*

*RCP.*

4. *There was a problem to discover one's role as a RCP in the team.*

These points illustrate the need for documentation about what TLs and care processes are. What the aim is and how the expected work is to be conducted for different professions as well as for different roles within the team. However, the handbook Skene Hospital written Granath-Sundquist et al. (1996) is likely to provide such information if distributed.

5. *There is a risk that all information and knowledge is lost with the personnel moving or for other reasons leaving the work.*

This arose from a RCP's experience, since her profession has changed RCP a number of times. Possibilities were discussed about how the problem could be minimised if a shared information space collected important information and thereby made the information independent of single personnel.

6. *There is a problem receiving information from other care processes unless you are a RCP or attend meetings where RCP for the care processes report.*

The problem of receiving information from other care processes was common to all interviewees unless they were a RCP or had other RCPs at the clinic or ward in which they worked. RCPs expressed the need and interest in being able to share this information and also regarded this as a lack. A shared information space would be a possible solution to this problem. Many RCPs expressed the imagined potentials with such an IT-support.

7. *One aspect all RCPs agreed on were the lack of time, which seems to be the crucial issue.*

The lack of time was undoubtedly a crucial issue by all RCPs for the current situation and also an important question for whether to implement IT-support or not. The experience of the computerisation in the care varied among the interviewees. Some had experienced that computers involved more work rather than the opposite, while others had experienced only advantages.

8. *There is a concern that the changes will result in too intense specialisation, with a conceivable loss of competence.*

The care processes or TLs within the hospital aim at co-operation and collaboration between the different care providers and often specialists in different medical areas. However, in the primary and municipal care a broader perspective and knowledge is required, it was put forward as a possibility that involved RCP in different care processes specialise at the expense of the generality in their knowledge. Will the accessibility to the information of interest for the care processes incite this apprehension?

9. *There is a concern that care programs would become checklists and that the use of these will impoverish own initiatives and judgements among care providers.*

This concern is expressed again as a matter of how the care is performed and not necessarily dependent on the question of IT-support. However, one can discuss whether having a checklist easily accessible, automatically kept up to date by others, removes the individual responsibilities and may affect the quality of care, but that is a discussion outside the scope of this work.

10. *There is a belief that the care processes and TLs can contribute with a change for the better to minimise the difference between directives given by different care providers, which confuse the patient.*

The accomplishment of this belief would most certainly be assisted with IT-support to share information.

The discoveries discussed above are all concerned with the care processes and

information flow. The question of IT-support detached from the above aspects will now be discussed in order to illuminate the perceptions and opinions of the interviewees.

## **The question of IT-support**

The result illustrates different opinions from the group interviewed. The attitude is not united and many of the interviewees expressed doubts and questions about IT-support as well as recognised potentials and opinions in favour of an IT-support.

The lack of education concerning the use of IT is one aspect raised. The additional work time involved in current computerisation is another aspect. This is not only dependent on the lack of education in IT. Currently implemented computer systems in the care which have no ability to communicate and transfer data between the different systems is another reason which causes doubling of the work tasks and additional work time.

The possibilities and potentials of IT-support were brought up. The possibility of sharing information about all TLs or care processes was regarded as an advantage. Also the possibilities to link external information (e.g. the national board of health and welfare) and possibly international links to be able to read about care processes in other countries.

## **The empirical results in the light of CSCW**

The field from which the empirical results are derived can be described as Clement and Wagner (1995) call an "occupationally segregated terrain". Health care organisations are large, mature, formal organisations operating in relatively stable environments and they are quite often described as conservative and slow in its organisational structure.

The health care is now also a scarce-resource setting (Clement and Wagner, 1995) due to the reductions in funding. As the authors describe this often tends to lead to co-operation and collaboration in order for the organisation to survive with the resources available. The creation of teams for care processes can be regarded as *co-operation and collaboration derived from the current scarce - resource settings in the health care organisations*.

In order to facilitate this co-operation and collaboration currently shared information is managed via the meetings of the care processes and by the individual RCPs. However the results of the investigation illustrate the need for a shared information space and IT-support to collect all shared concepts, new guidelines, new directives, new memos and new care programs etc. (Bannon and Schmidt, 1991).

There are a number of aspects to consider when sharing information as are discussed by Bannon and Schmidt (1991). Firstly, the information must be transparent. It must reveal the ownership of the information and the responsibility for its upkeep. This would be an important aspect in an IT-support for the care processes. Teams for care processes are structured independently from each other. Anybody as an RCP in a team could be responsible for the information and its upkeep, independently of profession or organisation. Every team for care processes could own and be responsible their specific information.

Secondly, Bannon and Schmidt say that it must reveal who is the originator of information and what strategies and perspectives were applied in producing the information. This is also important for and applicable in the teams for care processes. Strategies and perspectives applied when producing the information are also independent

from other teams for care processes and can be indicated in the IT-support together with the originator of the information.

Thirdly, Bannon and Schmidt highlight the problem of misrepresentation of information due to the fact that it has been generated, gathered and communicated in a context of incongruent goals. Although, the whole idea of teams for care processes is to create common goals and ways to go about these goals, this is probably a long term problem which is not so easy to accomplish using IT-support.

Clement and Wagner (1995) talk about the patterns of access and exclusion in a hospital, which are currently built on occupational hierarchies marked in the distribution of competencies and responsibilities. This is likely to remain so for a long time, however, the teams for care processes are dissolving some of this rigidity, bringing all the professions together to learn about each others work in order to comprehend the whole process.

The reluctance to share information in an organisation of occupationally segregated terrain described by Clement and Wagner (1995) seems to be valid at the formal level. However, many of the interviewees described the informal communication channels as a rich source for exchanging information. This communication was described as functional both within and across organisations. Although the implementation of formal communication channels across organisations to support the personnel in the care processes may be contrary to the organisational structure, there is an expressed need and interest by the personnel in such communication channels.

The conclusions of Hasman et al (1992) that work patterns and co-ordination are necessary in order to make full advantage of the technology, can be regarded as agreed by the RCPs about the care processes. RCPs pointed out how they can already see a difference in their understanding of the whole process in the care processes and the articulation of the work, which leads to the optimisation of the work in the care processes.

However, a very important aspect when implementing an IT-support would be to maintain the personal meetings and other communication channels. This point was brought up by many of the interviewees and supports the conclusions made by Clement and Wagner (1995) that when designing CSCW applications it is necessary to allow people to choose the means of communication in order not to force people in to communication situations undesired.

## **Conclusion**

The discoveries indicate a perceived need for IT-support by the personnel. Firstly, to be made aware of the development within the care processes (discoveries 3, 4 and 6). Secondly, to increase the overall efficiency of the exchange of information to improve the qualities of care (discoveries 1, 2, 5 and 10).

The discoveries made in the empirical study confirm the aspects of the theoretical framework as described in the literature of CSCW. The co-operation and collaboration can be seen as derived from the current scarce - resource settings in the health care organisations as discussed by Clement and Wagner (1995). Clement and Wagner also discuss the patterns of access and exclusion in a hospital built on occupational hierarchies which is confirmed. The need for a shared information space comprising data, personal beliefs, shared concepts, professional heuristics etc. as discussed by Bannon and Schmidt (1991) was confirmed. The reluctance to share information in an organisation of

occupationally segregated terrain as described by Clement and Wagner (1995) was also confirmed. The necessary work patterns and co-ordination discussed by Hasman et al (1992) in order to make use of technology was also confirmed by the interviewees experience of how the articulation of the work already had lead to optimising the work in the care processes.

However, it is important to emphasise that IT-support can not be seen as the complete solution. There is a continuous need for both meetings held within the team for care processes and educational meetings, in order to provide the choice of means of communication as discussed in Clement and Wagner (1995).

Due to the limitations of this study many aspects are left to discuss in more detail, both empirical and in particular theoretical aspects. The study has provided additional ideas for further research, concerning different teams and care processes but also other work situations within health care where the change is still in process towards more collaboration within and across organisational boundaries. Another interesting possibility would be to implement an IT support for the team of care processes for diabetes in order to be able to test and analyse such an implementation on a small scale which would be of use in the future when implementing a full scale system.

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