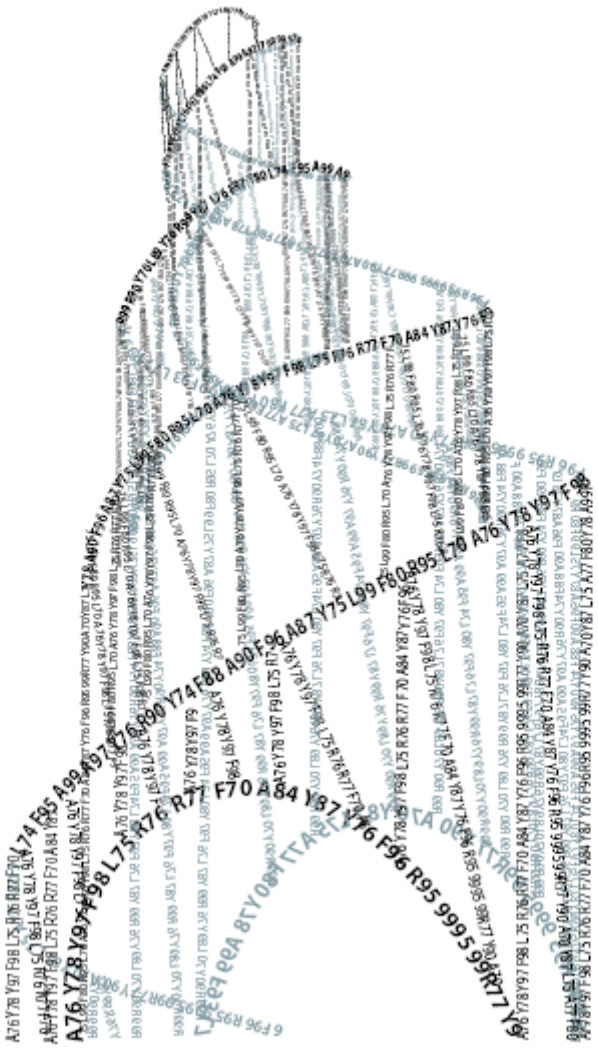

CONNECTING PRACTICES

A study of electronic patient records at work in primary health care

Brit Ross Winthereik

Connecting Practices

an electronic patient record at work in primary health care

Verbindingen maken

het elektronisch patiëntendossier aan het werk in de huisartspraktijk

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Preface

This dissertation is the outcome of four years of research. During those years connections have been established between a number of people, places, institutions, research communities, and me. It is hardly possible to express my gratitude for the work carried out by so many people in many different places to help me develop into a decent researcher. It is, however, also impossible *not* to do so.

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Brit Ross Winthereik,
Copenhagen, July 2004

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Introduction

> "Adequate measurement, clearly, means disciplining people as well as standardizing instruments and processes. Until this has been achieved, measurements will be unreliable. So long as inconsistencies remain, the discharges measured cannot be effectively quantified, no matter how many numbers have been gathered. Indeed, specifying them is not enough; the specifications must be put into effect at millions of diverse locations, by calibrating millions of instruments and millions of people to the same standard." (Porter 1995: 28).

> "Accountability means living up to the norms, doing so in a way that is transparent; showing what you do, getting appraisal. I don't mind offering a view into my 'kitchen', as long the norms are clear. As long as it is about things that I am able to change and as long I benefit from it." (Dutch GP cited in *Mediator* 2003, vol. 14[7])[1]

The questions

In his seminal work *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life* (1995) T. Porter discusses the relationship between objectivity and standardization. Porter examines how, to count as objective, knowledge has to be made impersonal, i.e. detached from those who produced it. He also demonstrates how, historically, this process has involved much effort in terms of calibrating practices and instruments. Porter is interested in the widespread use of 'numbers' as the foundation of true knowledge, and sees them as primarily a communication tool that enables the linking of different communities in time and space.

In the second quote, the focus moves from an overall focus on measurement to an individual general practitioner's experience with being 'made measurable'. The general practitioner (GP) explains what external measurement and evaluation means to him and we see how living up to norms defined elsewhere implies self-management and an effort to 'make oneself measurable'. The quote expresses the GP's interest in living up to such external standards, yet he only wants to be measured on things that he can change and benefit from. There is a paradox in this; the GP does not

[1] "Verantwoording betekent aan de normen voldoen, daar transparant in zijn; het laten zien en daarop afgerekend worden. Voor verantwoording wil ik best in mijn keuken laten kijken, zolang de normen maar helder zijn. Als het gaat om zaken die ik zelf kan beïnvloeden en als me dat ook iets oplevert." The English translation is mine.

mind external evaluation, but at the same time, he wants to be able to influence the norms on which the evaluation is based. The quote points to how linking communities through standards is not without its complications for local work practices, as this practice has to calibrated in relation to a common framework.

The following dissertation takes its point of departure in the *problematique* that standardization of clinical information in an EPR is done to create new insights with regard to the quality of the local care practices, but is also experienced as additional work and as outsiders' attempt to control the local practices. I am interested in how standardization is achieved practically and in the effects of it on GP work. The research questions that guide the following are: *How does an electronic patient record (EPR) transform daily work in GP practices? How does EPR-use connect local general practices with actors located outside the practices? What are the consequences of the use of an EPR for the relation between GP and patients?*

Standardization, classification and the patient record

The first notes for this dissertation were made at an oval conference table at the Danish Board of Technology (DBT).[2] As a student of anthropology, I participated in a project about the intensification of information and communication technologies (ICT) among general practitioners in Denmark. As an observer, I joined meetings and conferences, listened to discussions and talked to the project participants about current practices and ambitions in relation to computerizing GPs' work. It was during one of the first meetings in the expert group that I became aware of the topic of codes and classifications. Let me briefly introduce the topic that was to be pivotal for my research.

For as long as patient records have been in use within medical practice, issues of standardisation and classification have been pivotal concerns. Around 1900 registration of medical work served as individual physicians' notes about their patients, yet at the same time, and as a major reason for carrying out registrations, records were employed with the purpose of generating scientific knowledge on specific diseases (Berg 2004, chp. 2). This purpose emphasized the need for a universal language that would make it possible to aggregate local information and use it for purposes outside the context in which it was generated. It was at that time the ICD classification scheme (International Classification of Diseases) originated, which is now in use in its tenth version. Bowker and Star's (1999) description of ICD's construction and development points to the way ICD developed from a tool for the classification of morbidity data into an epidemiological tool that was flexible enough to combine a number of purposes and interests (ibid: 72). The wish to use

[2] Danish: Teknologirådet

the patient record to classify information for a number of different purposes simultaneously has increased ever since ICD was introduced. Over the past century, attempts to use the record as a tool to further medical research, as a legal document, and as a management tool has made the need for standardization and common language increasingly persistent. The ICD and attempts to build a Unified Medical Language System (UMLS) that combine all present classifications are examples of attempts to construct a universal language that will 'free' locally generated information from the context in which it was created (ibid: 68).

The advent of information and communication technologies (ICTs) for health care has boosted the visions of transforming locally produced information into movable and comparable bits. ICT fortifies the leading thought that the incomparability of local practices is a major problem, and promotes the EPR (and the diagnostic codes in particular) as magic bullets to a lack of standardization in medical records. The way an EPR is envisioned to further standardization is by offering to health care workers a limited number of ways of describing a symptom or a disease through an alphanumerical combination. Expecting that coding will work as a safe way of standardizing information demonstrates that the work of making things and practices comparable has been highly underestimated. Even though the classification scheme provides a frame of reference for the clinical information, this frame is both too specific and not specific enough for making data useful for different purposes. Besides, as Bowker and Star points out data entry is in itself a complicated process:

> "No matter how good the scheme is, its scope is limited by the fact that data entry is never an easy task, and there are never enough resources or trained personnel to make it happen. Not only will there inevitably be mistakes with respect to the internal structure of whatever classification one is representing, there will also inevitably be cultural variations with respect to how it is interpreted as well as culturally biased omissions." (Bowker and Star 1999: 107)

In the heyday of evidence-based medicine, *not* being able to order clinical information according to classifications and compare the effect of, for instance, medical decisions, has developed into a major issue for discussion. Moreover, it has become one of the main 'sales arguments' for classifying information according to diagnostic codes in an EPR. As mentioned above, classification of clinical information has been done long before the introduction of EPRs. With

EPRs, it is argued, information can be classified into conceptual hierarchies in ways that are more precise and larger amounts of information can be processed (Pearson et al. 1996, van Bemmel 1997, Lawrenson 1999). In broad terms, the division of labour between the EPR and the diagnostic codes is thus that the code offers a framework that makes the standardization of clinical information possible. Adding a diagnostic code to clinical information is thus a way of standardizing clinical information to allow for new overviews of the information contained in the patient record. In addition, coded data, at least in principle, forms a window into general practice operations, as how the GPs treat patients can be laid down and evaluated in formal terms.

Coding as a reason for conflict and cooperation

During the project meetings many different topics were discussed in relation to GP computing, e.g. the issue to risk violating patient privacy by sharing electronic data. In spite of the fact that many of the topics were hot topics from a political point of view, only the codes seemed to simultaneously create an undercurrent of potential conflict and attract the undivided attention and interest of all participants. For an outsider it was difficult to grasp the ambivalence surrounding the codes, and my first reaction as an observer was to downplay this ambiguity and focus on the code as a reason for *conflict*. Therefore, at first I considered the discussions during project meetings as attempts to 'win over' the GPs and make them think coding would be beneficial to them. As coding would open the practice for third party scrutiny coding would be a way for outsiders to better control activity within the semi-autonomous practices.

To understand why the code would generate, if not open conflict then at least a lot of disagreement, I tried to *order* the reality I was witnessing. I began to view the project participants as belonging to two opposing groups with different interests. On the one hand, there were the GPs and project participants with a substantial practical knowledge of clinical work. On the other hand, there were the health care managers and the politicians, who were administering the primary sector. The first group, it seemed, would resist codes because it made them spend more time on registration work than on 'real' clinical work, while the second group would be in favour of GPs using codes more. This group, it seemed, wanted a tool that would allow them to evaluate GPs' practice performances and measure the quality of their work.

Viewing the project participants as belonging to these two categories enabled me to go beyond the messy picture of ambivalence in relation to the coding question and split the participants into neatly organized categories of stakeholders with different interests in computerization and standardization. As I moved out of the conference room at the DBT and started doing fieldwork in

GP clinics, however, it became clear that this image left much to be desired as explanatory model. How could GPs fiercely argue that using codes would diminish their autonomy and make them open for third party scrutiny, and *at the same time* see coding as a useful way of organizing information in their EPRs? Obviously, there was something else at stake here than a classical conflict between 'employers' (health care managers) and 'employees' (the GPs). I thus found that studying their approaches to the coding issue as a difference in *perspective* would overlook the sometimes contradicting ways in which those groups would practically relate to codes and coding. It would thus overlook the way in which both the coding and the configuration of the groups would change through the practice of coding.

I started to wonder about what codes and standardisation of clinical information would do to GP work and new questions focusing on the *relations* between technology and work practice took shape. Why would simple classification create so much tension and ambivalence? Would ordering patient information according to diagnostic codes really affect the GPs' work substantially? Would GPs get less time for their patients? Would it make comparisons between practices possible, and if so, who would carry out such comparisons? Would an EPR turn the GP into something else: a dumb machine operator or some kind of researcher?

The relevance of the study

A focus on patient records and recoding practices may seem too narrow or even unwarranted today, where EPRs for GP work have been in use for more than a decade and plenty of studies have been carried out to describe their effects (de Maesener 1995, Moorman et al. 1999, van der Kam et al. 2000, Anderson 2000, Hassey 2001). High on political agendas all over Europe has been, for some time now, care providers' inabilities to provide care of a sufficient quality. Even though during recent years the EPR has received less attention compared to a few years back, its position as indispensable for optimising the quality of health care remains unchallenged. EPRs are part of attempts to improve medical work whether this happens through implementing performance indicators, guidelines, decision support, or audit.

Moreover, a number of studies on record keeping have shown that records are ubiquitous tools for the organization of health care work (Wagner 1993, Berg 1996, Berg and Bowker 1997, Kay and Purves 1996, Clarke et al. 2003, Rooksby and Kay 2003). Counter to what one may think these studies show that records are not neutral tools that simply 'support' medical work. Instead, they are active participants that make the cooperative work of managing patients' trajectories possible. As records are deeply intertwined with organizational work, changing the record's

structure and the routines around the record has an effect on the way health care is given. However, these studies have also demonstrated that changing the record, for example through computerization, does not in itself make health care work more efficient or rational (Berg 1997).

Next to the studies of paper records, a number of sociologically informed studies have demonstrated how electronic records change health care work and vice versa (Berg 1998, 1999, 2003, Berg and Goorman 1999, Goorman and Berg 2000, Svenningsen 2003, Ellingsen and Monteiro 2003a, 2003b, 2003c). Berg for example points to how an EPR in a more fundamental way than a paper-record mediates and transforms work activities at their root. An EPR is both a 'reading' and a 'writing' artefact, which means that it accumulates inscriptions that inform the work practice of people located elsewhere. Thereby an EPR coordinates work tasks that are distributed and located in many different settings (1999).

The following analyses of how GPs use EPRs are inspired by the above insights about records as constitutive of and constituted by clinical work. At the same time the analyses go further in exploring how an EPR is actively involved in creating new relations between a GP practice and its surroundings and in changing existing relationships. By showing how an EPR participates in many different work tasks the dissertation attempts to 'unpack' the EPR. Instead of viewing it as *one* technology, I thus study its many different 'technologies'. The following analyses describe how an EPR is both a categorization tool, an accountability tool, a tool for information-sharing, and a communication tool simultaneously acting as the GP's memory, as a file for research data, as a tool for demonstrating quality in care, as a tool for inter-organizational communication, as a legal document, and as an administration tool. My aim is to discuss the consequences of using such a multifarious tool for the GPs' work routines and the relation to the patients.

In the following, an EPR will be looked upon as a technology working on the boundary between a clinic and its surroundings. Both being skeptical towards the idea that certain, fixed boundaries between a clinic and its surroundings exist, and towards the belief that such boundaries can be removed by standardizing information, the following offers empirically based descriptions of the intended and unintended consequences of using an EPR for GP work. For a moment bracketing assumptions of how an EPR will *improve* the quality of care by turning information about GP work into comparable data accessible for health care managers, researchers, insurance companies and patients, the following analyses point to some of the dilemmas, challenges and trade-offs that arise from making new clinical overviews and making GP work available to others.

Theoretical orientations

Information scientists S. L. Star and J. Griesemer (1989) have developed a conceptual tool - the boundary object – that may be useful for thinking about how EPRs transform the boundaries between a GP clinic and its surroundings. Star and Griesemer developed the concept to describe how coherence in opinion and action occurs across intersecting but highly different social worlds through a common use of objects and representations (ibid: 393). Even though the concept captures almost anything, it is a useful entry point for thinking about how objects that may seem 'apolitical' or 'innocent' align parties with seemingly opposing interests. If we recall the discussions among the participants of the DBT project, we may consider the diagnostic code as a boundary object. As a discussion topic it not only evoked heated discussions about the acceptable degree of health authorities' control over GP work; it also made everybody agree that increased standardisation of clinical information was appropriate and that the code was an apt tool for this. Thereby the code gave the participants the opportunity to join forces and work towards a political statement in favour of increased computerization of primary care.

I mention the boundary object here to introduce the idea that things, objects or technologies may sometimes work across institutional or other boundaries that seem impossible to transgress; they become agents in their own right.[3] When a technological standard like the code conjoins seemingly opposite ambitions (increased control and better possibilities of measuring performance with ambitions of professional autonomy and self-management) it is not only human determination or ambivalence or resistance that make the code work or not work. The technology itself is active in transforming initial goals and in outlining new possibilities of action.

Looking at the technology as an agent, can be seen as an instance of technological determinism, which is the belief that technologies 'act on their own' ensuring technological progress, and that this, in turn, effects societal change. Framing technology as the driving force for social change may be an experience that everybody has from time to time and there is no doubt that technology affects people's lives profoundly. Technological determinism, however, is not a useful starting point for analysing the consequences of technology use, one reason being that, as analytical stance, it is entirely unable to account for human intervention (Bijker and Law 1992, Wyatt 1998). As S. Wyatt puts it: 'Technological determinism allows no room at all for what is usually a very

[3] Zuiderent provides an example from his fieldwork, in which a care centre that was considered peripheral to the larger hospital suddenly got a separate room when a PC was allocated to the care centre. "Though the head nurse was trying to factualise the care centre as integrated [with the hospital], the alliance of the PC and the box provided the irrefutable argumentation for obtaining a separate place designated to the [Care Centre]." (Zuiderent 2002:66)

messy process of change, involving not only technical artefacts but also a range of broadly social factors, including struggles over political, economic and cultural control within and between countries, organizations and households' (Wyatt 1998:13).

What is needed is an analytical framework that is able to account for human as well as for technological agency. Scholars inspired by the philosophy of science have offered one such approach referred to as actor-network theory or ANT. As an analytical approach to science and technology (or techno-science), ANT's particularity lies in its radical use of the concept of the network, which is inspired by semiotics. ANT's conception of the network differs from other network theories in the sense that all nodes in the network are seen as *actors* and all connections are seen as *translations* (Elgaard Jensen, 2003). One of the basic assumptions within ANT is that a subject/object is defined by its position in the network; the identity of an actor is thus radically relational; no object has an essence or a 'core' identity.

According to ANT technology should not be considered the one and only driving force for societal change, yet, it is argued, technology deserves more attention in particularly sociological analysis. The scholars who developed ANT describe how technology has largely been left out of studies that deal with 'the social'. In the history of social theory, they argue, there has been a distinction between 'social relations' or 'social structure' on the one hand and the 'merely technical' on the other (Law 1991:8). Their objection to this divide is that the technical and the social constitute each other; one cannot be understood without the other. As J. Law puts it: "To the extent that 'society' is held together at all, *this is achieved by heterogeneous means* (…) the social is not purely social at all' (ibid:7).

This perceived lack of attention towards technological phenomena, and the inability to account for how most phenomena are simultaneously social and technical is problematic because it 'purifies' phenomena that according to actor-network theorists do not belong to *either* a technical *or* a social domain. ANT has been used to study a wealth of phenomena as actor-networks; bacteria (Latour 1983), drug users (Gomart 2002), inhalers (Willems 1998), scallops (Callon 1986) and many others. The approach is also useful in relation to a study of EPRs and GP work, as an approach that would only take 'social' aspects and actors into account would be unable to account for codes, screens, bits and bytes, whereas a purely 'technical' approach would miss out on how an EPR reorganizes the clinical work in subtle, yet profound ways.

From an actor-network perspective, sociotechnical phenomena or hybrids as actor-network theorists call them are anywhere. As B. Latour has argued, hybrids crisscross the realms of nature,

society and politics; they are simultaneously 'real, like nature, narrated like discourse and collective, like society' (Latour 1993:6). To study those phenomena, alongside the analytical approach that brings sociotechnical phenomena into focus, ANT offers a methodological departure point (in fact these two are hard to separate, as within ANT there are no such things as meta-theory or distinct methods). One of the basics in this methodology, on which I have drawn in the following, is that there is no possibility of making a priori definitions of actors' characteristics. Before starting data gathering and analysis, there is thus no possibility of deciding what an actor does or what 'role' it fulfils. As the characteristics of any actor depend of its position in a network (Callon and Law 1995), researchers need to study the connections between actors empirically. In the following, I will take ANT's 'atheism' as to what is cause and effect, social or technical, micro or macro, inside or outside as my entry point to the study of the EPR.

To sum up, the notion of the boundary object is a useful starting point for thinking about a technology or a standard as an actor. The diagnostic code was given as an example of how, in the DBT project, the codes 'did' something to connect people across institutional affiliation. Yet, viewing the code or an EPR as a boundary object does not really challenge the view of actors as inherently 'social' or 'technical'. Thus the limitation of the boundary object terminology is that - despite the excellent point that objects can act as agents - it does not talk about the subtle transformations that happen when actors interact in different settings. As I wish to be able to describe how the social and technical intersect and thoroughly transform each other I looked for an analytical departure point that would not a priori assume the existence of certain entities. The following analyses each examines different parts of an EPR attempting not to take for granted what they do, where they work, who their users are or what practices they connect or disintegrate. The study is inherently exploratory and inductive, which is why the following focuses on different 'technologies within the technology' (diagnostic codes, the screen, audit reports, discharge letter) as well as on different 'users' of those technologies (GPs, health authorities, patients, secretaries, hospitals, and researchers) and discusses how those actors are mutually transformed.

Research methods

As the research questions centre on practical, everyday considerations and activities ethnographic insights have informed the data generation strategy. Ethnography's focus lies on the way phenomena are enacted in practice and data are generated for analysis through participation of and observation in a given practice. Anthropologists refer to this way of collecting data as *participant observation*. This oxymoron refers to researchers' role as 'double agents' at the same time

observing and participating in the practice under study. The assumption is that this is a method for familiarizing oneself with the otherwise unfamiliar study site. The researcher thus aims at experiencing the practice 'through the eyes of the participants'. Simultaneously, however, all positions are at any time 'permanently mortal' (Haraway 1991:201), and their constant reconfigurations are objects for analysis (Hastrup 1995, Hasse 2000).

I participated in everyday activities by participating in the DBT working group, by working as a receptionist in a GP clinic for a while, and by sitting next to GPs during surgery. Most of the data, however, stemmed from observations during surgery and from interviews with GPs and other staff. During the 4-year period of the project, I visited about 20 practices, conducted fieldwork in six of them and interviewed more than 30 GPs (a number of them several times) in addition to the interviews with practice nurses, receptionists, and practice managers. The clinics were located in the UK, Denmark and the Netherlands.

Semi-structured interviews usually forms part of ethnographic research, and are carried out to generate complementary accounts of the practice observed. Within ethnography and social anthropology, interviews have often been considered 'second best' compared to direct observation, but increasingly the status of the interview is elevated and pointed to as unique site for knowledge construction (Kvale 1999, Hastrup 2003). In my study, interviews were an important site for gaining insight into the GPs' work, as there was seldom time to ask clarifying questions during the intensive consultation hours.

Using ethnographic methods means that writing up the research results has a different function than merely reporting the results by the end of a study. As writing is an intricate part of generating empirical material through the making of field notes, analysing data and writing up the results is not something that takes place *after* data generation has been completed (Sanjek 1990). As ethnographers do not consider field notes as accurate representations of reality 'as it really is', (see Clifford and Markus 1986) field notes help the researcher re-adjust the study design along the way, as analysis takes place during data-generation. Field notes are made valid through explicit reference to analytical and theoretical assumptions; their validity is not based on how precisely they represent the observed actors' point of view. Within ethnography 'accurate description' can thus be replaced with 'adequate description'. This refers to how well the researcher makes probably the link between field notes and transcripts and analytical and theoretical resources. Description, therefore, is the tool that enables the researcher to construct data for analysis, not the end-result of a well-developed and well-tested research design.

Sociologist H. Becker talks about how writing implies putting oneself at risk, as writing transforms the writer's viewpoints (Becker 1986:119). Writing makes the site under study available for the researcher; as communication between the field site and the researcher is made possible through writing. Moreover, writing enables researchers to communicate with a scientific audience. Choosing this format of the dissertation, a collection of published and submitted articles, has been also been a choice of writing for a number of different audiences within fields as diverse as Medical Informatics, Information Systems Research and Science and Technology Studies. Just as standards are employed with the aim of connecting different communities and practices within health care, the research article has been employed as a 'standard' with the purpose of connecting different communities to the issue of standardization, EPRs and GP work. As some of the articles have been published, others not yet published and others are rewritten versions of published or submitted articles, I refer to the articles as *analyses*. The analyses are placed as appendixes after the conclusion and the Dutch summary.

Presentation of the analyses

Analysis 1, co-authored with C. B. Jensen and published in *Information Technology and People* (Jensen and Winthereik 2002), analyses how reports and recommendations work as translation devices between different perspectives of how health care ICT should be implemented into health care practice. The paper employs the notions of political and moralising moments as a way of accounting for how visions on the effect of ICT become powerful agents in health care.

Analysis 2 is a re-written version of an article published in the journal *Methods of Information of Medicine* (Winthereik 2003) and a chapter in Svenningsen and Vinge (forthcoming). It describes how GPs in the UK, Denmark and the Netherlands add diagnostic codes to clinical information in an EPR and discusses different kinds of dilemmas experienced by the GPs in relation to coding. Based on this, the analysis argues that the use of codes does not in itself guarantee a true representation of GPs' performance or of the quality of care in the clinic; instead, work must be done to make the coded data useful in more contexts simultaneously.

Analysis 3 has been submitted to the journal *Science, Technology and Human Values* (Winthereik et al., submitted). This analysis focuses on how GPs use standardised information for demonstrating accountability, and discusses the relationship between increased demands for transparency and GPs' professional and clinical autonomy. The analysis argues that electronic accountability tools position GPs in new kinds of relationships with actors outside their practice.

The analysis concludes that accountability and autonomy are not opposites, as using an EPR for demonstrating accountability opens new spaces for autonomous action.

Analysis 4 is published in the journal *Scandinavian Journal of Information Systems* (Winthereik et al. 2002). It discusses how ethnography can be used to understand the (intended and unintended) effects of EPR-use in practice. In the analysis it is argued that turning GP-EPR interaction into a research object through ethnography is useful. Not because it gives access to a truer version of reality than other methods that do not focus on everyday practice, but because it forces the researcher to constantly adjust the research design and his/her position at the research site. In addition, the paper points to how possibilities of sharing data by means of an EPR, makes GPs seriously consider how to also to *avoid* sharing data with patients and others.

Analysis 5 is co-authored with S. Svenningsen and has been submitted to *the International Journal of Computer Supported Coorperative Work* (CSCW) (Winthereik and Svenningsen, submitted). This analysis also deals with the issue of data-sharing but this time in relation to communication between GPs and hospitals. The analysis describes how discharge letters are produced and used and examines how they are transformed in the process. The analysis argues that ambitions to realise integrated health care through standardizing clinical documents carry with them two kinds of challenges. First, the challenge of avoiding a too polished account of complex patient cases, and second, the challenge of avoiding that standardised information results in extra work for care providers 'down the line'. The analysis argues that besides *bridging* health care organisations at some places, standardized data sharing simultaneously stimulates practices that single out *separate* areas of responsibility.

Analysis 6 is a re-written version of an article that has been submitted to a special issue of *Information, Communication and Society* on e-health (Winthereik, submitted). It returns to the work it takes for the GP to share information with patients during consultations. The analysis gives examples of GPs working with an 'open' and with a 'closed' screen. It shows how GPs do much to control the effect of the screen on the communication with patients and points to the relevance of understanding existing ways in which the screen participates in the communication in the light of attempts to introduce tools for shared decision-support.

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Conclusion

"The only way to find a larger vision is to be somewhere in particular." (Haraway 1991)

Introduction

When studying information systems there are at least two approaches to the task at hand. One approach would be to study how a given system fulfils it requirements. One would take one's point of departure in what the system ought to be doing and relate the way the system works to its functional requirements. Another approach would be to study how a system works in an organization. One would take one's point of departure in what the system in fact does, not in the functional requirements. The two studies would probably present quite different versions of the system. The first would offer a rather detailed description of the system's functionalities and an analysis of how well the system carries out its tasks. The second would offer a description of the system pieced together by analyses of the system's performance in use and see the system in relation to its social and organizational context.

This dissertation has focused on an information system, the EPR, from the kind of perspective mentioned last. At the centre of the study has been the system, not as a separate entity, but as an intricate part of local work arrangements and organizations. Concluding this study of the use of an EPR in primary care work and of the consequences of this, what did I find?

First of all, I found that EPR-use is not an activity that is easy to delimit, as it refers to a variety of practices and activities. By definition, an EPR is a database containing patient's information (Berg 2003a: 7), in a primary care context it is thus the GPs' notes about their patients. Seen in a larger organizational context data in an EPR, however, may be used by GPs, receptionists, specialists, internists, pharmacist and many others located outside the clinic. 'Use' thus involves different activities featuring the EPR as well as different actors next to the GP and the consequences of an EPR for primary care work therefore affects a number of actors next to the GP.

Studying the different uses of an EPR empirically allowed me not to take for granted what an EPR was, how it was used, and who would use it. The ethnographic approach employed enabled me to describe an EPR as a tool fulfils a number of roles. I studied the EPRs 'at work' in the sense that it was not seen as an abstraction or as a system that was supposed to work in any ideal way. Rooting the analyses in observations of GPs' daily dealings with their IT-systems enabled me to adjust my study design and the questions I found relevant along the way.

To acquire an analytical 'handle' on the empirical descriptions I chose to view the EPR and its constituent parts as actors. In the dissertation EPRs are described as objects, whose materiality thoroughly transforms the way GPs carry out their work. EPRs are not conceptualized as 'things' the way we usually think of things, i.e. as 'dead' objects with no agency. Instead, they are conceptualized as actors, whose participation in the clinical work facilitates thorough reorganizations of the work. In my attempt to study how, precisely, EPRs participate in GPs' work I was inspired by studies of science and technology, which regard objects as obtaining agency through their relation to other human or nonhuman actors (Gomart 2002, Latour 1987, 1999). The dissertation also draws on recent studies of EPRs at work in medical settings. Many of these studies also focus on technology as an actor by empirically describing what EPRs 'do', how they shape ongoing medical work and are shaped in turn (Berg 1996, 1997, Svenningsen 2002,).

Overall the dissertation offers descriptions of the EPR as a multifarious technology used for categorizing clinical information, for monitoring patients, for accounting for one's actions, for on-the-spot sharing of data with patients and for establishing new forms of communication with other care providers such as hospitals. This, along with the dissertation's form and structure (a number of articles submitted for publication while the dissertation was still progressing) makes it hard to capture its findings in one circumscribed, well-defined conclusion. Moreover, as I have chosen to focus on the EPR as consisting of several 'technologies' (diagnostic codes, discharge letters, the screen etc.) it is hardly possible to make the argument that an EPR *as such* affects GP work in any unequivocal way. Instead each chapter has its own conclusion pointing to some of the consequences of the 'technology' discussed in that specific chapter.

Nevertheless, there is one general tendency arising from using EPRs: Formalizing the patient record through means of codes reinforces the record's dual purpose as both a tool for supporting the clinical process and for documenting this process (Dourish 2001). GPs and GP practices are therefore increasingly connected to other actors on the health care scene. As exchange of structured data is possible and happens in a way that was never possible with a paper-based record, GPs can be held accountable for their actions in new ways.

Forms of accountability

In a recent article S. Eriksén (2002) discusses the notion of accountability by looking at three different instances of the concept. The aim is to be able to distinguish between different

understandings of accountability when used in relation to information systems design.[4] The first form of accountability she traces back to classical ethnomethodology and to H. Garfinkel's work. This is accountability in the meaning of 'show and tell'. According to this form representing one's actions through showing and telling is part of the way in which humans demonstrate membership of a community. Being account-able is thus an intricate part of all human action and there are no political implications of this form of accountability.

The second sense of accountability Eriksén explains by referring to L. Suchman's term 'located accountability'. Located accountability means to take personal responsibility for one's own actions beyond one's immediate memberships (Eriksén 2002: 182). In contrast to the first meaning this version of the concept has strong political implications, as it points to accountability as both a collective achievement and dependent on how people are positioned in relation to each other (as designers, users, managers etc.).

The third, and last, meaning of accountability is defined as 'consistency in the story a system tells about itself' (ibid.: 182). This definition is technology-centered in the sense that it sees accountability as making a practice transparent through acts of formalization. Accountability is achieved whenever there is a match between users' perspective and the systems' representation of the user perspective. To demonstrate accountability data must be precise, and data is only precise if they refer to users' perspectives. This form of accountability is not explicitly political; yet, it may be argued that politics are built into to the system as it may represent users differently.

In practice, different forms of accountability are weaved together and used as arguments for why IT should be integrated further into health care work. The same feature may be seen as bringing different forms of accountability about. Diagnostic coding, for example, may be seen as a form of 'show and tell' that holds no political implications. At the same time it may be seen as a piece of work, which the GP takes upon him or her for 'the common good' and which produces located accountability. The GP is locally positioned and has access to information that, when standardized, may be used for the general purpose of creating new insights. Finally, coding may be seen as an instance of 'accountable' systems design, as it is the information system's ability to structure and precisely represent the entered information that produces accountability.

Those different forms of accountability are brought up in normative discussions of EPRs and are each linked to visions of better health care. Each of them have moral and political implications; each of them sees accountability as 'good' in different ways and poses different

[4] For a more detailed presentation of the three articles mentioned see Eriksen 2002 and the articles themselves (Garfinkel 1984/1967, Suchman 1994, 2002, Dourish 1995, Button and Dourish 1996).

answers to the question *accountability for whom?* In the following I will look closer at some of the dynamics that produces accountability in the GP practice and point to what I see as one of the implications of a persistent wish to create accountable practices.

Accountability networks and centres of calculation

Accounting for what one does by making precise representations of one's work is no straightforward task (Brown 2001). In the GP clinic there are no unequivocal 'referent' against which a GP can compare his or her representation of the work. Next to diagnostic coding, clinical guidelines have been developed, first, to help GPs root their work in clinical evidence and second, to make the subsequent registration more accurate. To demonstrate accountability good registration practices are surely needed. But more than that, technologies are needed that draw information together by summing up individual GPs' registrations.

Drawing information together is a powerful way of representing individual practices. Latour has developed the notion of a *centre of calculation,* which is a notion that captures the idea that distinct pieces of information can be gathered and connections between the pieces of information established so that facts based on the information may be constructed (Latour 1990:59, 1999: 304). The databases, where information from local medical practices is gathered, may be seen as centres of calculation (see e.g. Mainz 2003). Databases that are established to be able to make statistics on locally generated information are used as a management tool and as a mean to be able to feed the information back to the local practices.[5] The intention is to create a mirror for the practitioners, which may be used for self-monitoring purposes as well as for external monitoring.

This way of creating a transparent GP practice and an accountable GP depends on the production of standardized data as well as on whether a network is in place that allows the data to travel between the GP practice and a centre of calculation. In a recent anthology M. Strathern coins the term audit culture (Strathern 2000). Strathern and the authors of the various chapters of the book show how an audit culture relies on standard instruments and procedures (ibid: 67).

Fully controlling the quality of local work through audit is neither practically possible nor economically feasible. Therefore monitoring and self-monitoring become two sides of the same coin and local centres of calculation are established in the sense that GPs run tentative audit reports, again for self-management purposes. One of the consequences of summing up data locally is that it

[5] Latour notes that: "The calculations themselves are less important than the way they are arrayed in cascades" and argues that "the last inscription" is always believed more than anything else (Latour 1990: 59). In a GP setting "the last inscription" is the report sent back to the GP setting, which definitely carries a lot of authority.

enables practitioners to maintain a space of discretion; they are better able to control the content of the audit reports they produce. Data shipped off 'packaged' obviously are more controllable than data sent off 'unpackaged', as the latter may give rise to unwarranted evaluations. Making one's own audit reports is a way of keeping track with one's own performance during the process, as audit reports can be run whenever one wants to and, in the case of the GP clinic, its results be discussed over lunch. Tentative reports may thus work to create moments of reflection among the practitioners, who produced them.

Introducing such moments of reflection is precisely what health authorities would like locally generated audit reports to do, as such moments enable GPs to adjust their work to best practice guidelines. However, from a theoretical point of view self-monitoring may be seen as a way of 'cutting the network' (Strathern 1996) that enabled information to 'travel' between the GP practices and external centres of calculation. The flow between the individual GP and a center of calculation is temporarily broken off, even transformed, as faulty decisions or bad results may be corrected along the way. Interestingly, "cutting the network" does not make the GPs appear less able to perform accountability as self-monitoring and self-management are considered high-end forms of accountability.

To sum up, I argue that one of the consequences of using EPRs in general practice is GPs are increasingly being connected to outside actors such as health authorities and to other GP practices with whom performances are compared through centres of calculation. At the same time self-monitoring is made possible through local centres of calculation. To produce accountability and demonstrate quality of care GPs thus need to quantify their work. This, of course enables them to ground their decisions in the quantifications and speak with more authority about practice matters in relation to external bodies. At the same time quantification becomes imperative for any decision made in the clinic and consequently decisions that cannot be grounded in quantification carry little or no authority (see also Porter 1995).

Theoretical and methodological implications

Above I have argued that the EPR is an assembly of technologies coordinated around coding and the practice of demonstrating accountability. In my analyses I have aimed at describing other, sometimes mundane, aspects of the technology. In keeping with writings about IT as neither 'purely' social nor 'purely' technical (Berg 1999) I have been inspired by approaches that look at IT as socio-technical systems. Such approaches focus on how IT works and explains why it works or does not work by also looking at the organizational context (see e.g. Button and Harper 1993, Heath

and Luff 2000). Scholars studying information systems from a socio-technical approach have often focused on how to make 'better' systems. They have raised the question of how to inform and improve systems so that they that can most fruitfully be put to work in health care or elsewhere (Berg 2003b).[6]

This issue of how to make better systems is an issue that I have not dealt with in my work. Instead, the normativity in my work (and in much work taking an STS-approach to the field of study) has been to 'unpack' the EPR. The questions that interested me, more than coming up with ideas for better design, were: how can EPRs be viewed as material actors? What are the implications of viewing them as such?

I do not mean to suggest that by choosing STS I picked an approach with no normative implications. There are no such approaches. But it means that STS is not 'practical' in the sense that my findings can be directly translated into suggestions for design. In that sense STS and more specifically, ANT, which are the approaches that have shaped my perspective on the reality I studied, are 'impractical'; they mainly focus on demonstrating complexity and on show how particular knowledges have bearings on specific organizational arrangements.

The normativity I have pursued in this dissertation has been to question taken-for-granted objects and view them as multiple and as dependent on specific organizational arrangements. The aim has been to hold up mirrors for the people engaged in the studied practices that allow them to be surprised. Mirrors, here, refer to multiple representations of a practice, so a hall of mirrors may be a better metaphor for describing the normativity of this study. In entertainment parks the hall of mirrors transform well-known images in a funny and sometimes distorted way. Above I have mirrored my object of study, the EPR. This is a well-defined entity for practitioners and politicians, because the work of coding that coordinates the different EPR technologies is largely invisible. For practitioners some of my conclusions may be read as surprising images that enable them to see their practices and their EPRs in different ways. The resulting accounts, however, do not enable me to produce suggestions about why some IT-systems are successful and why some fail, or about how care can be performed in a better way than hitherto.

I have 'unpacked' the EPR, thus transforming a taken for granted entity into a multiple object (Mol 2002a, 2002b). This study offers proposes a sustained attention for the different methods that enable researchers to produce accounts that are both recognizable and surprising. The dissertation has examined the work it takes – for codes and for the GPs - to make the EPR work.

[6] See Bruun Jensen (2004) for a critique of this instance of what he calls 'a politics of concretisation'.

For further study it is needed to follow coded data generated in GP practices when they are used outside this practice, e.g. in evidence-based studies. How is evidence-based medicine performed as research practice through coded data? What is the role of codes and GP work in evidence-based medicine? How is evidence-based medicine performed as a singular object and what would it mean to analyze its multiplicity?

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Nederlandse samenvatting

Huisartsen maken steeds meer gebruik van informatietechnologie. Dit doen ze niet alleen voor administratieve doeleinden, maar ook tijdens de spreekuren met patiënten. Dit onderzoek gaat over elektronische patiënten dossiers (EPDs) en over de verschillende manieren waarop huisartsen die gebruiken. Met het gebruik van EPDs krijgen de gegevens van patiënten een nieuwe structuur. Ook kunnen EPDs huisartsen er elektronisch aan herinneren dat ze bepaalde tests moeten doen en of kunnen EPDs gebruikt worden om met andere hulpverleners over patiënten te communiceren. Bovendien wordt huisartsen steeds vaker gevraagd diagnostische codes toe te kennen aan klinische informatie, zodat die informatie ook buiten de huisartspraktijk kan worden gebruikt. Deze zogeheten secundaire doelen van het EPD zijn bijvoorbeeld onderzoek, audit/ verantwoording en evaluatie.

Doel van deze studie is inzicht te krijgen in de transformaties die het gebruik van het EPD teweegbrengt in het dagelijks werk van de huisarts. Ik beschrijf daartoe het EPD als *actor* in de huisartspraktijk. De onderzoeksvragen luiden dan als volgt:

- Hoe transformeert het gebruik van het EPD het dagelijks werk van huisartsen?
- Hoe verbindt het EPD huisartspraktijken met actoren daarbuiten?
- Wat zijn de gevolgen van het gebruik van het EPD voor de relatie tussen huisarts en patiënt?

Voor het empirische deel van dit onderzoek is gebruik gemaakt van etnografische methoden (observaties en interviews). Ik beschrijf hoe het EPD in de huisartspraktijk wordt gebruikt. Specifiek heb ik het werk onderzocht dat huisartsen moeten verzetten om gegevens te standaardiseren door het gebruik van diagnostische codes en de consequenties die dat heeft voor de huisartsenzorg.

Theoretisch is deze studie op twee plekken te lokaliseren. Allereerst in Information Systems Research, waar de implementatie en het gebruik van informatietechnologie in organisaties wordt onderzocht en geëvalueerd. Het tweede onderzoeksveld is dat van Wetenschaps- en Techniek studies (STS). Hier onderzoekt men de invloed van technologie op de samenleving. Een gedeeld

inzicht in beide onderzoekstradities is dat technologie de realiteit waarin die is ingebed diepgaand beïnvloedt, zonder die realiteit geheel te bepalen. Hoewel ik dankbaar put uit beide onderzoekstradities, ontleen ik mijn werkwijze en concepten aan Wetenschaps- en Techniek Studies, of preciezer: Actor Network Theory (ANT). Specifiek gebruik ik het binnen ANT ontwikkelde concept *translatie* (translation). Dit concept blijkt buitengewoon vruchtbaar om te beschrijven hoe het werk van de huisarts op subtiele manieren transformeert als gevolg van het gebruik van het EPD.

In dit proefschrift neem ik in zes analyses verschillende aspecten van het gebruik van het EPD onder de loep.

De eerste analyse gaat over visies op informatietechnologie in het algemeen en op het EPD in het bijzonder. De analyse demonstreert hoe rapporten en aanbevelingen verschillende normatieve visies over hoe het EPD geïmplementeerd moet worden tot elkaar weten te herleiden. De concepten 'politiserende'en 'moraliserende momenten' blijken nuttige instrumenten om te analyseren hoe bepaalde visies van invloed worden in de gezondheidszorg ten koste van andere.

De tweede analyse bespreekt de implicaties van het diagnostisch coderen in de huisartspraktijk. Ik laat zien hoe huisartsen in het Verenigd Koninkrijk, Denemarken en Nederland diagnostische codes toekennen aan klinische informatie in het EPD. Dit coderen stelt de huisartsen voor problemen. Uit de analyse van die problemen blijkt dat coderen niet automatisch een representatief beeld geeft van het werk van de huisarts of de kwaliteit van zorg in de huisartspraktijk. In de analyse maak ik zichtbaar dat coderen vraagt om *werk* van de huisarts om de gecodeerde gegevens in verschillende contexten tegelijk te kunnen gebruiken.

De derde analyse gaat over 'audit' of verantwoording van zorg versus autonomie van de huisarts. Ik laat zien hoe huisartsen zich verantwoorden met behulp van gestandaardiseerde informatie. Daarmee problematiseer ik de tegenstelling tussen de steeds luider klinkende eis van transparantie en de professionele autonomie van de huisarts. Audit, herinneringen en waarschuwingen veranderen de relaties tussen huisarts en anderen buiten de huisartspraktijk wel, maar dit leidt niet tot opposities tussen verantwoording en autonomie. Ik betoog dat het gebruik van het EPD om verantwoording af te leggen voor de huisarts nieuwe vormen van autonomie creëert.

In de vierde analyse staat de etnografie centraal als methode om de bedoelde en onbedoelde effecten van het gebruik van het EPD te bestuderen. Door interacties tussen huisarts en EPD object van etnografisch onderzoek te maken wordt de onderzoekster voortdurend gedwongen haar onderzoeksontwerp aan te passen en steeds opnieuw haar positie te bepalen in de praktijk die zij

onderzoekt. Ik illustreer dit aan de hand van de mogelijkheden die het EPD biedt aan de huisarts om gegevens te delen met andere instanties. Het delen van informatie confronteert de huisartsen met het probleem hoe zij moeten omgaan met vertrouwelijke gegevens.

De vijfde analyse gaat ook over het uitwisselen van gegevens, deze keer in de communicatie tussen huisarts en ziekenhuis. Ik analyseer hoe ontslagbrieven worden gemaakt en hoe ze in het proces tussen hun eerste schets en hun uiteindelijk gebruik in de huisartspraktijk transformeren. Ik betoog dat het realiseren van zorg door verschillende instanties die op elkaar zijn afgestemd ('ketenzorg') door het standaardiseren van klinische documenten twee problemen met zich meebrengt. Het eerste probleem is dat complexe casuïstiek ten onrechte wordt vereenvoudigd en gestroomlijnd. Het tweede probleem is dat gestandaardiseerde informatie leidt tot extra werk voor de hulpverleners in de eerste lijn, omdat ze daar andere codes en definities gebruiken. Het uitwisselen van gestandaardiseerde informatie is behalve een manier om organisaties in de gezondheidszorg te *verbinden* ook een manier waarop hulpverleners juist hun verschillende verantwoordelijkheden *afbakenen*.

De zesde analyse gaat over de interacties tussen huisartsen en patiënten rond het computerscherm. Ik laat zien welk werk de huisartsen moeten verzetten om informatie op het computerscherm op een acceptabele manier toegankelijk te maken voor patiënten die op het spreekuur komen. Ik geef voorbeelden van huisartsen die werken met een 'open' en met een 'gesloten' scherm. Ik concludeer dat het begrijpen van manieren waarop het beeldscherm participeert in de communicatie tussen huisarts en patiënt uiterst relevant is voor het begrijpen van problemen die optreden bij de introductie van instrumenten voor beslissingsondersteuning, omdat ook het computerscherm ook dan een grote rol speelt.

Ik concludeer dat er een algemene tendens is in het gebruik van EPD's. Het formaliseren van het patiëntendossier door middel van codes versterkt het dubbele doel van de elektronische dossiers: de ondersteuning van het klinische proces en het documenteren van dit proces. Huisartsen en huisartspraktijken zijn door het gebruik van EPD's in toenemende mate verbonden met andere actoren in het veld van de gezondheidszorg. De uitwisseling van gestructureerde informatie op een manier die ondenkbaar was met een papieren dossier, leidt tot nieuwe manieren waarop huisartsen verantwoording afleggen over hun handelen. Huisartsen moeten hun werk meer en meer vertalen in cijfers om die verantwoording te kunnen afleggen, ook naar zichzelf. Huisartsen baseren hun beslissingen op cijfers om tegenover externe instellingen met autoriteit te kunnen spreken. Tegelijkertijd lijkt kwantificering een steeds belangrijker voorwaarde te worden om beslissingen te

kunnen nemen in de huisartspraktijk. Het gevaar is dat beslissingen die niet kwantitatief verantwoord kunnen worden aan gezag inboeten.

Appendix A

Jensen, C. B. and B. R. Winthereik:

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Political and moralising moments: on visions of IT in Danish health care

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Abstract *In this paper, we discuss the production of visions for IT in Danish health care. Visions are not propagated "from above" but are produced through translation processes, in which contents change as they are inscribed in ministerial reports, leaflets or recommendations. This is illustrated by two cases: the electronic patient record at Hvidovre Hospital (HVEPS) and the Digital Doctor Project (DDP). Following STS-studies we propose to analyse such reports as material agents with distinctive capacities and features. Prominent among those is the ability of such reports to carry "contradictory" messages. We analyse this capacity as a strength as it enables reports to bind together various people in various contexts, rather than as a weakness. We propose the concept of political moment as a tool that can capture the material heterogeneity and the unexpectedness of translations. The concept of moralising moment is introduced to identify accounts in which such processes are glossed or covered.*

Introduction

> Modern information technologies are penetrating all parts of societal life, changing organisations and types of work at an accelerating pace. Skilled use of the new possibilities is becoming more and more decisive for the competitiveness of the companies, and for the ability of the public sector to provide good service of high quality for the citizens at manageable expenses. This development also affects the medical sector to a great extent. Data communication and electronic health care records are going to become increasingly important in daily work life (Danish Minister of Health, Sundhedsministeriet, 1996, preface).

In Denmark, like in many other Western European countries, information technology (IT) coupled with "new" administrative ideas are thus presented as the cure for "sick" health care sectors.

How should one understand such pronouncements? In the following we propose to analyse ministry leaflets and policy recommendations as a kind of "genre" with specific properties. Following STS-studies we view the paper trail of reports not as inert matter propagating visions from "above" but as material agents enrolled in the work of producing, negotiating and stabilising visions of health care (Berg and Timmermans, 2000; Clarke and Olesen, 1999; Latour 1992; Mol, 1998; Timmermans and Berg, 1997).

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We are particularly interested in the moments when arguments seem to get "a life of their own". If arguments sometimes seem to "speak for themselves", we are interested in the materially heterogeneous work that makes this possible. We are interested in the production and stabilisation of argumentative agency, and how it manages to bind together various people in various contexts.

From this point of view, it is impertinent to keep up an analytical split between, for instance, new administrative ideas, such as NPM, new technological systems, such as the electronic patient record, and the local wards that are supposed to take over these ideas and technologies (Bentsen *et al.*, 1999). Instead, we view these entities as composed in a (more or less) seamless web, in which the social, the technical, the material, the symbolic, and the discursive are relationally defined and constituted (Hughes, 1983; Bijker, 1992; Callon and Law, 1995).

The question we deal with in this paper is how to conceptualise politics, if political efficacy is not solely a matter of human activity. How can politics be understood, if what is traditionally seen as the political proper, is only one part of an intertwining of humans, technologies and discourses? Below we develop notions of what we term political and moralising moments as some "tools" that can be used to articulate invisible political processes in the web of health care and ITs.

We exemplify the use of these concepts through two case studies. The first case is the HVEPS project (Hvidovre Hospital Elektronisk Patient Journal System), carried out from early 1994 to 1996, in order to expose so-called "necessary user needs" for an integrated electronic patient record at a major Danish hospital. Our second case is the digital doctor project (DDP), which took off in July 1999. This group, initiated by the Danish Board of Technology, had the explicit aim of imagining enhancements of the future of Danish general practitioners (GP) practices by means of IT. The group was to arrange a workshop and a conference, write a collection of visionary essays, and formulate an "action plan" for government use.

In conclusion, we discuss the possible purchase of adopting a vocabulary of political and moralising moments, in order to specify areas of invisible techno-politics (Star, 1991; Star and Strauss, 1999; Wagner, 1993) inscribed in official evaluations and recommendations.

Political and moralising moments

We deploy the notions of political and moralising moments as an attempt to displace the divides between discourse and practice, social and material or technical and symbolic. Instead, we view politics as criss-crossing these domains. Following Latour, we understand politics as having to do with the negotiation and translation of the goals or interests of networks (Latour, 1994).

Negotiations do not take place between human actors only. Material agents displace the intentions of those that delegate actions to them (Latour, 1988, 1999). Thus, texts are misunderstood, doors jam or parachutes do not open. In

the political domain this problem often remains unthematised. The political work of negotiating with and through material actors often remains invisible.

It is this work we want to make explicit with the notion of political moments. Since political moments span categories technical, linguistic, scientific and political, they are part of what Latour (1993) has called the work of hybridisation. The hybrid character makes it impossible to capture with ready-made modern categories.

Political moments can be understood as events that allow work to go on through unexpected re-definitions or translations of situations. As events, political moments are always unexpected or, in a sense, untimely. They come, Steve Brown suggests (pers. comm), from "outside the existing system of thought". Our endeavour has to do with enabling us to theoretically match the complexity found in practice as events take place.

Often this complexity is glossed or reduced by means of common sense or theory. When this happens we talk of moralising moments. These are part of what Latour has called the work of purification (Latour, 1993), which cut the world (or the network) (Strathern, 1995) up in specific pre-defined ways, and attribute efficacy or agency of particular types according to this distribution.

Moralising moments are often highly visible, even explicitly on display, but are of little use when trying to affect change in real-time action. We claim they are also of little help when trying to theorise technologically mediated social activity. In a Nietzschean phrase they are the reactive counterparts to the proliferating, if invisible, activity of moments (Deleuze, 1983); if reactive, moralising moments are nevertheless practically effective. As the pragmatist's so-called Thomas theorem suggests: if something is believed in, then it is real in its consequences.

An example: distributed accountability

To flesh out these notions a bit more we turn to "History 2.0: performing the past in the context of electronic archives" (Brown and Lightfoot, 1999). They discuss the many organisational uses of e-mail. E-mails prove to be highly political devices, that can be "switched on" through such techniques as copying-in, blind-copying and keeping local archives of mails, in order to be able to "perform the past" in specific ways if accountability is challenged. The possibilities of e-mail redefine organisational accountability: through a specific sort of technical mediation, an un-thematised political moment has occurred.

Brown and Lightfoot's (1999) analysis does not stop there. Rather it goes on to show how this change of accountability is only functional up to a certain organisational level. Accountability has an exteriority:

> What emerges in the course of the extract is that very senior meetings, the places where big decisions are made, are rarely minuted. This is felt to be "absolutely unnecessary". The reasons for this as they are mobilised by the manager in question are interesting. At that level "you are basically colleagues together", which is to say that matters of routine accountability are on a very different footing. One is not expected to have to mobilise extensive evidence to defend one's position (Brown and Lightfoot, 1999).

In Brown and Lightfoot's (1999) story, a network has been built that is strong enough for the senior manager's room to seem to emanate power. The room works as a local blank spot, in which actors are temporarily unaffected by power mutations, since they are not held accountable. Along with the analysis of how e-mail reconstructs organisational politics goes an analysis of how a specific place is constituted where accountability is unnecessary. This is the recovery of another political moment. To capture political moments is to show how power and accountability becomes distributed (see also Casey, 1997, p. 311) throughout the organisation, by means of translations through material agents such as e-mail systems or meeting rooms. In contrast, moralising moments are constructed by any narrative viewing power and accountability as posited according to a specific organisational typology (powerless workers, powerful management), while ignoring the material conditions shaping and stabilising them.

Thus, political moments are determinable only through an analytical process of reconstructing translations taking place across diverse materialities. This is because these moments happen when modern categories are traversed, and therefore must be viewed as effects of entire networks, rather than as decisions made by intentional human subjects (see e.g. Haraway, 1995).

Dynamics of political and moralising moments

Following Brown and Lightfoot, it could be suggested that theoretical and practical recognition of political moments can take place only if it is acknowledged that discursive statements, propositions or visions are always translated as they are transferred. When this goes unrecognised we enter the domain of moralising moments. We use the term moralising moments became they reduce the actual heterogeneity of practice to simple explanatory schemes (such as the inevitable progress of technology), which ratify specific taken-for-granted courses of action.

But moralising moments are themselves part of translation processes. For instance, in the HVEPS-report, the descriptions of "enormous possibilities" of IT in health care co-exist with the acknowledgement of the many contingent problems that must be solved for them to be actualised. This makes it impossible to posit political moments against moralising moments in a dichotomy. Rather than as a typology of good versus bad politics we view these sorts of moments as markers in continually ongoing processes of everyday practice.

Sites of articulation

In the following we examine two different interdisciplinary working groups within the Danish health care services with the aim of explicating political and moralising moments[1]. In both cases these were effected in part through the inscription in evaluative reports, although the consequences of the inscription varied.

The focus of the first group, HVEPS was on how to implement an information system at a major Danish hospital. The second group worked on a more theoretical and abstract level with the aim of generating ideas for an intensified use of IT among GPs.

The empirical backbone of our analysis consists of publicly accessible articles and reports, on the work, considerations and conclusions of the two work groups. Furthermore, Winthereik carried out participant observation at four out of a total of six meetings at the DDP, as well as at a workshop and a conference. This participation took place from summer 1999 to December 2000.

Planning the implementation of IT: the HVEPS project

Hvidovre Hospital, home of the HVEPS project, is a large and modern hospital. Situated in the Copenhagen area, it has around 1,000 beds, 4,000 employees and an annual budget approximating 1.3 billion Danish Crowns (DSI Rapport 96.05, 1996, p. 33). The hospital also prides itself on its advanced technology use in areas such as "diagnosis, patient care, registration, transport and communication" (DSI Rapport 96.05, 1996, p. 33).

The HVEPS project was carried out from early 1994 to early 1996, at Hvidovre Hospital in Copenhagen. The intent of the project, which resulted in a report (DSI Rapport 96.05, 1996, p. 9)[2], was expressed in the following way:

> ... with the primary purpose of exposing necessary user needs for the electronic patient record, based on a practical pilot test.

The process of uncovering these needs are recalled in four steps in the report: an analytic phase, an accumulation of experience of "EPR-aspects", experiences with the pilot test, and recommendations for further EPR development.

In 1993, it was realised that a scattering of initiatives having to do with the EPR were taking place at various wards at Hvidovre Hospital. This acknowledgement led to the appointment of an interdisciplinary working group with the purpose of uncovering advantages and disadvantages with the introduction of an EPR at the hospital. The working group consisted of doctors, nurses, technicians, a secretary and a representative of the administration (DSI Rapport 96.05, 1996, pp. 33-4). The group went on to develop an "in principle" model of the EPR. In the model, the record itself was to function as a "gateway", integrating the various existing subsystems. Subsystems to be integrated included "intensive monitoring", "lab data", "X-rays" and "record data" (DSI Rapport 96.05, 1996, p. 34).

The development of this visionary model marked the end of the preliminary work of the group, and the next considerations had to do with the possibilities for actualising the "in-principle" model.

On this background, a co-operative effort started in the spring of 1994, between Hvidovre Hospital and the DSI Institute (Danish Institute for Health Services Research), economically supported by the Danish Ministry of Health. DSI is an independent non-profit research institute. One of its concerns has been the development of health informatics in Denmark:

> In many ways, informatics is the prerequisite and the tool for the current adaptation of the organisation and quality development of the health sector to environmental changes. Health informatics is therefore closely linked to DSI's activities within the development of databases for clinical quality (from http://www.dsi.dk/frz_key.htm).

The Ministry of Health supported the project as a part of the national initiative HEP (Action Plan for Electronic Patient Record)[3]. The purpose was to create a basis for the development of the electronic health care record in Denmark. In early 1995, HVEPS was one of 14 such projects.

In the actual implementation process the "in-principle" model and its vision of a seamless work practice had to be compromised for at least two reasons. First, there was an economical compromise rendering it impossible to carry out the initiative at more than a single ward. Second, there was a technical compromise. It turned out that the structural model made "in-house" by the working group was based on technological assumptions that could not be fulfilled by any existing technology at the time. An agreement was made that the Belgian Health one system could be provided for free and used throughout the project, but should not be technically evaluated.

In light of the diminished scope of HVEPS and the problems it was marred by, it is noteworthy that the hopes invigorated by the project were not only virtually untainted, but scaled up, when conclusions were made in the report:

> The HVEPS project has fully shown that the challenges of introducing EPR can hardly be underestimated, but also that the perspectives in this technology are no less than enormous (DSI Rapport 96.05, 1996, p. 7).

Our short description shows a number of re-definitions or translations of the HVEPS project. If the first move was to gather all the EPR resources from many small groups to one centralised, then the second was to formulate a possible vision for the use of IT in the hospital at large. But since the visions did not sustain themselves, and neither money nor technological solutions were as forthcoming as expected, a third moment of translation took place. Here, the project was distributed back to a single ward again. This could have led to the question of how much it was possible to generalise from the pilot project to the overall hospital, or other specific wards but did not seem to do so.

Considering the complex story of iterative trials and errors in the pilot project as it is narrated in the report and the small gains in functionality and instrumentality that this work led to, the enthusiastic conclusion referred to above seems remarkable. It could seem as if extra work was needed to maintain the plausibility of the EPR in the face of continual difficulties.

We have characterised political moments by their relation to the unexpected. We also suggested that this characteristic unpredictability stems from the cross-over of modern categories, such as discourse and materiality. In the HVEPS project we find a central political moment in the translation of the project from large and "in-principle", to actual but limited to a single ward. The down-scaling of the actual implementation process allowed for the up-scaling

of expectation. But this was not solely a discursive phenomenon, since it had to do with economy, organisational issues:

> ... it is important to choose a ward which is stable concerning tasks and staff (DSI Rapport 96.05, 1996, p. 14) and technologies (such as Health one).

The specific events that constituted HVEPS were the net-result or effect of all the particular re-definitions these entities deployed. Undoubtedly a serious learning process took place at the chosen ward. But the point is that the particulars of this process could not have been planned beforehand: possibilities and hindrances were only visible in retrospect. Political moments can therefore only be "caught" in action, and it is unhelpful to rationalise this contingency away. To do so is to ignore the amount of work the construction of such a network would take. It is also to ignore the many negotiations between human actors as well as technologies that would continually work to re-define the system.

Historian of science, Geoff Bowker, analyses an analogous situation in the context of designing biodiversity systems:

> ... integration cannot in principle be smoothly accomplished ... [A]nd ... data cannot be collected without making politically charged decisions (Bowker, 2000).

When discourses refer to the necessity, need or inevitability of specific types of standardisation, and thus efface Bowker's politically charged decisions, we view them as moralising[4].

This can be illustrated with a formulation by a member of the sixth office of the National Board of Health, which was particularly relevant to the HVEPS project, because they were (and are) in charge of the development of semantic standards for the electronic health care record in Denmark (DSI Rapport 96.05, 1996, pp. 70-1; DS-Hæfte 4, 1995, p. 5).

Faced with the heterogeneity of discourses and notions of what such a standardisation might entail, he is led not to question the idea of creating a general consensual language, applicable throughout Danish primary health care, but rather to define the standardisation process as ever more inclusive: more words and definitions can be added at will: "nobody will be missing language" (Hagel, 1998).

IT in the primary sector: the DDP

The DDP was initiated by the Danish Board of Technology (DBT) in mid-1998. The main theme of investigation was decision-support systems, and the sector to be zoomed in on became primary health care, which was already "relatively IT-advanced" according to the project managers.

The project was defined by the project managers as an exploration of solutions to the needs of GPs that should promote the quality and continuity of care given in Danish GP clinics. Like in the HVEPS project, user needs were central as "elements" that should be identified in advance. The exploration was

to take place through an interdisciplinary group study, which was to conduct meetings and participate in a workshop and a conference.

Representatives from eight different institutions were invited to participate in a number of meetings. Among these were representatives from DSI (Institute for Hospital Research), The National Board of Health and the GP association (PLO). The specific focus on decision support did not last long. During one of the first meetings an American expert system was demonstrated, and it was agreed that since decision support would be only a tiny part of the use of IT in primary care, there was no reason to restrict the project focus to this technology. It was suggested that since technological possibilities for creating good experts systems already existed, such systems would be adopted in the practices sooner or later anyway. Thus the workgroups decided to widen the scope of exploration to encompass the use of codes and online booking from patients' homes.

This investigation turned out to be problematic since it could not be carried out without consideration of any number of factors "external" to the explorations, such as the relation between GPs and the National Health Service, or GPs and the National Board of Health. Thus, historically "ingrained" organisational and political issues set restraints that were not easily compatible with medical visions of the future with IT. These underlying issues made visible the fact that no unitary conceptualisation existed for the future of IT in GPs' practices, and that there were serious divergences between the GPs self-understanding and how they were understood by the rest of the participants.

At the first meeting, the two GPs in the group were asked to make an account of the ways in which IT would be able to support daily work in their clinics. The GPs emphasised that the communication between clinics and hospitals could be made better and more efficient, and presented suggestions as to how this could be done. It was, for example, stressed that all hospitals should start sending discharge letters electronically, and that there needed to be a higher degree of uniformity with regards to content. According to the GPs, IT could also be of use for communication between the various GP practices. The implication of this was that the GPs did not have to change their main tasks, but would basically still work as "gatekeepers" to other health care services.

During the following meetings, a number of issues were discussed but two main topics stood out. The first had to do with the demands made on GPs by the National Health Insurance, the second with the development of standards. The main arguments were that it would become more and more important to measure the performance of GPs in order to ensure the quality of care[5]. IT could be of central importance for such monitoring since coded patient data could form the backbone of comparing the performance in primary care. Second, it was argued that to ensure a higher degree of structuring of the information exchange between hospitals and GPs, the GPs would have to use codes as a part of their clinical work. According to the representative from the National Board of Health it was very important that the GPs themselves made

specifications for coding. Otherwise the GPs had to expect that "the rules of the game would be made centrally".

At this point, a number of GPs were invited to participate in a workshop to further the discussion on needs. Approximately 30 GPs took part in a computer-mediated discussion session, which focused on a number of topics in relation to the aforementioned themes. However, in the subsequent evaluation on the workshop by the study group, what was focused on was primarily the scepticism GPs showed toward the use of codes. In the understanding of GP's the use of codes would lower the level of service since the time spent on coding would be taken from the patient. Accordingly, the use of codes could have little purpose other than enabling actors outside the clinic (the association of counties and the National Board of Health) to be able to carry out a higher degree of surveillance.

From this perspective nothing was wrong with standardising work routines to ensure better communication between the primary and the secondary sector. But this should not pose a threat to the content of clinical work (understood as the personal interaction between the GP and an individual patient). The rest of the participants in the DDP group were opposed to this view and wanted the GPs to be interested in specifications. In their view, standardisation of concepts (and the use of codes) could very well be seen as independent of the standardisation of work routines. What was at stake was related to the self-image of GPs as referring – as fulfilling a gate-keeper function[6]. According to the GPs, intensification of the use of IT should not imply a change of that role. To other participants precisely such change was crucial.

To "non-GPs" the future image of the GP was not a gate-keeper, but a "spider in a web" – an information manager. The envisioned GP would collect the necessary information by means of his access to, for example, clinical databases. This envisioned GP would be able to treat the patient on the basis of knowledge made accessible by IT. Coding became crucial, since the GP could only take on the role of the information manager if he was willing to provide those who maintained the databases with complete information of his performances in the clinic. These conflicting images of the GP translated into a third image in the document that contained ten recommendations for the parliament that was produced at the end of the project.

How was this document constructed? Participants were to each write a "visionary essay" on the future use of IT in primary health care. A science journalist was hired to support the writing of the essays. In fact most ideas were transformed in the process, as the journalist made them more publicly "edible", and less "technical". The change in genre from the writing of GPs to journalistic writing thus carried its own translation process. This is indicated in particular by the most "praised" of these essays, which was "so visionary" that the journalist hardly needed to re-write it. This essay contained a description of the GP-patient relationship in 2005, in which the GP monitored the patient and her family from his computer, and used e-mail to deliver

information and send reminders. In this scenario, the visionary content was high while the focus on the practical problems of implementing IT system in the sector was downplayed.

The ten recommendations were eventually presented to a committee under the Ministry of Health. In these the present situation was characterised by a general "lack of good quality service, and the best treatment possible", and it was argued that the right documents were often not available to the involved health care providers at the right time[7]. The health services were not seen as functioning to an extent where good service could be provided for all patients. The solution to this predicament was a coherent use of IT in the health care sector. Coherence and integration of various systems would ensure faster and more flexible access to the necessary information when it was needed. Furthermore it was argued that:

> . . . if the health care sector does not succeed in jumping at these new opportunities, it would be increasingly difficult for the general practices to keep its position as the supplier of advice and knowledge to the Danish population.

As in HVEPS, a number of translations happened during the course of the DDP, however, the specific nature of the translations were different. The first translation transformed the subject matter which the group was expected to discuss, from decision support systems to a focus on how to develop standards and coding procedures. A political moment arose as questions of GP identity, the value of the present organisation of GP work, and autonomy and integration between sectors were discussed. The second translation changed the focus on the needs of the GP to a focus on the needs of patients. Like in the HVEPS project, user needs were central. However, the moment the gap between the professional became too wide, needs were translated from referring to GPs to referring to patients.

Within our frame, this translation work indicates that the DDP may be understood as a project carrying invisible political weight: political moments are decipherable by following the series of translations we have pointed at. These include not least the construction of visionary essays, the results of which could be re-translated in the end document in a definition of GPs as "suppliers of specialised knowledge". While it would have been difficult to agree that the "specialised GP" was the right definition of GPs, this became possible by means of a detour through the genre of "science journalism".

Translating visions

> The enjoyment of the thing itself is thus undermined in its act and in its essence, by frustration. One cannot therefore say that it has an essence or an act. Something promises itself as it escapes, gives itself as it moves away, and, strictly speaking, it cannot even be called presence (Derrida, 1976, p. 154).

We have illustrated our notion of political and moralising moments by the work of two working groups in the Danish health care system. In HVEPS the

size of the project diminished, but this allowed the pronouncements made on the background of it to enlarge. Throughout the official HVEPS report this fact emerges in the uneasy tension of various statements:

> User responses confirm that EHCR can drain personnel resources initially. It has not been easy to see where any time has been saved. However, over the long term, everyone can see the advantages of introducing an EHCR system. The project was subject to heavy time pressure. For example, it was difficult to incorporate the instruction needed – considered insufficient from the start – into daily work. Information was not what it could have been either, which again influenced motivation and commitment. In contrast, technical support was unimpeachable, and helped shore up enthusiasm for the project (DSI Rapport 96.05, 1996, pp. 21-2).

In this bit of analysis it is very hard for the authors to simultaneously emphasise the relevance of the project and acknowledge the problems it was marred by: "the enjoyment of the thing itself is thus undermined by frustration". The work of translation seems painful to articulate but, in spite of this, the authors of the report suggested that the prospective benefits of using more IT at hospitals were "no less than enormous".

HVEPS presented itself as a success but as we have indicated such an interpretation is not self-evident. Rather, it would seem that the specifics of the project was felt as annoying, lacking resources, time and information (technical support aside). Projection into a future in which these practical contingencies were solved, allowed optimism to endure. Thus, the HVEPS report constructed a specific vision of the future of hospital health care, backed by IT.

In the case of the digital doctor, the work of re-definition had to do with changing the image of the Danish GP from a gatekeeper into an information manager. This transformation did not happen solely by means of the imaginations of the members of the work-groups. Specific mediations were instrumental in allowing the work of translation to happen. Instead of detailed analysis of how to practically accomplish different sorts of IT development, implementation and integration, the focus turned to the construction of visionary accounts of the future of the Danish general practices. The established equivalence between information and knowledge, presupposed by the notion of the GP as primarily a manager of coded patient information came to be seen as natural, when the work of mediation conditional for the possibility of this particular translation was forgotten.

In the DDP, a diversity of opinions on the possibilities of IT, rather than unequivocal enthusiasm, was encountered. In the "ten recommendations", however, heterogeneity was glossed. All that remained was a note at the beginning of the ten recommendations that "the members of the study group do not agree on all viewpoints presented in the document". Instead it was stressed that IT provided "new opportunities" which GPs had to "jump at", in order to maintain their "positions as suppliers of advice and knowledge to the Danish population".

Reports and recommendations as material agents

> We know that these exchanges only take place by way of the language and the text, in the infrastructural sense that we now give to this word. And what we call production is necessarily a text, the system of writing and of a reading which we know is ordered around its own blind spot (Derrida, 1976, p. 164).

Both of our sites of articulations constructed texts: evaluations, reports, recommendations, and information leaflets. Indeed, these texts form a large part of the background of the present analyses. In conclusion, we want to discuss the particularity of these actors and how they were instrumental in framing the understanding of such projects as HVEPS and the digital doctor. Viewing these reports and recommendations as a specific "genre" of material actors is consequential for our reading of the simultaneity of contradictory arguments.

The HVEPS report and the DDT recommendations were both characterised by tensions as they struggled to simultaneously contain heterogeneity and glossing it. We do not think this is a matter of "performative contradiction". Rather it points us towards the report/recommendation as an actor whose aim is to bind as many diverse practices and opinions as possible together. Thus, reports of this sort are negotiation devices that, through their own agency, allow otherwise incompatible viewpoints, and thus professional practices, to co-exist and even define themselves as aligned.

It could be suggested that the ability to carry contradictory meanings in this sense, is a specific feature of these types of reports. If this were the case, this sort of writing would be interesting precisely because it is able to flexibly negotiate the expectation of the new (improved use of IT) with the disappointing acknowledgement of the work that is needed to accomplish it. For instance, the ten recommendations that were the result of the DDP allowed for some degree of alignment between the Danish Board of Technology, the National Board of Health, the National Health Insurance, and some Danish GPs, through a visionary (if modest and compromised) account of the future of the work practices of Danish GPs.

If a primary function of such reports and recommendations is to work as negotiation and translation devices between seemingly incompatible definitions of what should take place, then their flexibility should be viewed as a strength, not as a problem. The negotiations of this writing process or the construction of political inscriptions taking place through the genre of ministerial leaflets is one (humble) way in which the relationship between Danish primary health care and the use of IT is stabilised. Through and by means of such documents as material actors, the "natural" cause of action in health care is shaped and re-defined.

Nevertheless, the need for a type of writing facilitative of such mediating work is only necessary because we are unable to capture the moments in which translations happen in practice. The intention with the notion of political and

moralising moments is to be able to capture some of this invisible work and articulate the importance of it.

Hence, we are not interested in opposing or criticising the work done in the groups discussed for being wrong-headed or unscientific. But we claim that it is necessary to place oneself in a position in which translations can be recognised and articulated in order to properly conceptualise the processes in which one partakes.

Thus, from our perspective, the relevant problem to point out is not that processes of envisioning and experimentation are a bad thing, but that they involve a fundamental political undecidability. This undecidability is rendered invisible, in theory and practice, through moralising moments. Being able to recognise invisible political moments could enable new sorts of accountable writing that would not rely on moralising tales of technology and progress.

Notes

1 The notion of sites of articulation follows Layne (1998). It highlights the negotiable character of the processes that take place in the groups.

2 Unless otherwise, notes page citations in this section refer to this report.

3 At http://www.hep.dk

4 In Bowker's case the politics were effaced by interpreting politically charged questions on how to standardise biodiversity data (according to the concerns of which disciplines?) as a matter of improving meta-data – data about data. This is an equivalent to the Danish conceptualisation of semantic standardisation of the electronic health care record: here, as we will see below, the claim, in the face of politically charged decisions, is that "no one will be missing language".

5 Project aims and development can be found at www.tekno.dk/projekter/index.htm

6 Which involves seeing the patients before they are sent further into the health care system.

7 This sort of argument is ubiquitous in contemporary Danish discussions on medical quality (Informatikafdelingen, OUH 1999; Kjærgaard *et al.*, 1999; Århus Amt, 1998; Sundhedsstyrelsen, 1999).

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Appendix B

B. R. Winthereik:

"Patient Information Encoded: General Practitioners' Production of Standardized Data in an EPR"

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Patient information encoded

General practitioners' production of standardized data in an EPR[1]

Brit Ross Winthereik

Electronic patient records and new forms of registration

During recent years the electronic patient record (EPR) has come into more intensive use. The EPR is being used not only for administrative purposes as in the early 1990s; it also plays an active part in the clinical work. Implementing new technologies such as an EPR changes the nature of health care work. Responsibilities are reorganized, and new tasks and risks come into being when clinical information is standardized (Berg 1997, Svenningsen 2002).

Apart from the clinicians, who may find standardization of patient information a useful step to be able to search their data bases, a number of other actors are interested in this form of standardization. Politicians and health service administrators all over Europe are increasingly aware of the potentials in being able to collect electronic data and use them for management purposes. Stimulating practitioners to standardize patient information and do clinical audit is one way of doing this and becomes a way in which practitioners can demonstrate that a practice lives up to evidence-based standards. Standardizing data is thus partly done with the purpose of collecting data for clinical research and evaluations of the quality of care (Lawrenson 1999, Knottnerus 1999, Kjærgård et al 1999, Mainz 2003, Schroll 2001).

This chapter deals with one of the tools general practitioners' (GPs) use when producing standardized patient information: the diagnostic code. Coding means attaching a combination of letters and digits to a piece of clinical information. Fever, for example, has the code A03 according to the International Classification of Primary Care (ICPC) and r50 according

[1] This chapter is written on the basis of an article published in Methods of Information in Medicine (Winthereik 2003) and a chapter of an edited volume (Svenningsen and Vinge forthcoming). I am grateful to Susanne B. Jespersen for proofreading.

to the International Classification of Diseases (ICD-10).[2] As a form of standardization, coding happens to make data accessible to actors that are external to the practice, as well as to structure and order information for internal purposes.[3]

The curious thing about codes is thus that they are expected to 'coat' clinical information in a way that allows it to 'travel' between contexts and perform in several contexts at once. This makes the code an interesting object of study. From an empirical point of view, it is highly interesting to see how practitioners make the code do this. What everyday tasks are connected to coding and what kinds of dilemmas arise from their use? One of the dilemmas treated in this chapter is that GPs often experience the code as a tool that freezes symptoms and diseases, while the GPs still need to see how this symptom develops. Classifying a symptom or a disease by means of a code does not necessarily bring clarification for the GP in the primary care process, but may instead – the code suggesting finality – strengthen the uncertainty connected with the diagnosing. One of the interviewed GP puts it this way: *"There are so many ways of coding and I find this a problem, because it is hard to tell which principle to go by. Do I want to write "aching arm" or "fracture"? It's hard to decide how specifically you want to code*." The quote touches upon the dilemma that arises when the physician has, at the same time, both to add a code to a diagnosis and keep her eyes open for new developments. Also theoretically, the code is an interesting object, as the code is expected to add stability to something, symptoms and diseases, which are constantly changing. Patients see doctors because they want to get better and different doctors act differently on what patients tell them. Besides, patients tell different things to different doctors. Diseases are thus, per definition, in a state of flux, which makes representations of them a difficult endeavour.

In the following, the focus will be on how coding is done in practice[4]. Following M. Berg's studies of how formal systems are established, changed and worked around (Berg 1996a, Berg 1996b, 1997) the entry point is the assumption that codes and classification systems are not just formal systems that unambiguously represent patient treatment. Instead, work must be carried out to make the everyday work 'fit' the code, and in this process both the represented work and the code change. As the following demonstrates, coded data are constructed under

[2] ICD-10 is the classification usually employed in hospitals and ICPC is used in general practice.
[3] An instruction for how to use ICPC codes explains that the advantages of coding record entries are that GPs obtain "[s]tructure, safety, and overview of the patient trajectory". The instructions referred to here have been made by the Danish College of General Practitioners (DSAM) and distributed to all Danish GPs.
[4] See, among others, Mol 2002, who argues for an empirical philosophy, i.e. rooting studies of the interaction of the social and the technological in empirical studies by focusing on what is *done* by individual actors rather than on *a priori* assumption of these actors having definite roles.

specific social and material circumstances; they are contingent on local work arrangements, priorities, and negotiations. As coding may be seen as a kind of a translation work GPs carry out to turn patient information into manageable data in the EPR, studying coding is also an occasion to study the complexity of the interplay between social and technological factors in everyday medical work.

Methods and theoretical orientations

The following analysis is based on empirical material collected during ethnographic fieldwork in six general practices in the Netherlands, Denmark and Britain[5]. The fieldwork was conducted in the beginning of the research trajectory and not only the coding, but many of the activities and tasks that were carried out by the GPs were new to me. Some may see unfamiliarity with a practice as an obstacle for good data generation. Among ethnographers, however, this is often seen as an asset more than as a problem, as being a newcomer or even a stranger may refrain the ethnographer from relying on preset research agendas and instead be open towards practitioners' accounts and practices (Hastrup 2003). The material used here stems from observations of everyday work as well as from interviews with general practitioners. Starting out by focusing on EPR-use on a broad sense, my attention was increasingly drawn towards accounts and practices around coding. An issue that kept appearing in all the practices studied, was the issue of 'the right code', as practitioners often asked themselves which code to use in which case. The notion of the right code thus soon became my fix point in trying to unravel the practices around standardization and classification in GP work.

Even though the fieldwork took place in a number of different practices within the Netherlands, Denmark and Britain, I will refer to the British, the Dutch, and the Danish practice in the following. The reason for this is that even though ICT systems and coding practices differ from clinic to clinic, all the clinics in each country use the same coding system and are subject to the same directives with regard to coding. As analytic constructs the countries, thus, form a framework that makes it possible to focus on differences between different coding systems. The choice of the specific countries is based on the one hand on practical considerations with regard to access (i.e. language restrictions and a limited travel budget), and on the other hand on the widespread use of EPRs among GPs in the chosen countries (de Maesener 1995). As mentioned in the introduction, one of the intriguing things about codes is that they at the same time are expected to be flexible enough to perform in different contexts, while stable enough to represent

[5] The fieldwork was carried out between January 2000 and March 2002. See also Winthereik 2002.

clinical work unambiguously. It is therefore difficult to gain sufficient insight into coding by statistics alone. Statistics may offer insights into the distribution of EPRs in a geographically defined area, but does not offer any insights as to what work is connected with coding or as to how coding transforms clinical work tasks.

Wishing to move the analysis away from a macro or a meso level, I have found theoretical inspiration for the analysis in science and technology studies (STS). One of the main points in the existing STS literature is that technology is not neutral; at the same time it does not determine social practice unambiguously. How, precisely, social practice and technology influence each other should thus be subject to empirical analysis (Bijker 1992, Law 1995, Pickering 1997, Mol 2002, Latour 1987, Latour 1994, Costall 1997).[6]

Of particular interest here is the concept of the immutable mobile as introduced by science philosopher and anthropologist B. Latour (1987, 1990 and 1999). Latour deploys the notion of the immutable mobile to understand how some technologies seem to be very powerful in 'transporting' information across contexts. The concept points towards an interesting aspect of some entities; those entities are materialized (and thus immutable), yet mobile enough to travel in time and space and thus in principle open for modifications (1990:26, 1999:307). This also seems to be the case with a piece of clinical information transformed into a diagnostic code. Latour exemplifies what an immutable mobile is by means of a map (1987:215pp). Constructing a map is a tedious process that involves processes in which information about the location of rivers and cities is transformed into signs and symbols when inscribed into the materiality of the map. Once constructed, a map is relatively stable in the sense that the information it contains can be transported across large distances (for example from the Pacific to France). As the map enters into relationships with new actors on its way, the map allows others to act at a distance (for example create European dominance in faraway places).

The comparison of an immutable mobile to the code, which also in some sense allows actors outside the GP practice to act at a distance on what happens inside the practice, however, is not the immediate reason for introducing the concept here. The point is to suggest a framework within which to understand how the code works, or rather, is *made to* work. As we will see in the following, the code is no omnipotent vehicle for medical information in and by

[6] See also the thesis introduction.

itself. Instead, GPs put much effort into making the code a tool that is useful for a number of purposes inside as well as outside the practice.[7]

There are also researchers within STS, who have dealt more specifically with issues around classification and coding, for example information scientists and historians G. Bowker and L. Star, who have done extensive research on classification (Bowker and Star 1996, 1999, Star 1991). They suggest three approaches to the study of classification. First, a historical or archaeological approach that brings forward the construction of classifications. Second, to study classification from the perspective of those, who do not 'fit in'. And third, to study the practices and dilemmas related to working with classifications on a daily basis. In the following, I will build on this last approach when describing the work it takes to make a code in GPs' daily practice. The central analytical questions will thus be: *What kind of work do GPs need to carry out to turn the code into a vehicle for clinical information, and what dilemmas are created for the GPs in doing so?* In the following, I shall present the three practices in turn to demonstrate how the code participates in changing both the way health work is carried out, and its content.

The Danish practice

Danish GPs using an EPR code according to the ICPC-classification (International Classification of Primary Care). In addition to the standard version of ICPC (WONCA 1998), they have an extension of the classification at their disposal. This extended version, known as ICPC-e, has been adapted to Danish conditions, as it contains terms and phraseology in everyday use by Danish GPs.[8] This makes it possible to code a patient's condition by means of the terms in daily use in the practice. ICPC-e makes the classification system more fine-meshed and allows, in addition to a coding based on everyday language, a translation of ICPC codes into the ICD-10 codes used in Danish hospitals (the 10th version of the International Classification of Diseases).[9]

[7] In the following chapters I go into detail with how coded data make 'acting at a distance' possible (for example in chapter 2, where it is described how coded data can be used for external audit).

[8] In addition to making a code more sensitive by means of ICPC-e, Danish doctors may broaden an ICPC code by adding the letters H, O, C, U or S. The letters (HOCUS) stand for 'head', 'upper extremities', 'corpus', 'lower extremities' and 'skin', thus adding to a code information about the locality of a pathological condition. So, just like the extended version of ICPC, ICPC-e, HOCUS makes the code more specific.

[9] This translation is done by means of semantic patterns that match automatically one code from one classification system with one code from the other system. In this way, an ICD code is automatically added to ICPC diagnoses in electronic letters from GPs to hospital doctors and specialists. So, in theory the extension serves as a mediator between the classification systems of the primary and secondary sectors, the idea being to use the technological infrastructure to link practices with other professional groups (Bowker and Star 1999 use the expression 'community-builder' to describe how information infrastructure can establish contact between otherwise separate groups). In practice, however, this does not work without problems. In interviews, for instance, several of the Danish GPs complained that ICPC-coded referral letters would 'return' to their practice as ICD-coded discharge

In the autumn of 2000 one of the biggest suppliers of IT-systems for GPs in Denmark came out with an updated version of EPR in which information was structured around the use of diagnostic codes. This increased the pressure on GPs for coding clinical encounters. In one of the Danish practices in which fieldwork was conducted, the GPs began to code more primarily because they feared their IT-supplier would treat them less favourably if they did not use codes. They imagined that the former version of the system would be withdrawn from the market, and that their practice, as all other practices would upgrade their IT-systems, would 'fall behind'. The fear of falling behind, however, was not based on any concrete examples of health care work, which they would become less good at doing. The reason for upgrading into the new system was rather a vague feeling that in the future, GPs would have to produce documentation for their work.[10] In this extract from a group interview, three GPs give accounts of how they experience ICPC-coding.

> **Dr. A: "**There are so many ways of coding. And I find this a problem, because it's hard to tell which principle to go by. Do I want to write 'aching arm' or 'fracture'? And when they come to see me before there's a fracture, should I then write 'fracture obs' [obs for observation] or 'symptoms from right arm'? It's hard to decide how specifically you want to code."
>
> **Interviewer: "**Haven't you made any mutual agreements within the practice on how to code?"
>
> **Dr. A:** "You may reach agreement about a lot of things, but every little encounter can be recorded in 101 different ways. Today a woman came in because of pain in her abdomen. She wanted her breasts felt for lumps and wanted me to make a smear from the uterus, because they had forgotten to call her in. Then you can use a code with an 'X' indicating that it has to do with 'female genitals, mammae included'. Then you may feel you have made a lucky strike, but then again, it is not very specific, as I said it can always be discussed what code to use."
>
> **Dr. M: "**I try to be more specific, but I need an overall strategy so that I don't diagnose the same thing in different ways, though, sometimes, it's all right to do so. We had that fellow with a chronic wound in the forehead. Was it this, was it that? So I have started to use slightly larger 'boxes' when I code, because I have to find out how to use the thing".

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letters (see also Winthereik and Svenningsen submitted). This causes problems when filing the discharge letter in the ICPC-coded EPR.

[10] Since the fieldwork described here took place, a future in which GPs must increasingly document what they do has partly come true. Initiatives for implementing quality systems into primary care are tried out and in general, health authorities and the public demand more transparency with regard to what the GPs are 'good at' (for instance through publishing the courses they have ever taken on the practice's web page; most practices, however, do not yet have such a page).

Dr. A: "I, too, have started using larger 'boxes,' unlike in the beginning where I thought it was great if I could find an absolutely specific diagnosis - wow - there you really got the match! But if you consider what you are going to use it for, for instance for later making a search on everything about 'skin' or 'abdomen', then, perhaps, my entries don't have to be that specific."

Dr. J: "We can always choose to put it in broad terms [a symptom diagnosis], for instance under 'skin' and then only add a proper diagnosis later."

Dr. A: "I used to do that. I started by calling it 'other encounters about mammae', that is, something very unspecific, and when later on it develops into breast cancer I call it 'cancer mammae'."

Dr. J: "Yes, it gives a wrong picture of our work if we claim that we are able to immediately say: 'This is cancer'. Often we must examine things further, and the code needs to represent that style of working."

(Interview with Danish GPs, 2001)

The issue of how to find the right code is a central concern in this interview. The excerpt demonstrates how difficult it is for the GPs to decide whether the right code is one that fits the pathological condition here and now, or one that makes data accessible with other purposes in mind (such as to know how patients with skin problems have been treated). The GPs discuss whether some common criteria for coding can or should be shared among all GPs in the practice or whether developing good coding strategies should be an individual concern. But despite the fact that the GPs are concerned with finding the right code, they also agree that 'the right code' is an illusion. The challenge they need to deal with, thus, is: How to find codes that both represent what they are doing (the local situation) and that can potentially be used for yet undefined purposes.

At the time of the interview, coding was still a relatively new activity for those GPs, which perhaps partly answers why it did not make much sense for them to code. They still needed to see how their own work could possibly benefit from coding. Nevertheless, or perhaps even *because* coding had not yet become normalized everyday practice, the Danish GPs were quite elaborate about some of the dilemmas of using codes. They also explained how it was a cause for frustration that it had not been specified for them how encoded information could be used for other purposes than for the primary care process. They found little support in the guidelines made by the GP association and distributed together with the update of the system. The advice was: Code as much you can and code as specifically as possible (Aeskulap 2000). In

practice, however, combining specific and less specific codes precisely proved to be the problem. If, on the one hand, the GPs coded everything in connection with a consultation, their codes taken as a whole would become more unspecific - the EPR would simply contain more observation codes and thus be more general. If, on the other hand, they coded fewer things and only diagnoses, they were sure that the EPR would contain more codes on the whole, but the total amount of codes would be less comprehensive and would not represent their work in a satisfying way. The strategy they decided upon in the practice, was to make coding an individual matter and wait and see how much of their work they would really need to document, meanwhile producing a record, which was slightly better to work with, because it offered the possibility of making more structured overviews of individual patients' records, but which could hardly be used for so-called secondary purposes (for instance research purposes).

If, to analyze the Danish GPs' considerations in relation to how to use codes, one regards the code as simply a 'container' for clinical information, it becomes very difficult to understand the challenges that coding present to them as anything else than a 'wrong' or 'not yet developed' use of the EPR. If, instead, we consider coding a process of inscription and translation in which information is inscribed into the materiality of the EPR through a specific letter-digit combination, which transforms the information inscribed, the dilemmas of coding (as a process of transformation) become more obvious. Creating a code which may allows clinical information to be used *both* in a different way inside the practice (new overviews can be made) *and* to be used outside the practice (for research purposes), means that the GPs need to develop coding strategies and carry them out. This creates a dilemma between on the one hand feeling one is making a diagnosis too early but creating a detailed and specific EPR, and on the other hand staying open enough for observing how a symptom develops but creating an EPR containing only very general information.

The Dutch practice

Like their Danish colleagues Dutch GPs use the ICPC classification. They have their own ways of making ICPC-codes more specific, but unlike the Danish GPs specifying codes is not solely done through an extension of the ICPC itself. Having been used to working with codes since the early years of GP computing (Berg 2004), the Dutch GPs have a different practice around coding, but as we see this is not only because they are more used to working with codes in EPRs or have developed coding strategies collectively. It also has to do with the way their EPRs are structured and with the fact that some purposes for the coding exist.

Patient records in the Dutch practice are by definition problem-oriented, which means that information in them is structured around 'problems' and 'episodes', where the 'problem' refers to significant conditions (past and present) and 'episode' refers to smaller encounters. When possible, the 'episodes' are linked to a 'problem' in the record. The problem-oriented patient record was originally introduced to heighten the status of medical records. From being the physician's personal notes on a case and its development, it became a scientific document.[11] When the Dutch GPs started to use EPRs, categorizing information in the patient record according to problems became part of the electronic system as well. This means that today all entries are in principle categorized around the SOAP classification (Subjective, Objective, Assessment, Plan). Symptoms are entered under S, test results under O, for instance, blood pressure or cholesterol checks. A contains the diagnostic code and P has the information about the medication the patient is on.

The problem-oriented patient record is in use in practices all over the Netherlands, and even though the purpose has not been to use the SOAP classification to stimulate GPs to work with codes, SOAP, when used, *does* have that effect. This is due to the fact that the division into S and O encourages the physician to enter a code under O *and* a description in free text under S (that is, not coded). The GPs, therefore, do not feel that the code is the only description of a patient's problem in the EPR. Through the free text note a description of a symptom can be made more detailed and some degree of vagueness may be introduced, which is sometimes necessary. The GPs I talked to did not experience coding as a limitation of their possibilities for recording information, but rather as a kind of extension to the free text note. But let us enter the practice and see what kind of work the Dutch GPs must carry out to turn the code into a vehicle for information.

The interface of the EPR in the Dutch clinic has been designed in a way to allow the GP to click on an 'ICPC-button' on the PC screen with the curser whenever he or she wants to add a code to a piece of information. This brings out a list of codes from which the GPs can choose. Like their Danish colleagues, Dutch GPs find that - in spite of the list - it is sometimes hard to pick the right code. Nevertheless, in the Dutch clinic the incitements to use codes are more obvious; on the one hand the code enables them to use the problem-oriented record by

[11] Berg (1997) describes how several scientists, among others Fernstein and Weed, joined forces to use the problem-oriented record to turn medical practice into a 'real science': "In the "problem-oriented record" all data, action plans and progress notes of all personnel involved are to be organised around the problem(s) of the patient. In this way physicians can *act scientifically*" (Berg 1997: 23).

structuring the information around 'problems', on the other hand the code allows them to participate in research projects initiated by researchers at a nearby university (one of the GPs in the practice was himself connected to the academic world as both researcher and lecturer). At the time of my fieldwork in this practice, the GPs collected information for a project about prostate problems.

Apart from using codes to create structure and to collect information for research purposes, the Dutch GPs use codes to be able to use a vaccination programme, in which patients who have been vaccinated against the flu are recorded. The programme helps them both to keep track of which patients they need to recall for a vaccination and to document to the health authorities what kind of refunding they are entitled to. In the following quotation, a Dutch GP gives his view of working with the programme.

> **Dr. P: "**Evidence-based research has informed our decision to vaccinate special groups of patients against the flu in this country. About 3000 people, I believe, are saved yearly from dying from the flu. It is not the dying as such that is a problem, but people should not die from the flu. Elderly people over 65, asthmatics and people with a heart condition are at risk, so to find those patients and recall them we run a search in our EPR."
>
> (Interview with Dutch GP, 2001)

Later the GP explains how it is sometimes difficult to get an accurate list of all the patients they need to recall. If they would only search on the basis of codes they would miss a lot of people. Instead, the GP needs to extend the search criteria and search via the medication people are on. For instance, many asthmatics use an inhaler, but searching on the code for the inhaler is still not a 100% safe way, as some non-asthmatic people use an inhaler, too. So in the end, a list is produced which the GP has to run through manually to check whether the right patients, not too many and not too few, are on the list.

I describe the effort Dutch GPs put into recalling patients for vaccination as a way of demonstrating the work that goes into making codes useful for more than one single purpose in this practice. Compared to the Danish GPs, the Dutch are able to use codes for other kinds of purposes than for creating structure in their EPR, yet, being able to code for the primary care work as well as for research and to use the codes as the basis for vaccination recalls does not necessarily mean that the coding implies less dilemmas. Like the Danish GPs, the GPs in the Dutch practice are concerned with the dilemma of fixing a diagnosis too early, but less so as they

are used to the possibility of writing in free text next to the code. Using a problem-oriented record, however, has its own work tasks, as it must be negotiated internally in the GP practice what counts as 'problems' and what counts as 'episodes'. The boundary between problem and episode is far from clear-cut. Moreover, using codes for research purposes and vaccination recalls creates a new dilemma. This is the dilemma of experiencing that the EPR extends its functionality by means of the code, while simultaneously experiencing the codes' limitations. As demonstrated above, the GP needs to work around the limitation of the coding by for instance double-checking the lists produced on the basis of codes. To find the right patients due for the flu vaccination, the GP has to search on several parameters in order to make sure that the search is complete. In spite of the fact that this physician and his colleagues spend time on coding and are quite devoted to it, it thus takes an additional round of work before they can use the coded information to find specific groups of patients. The physician must search under several different codes and types of information and then manually remove the patients who are not in the relevant target group. The same counts for the research projects, the success of which depends on agreement internally in the practice that patients with a specific problem are coded more carefully. So the dilemma for the Dutch GPs arising through the use of codes, is the dilemma of wishing to use the EPR for several purposes, while experiencing that they need to devote extra time to carry out those tasks in a way that makes them benefit from the coding.

The British practice

Among the GPs in this study, the British were those, who had used codes for the longest period of time. Most of them even had a very relaxed attitude to coding, which contrasted the worry of especially the Danish GPs. One of them expressed it this way:

> **Dr. H: "**We feel that what we fill in is our working understanding. Encoded if possible and if not possible then in free text. And if we are doing it often, then we will create a code for it. If you take the example of somebody, who is suffering from depression they may present to you first of all that they want to discuss sleep disorder, and the next time you see them and you have treated them to help them with that they might start talking about being tired all the time and the next time they might talk about their mood and about being depressed."
>
> (Interview with British GP, 2001)

In British GP practices, it is obligatory to use the Read classification, if the National Health Service (NHS) paid for the clinic's initial EPR expenses. The Read classification, named after Dr. James Read, who developed it, contains a vast amount of codes and clinical terms. The Read

classification is sometimes referred to as an encyclopaedia of medical terms and phraseology, which cannot be said of ICPC, wherein many everyday terms have not been included (Smith 1995, Roscoe 2000). In the Read classification, a code is a unique designation of a symptom; its structure is thus very fine-meshed.[12] The Read classification is made up of more than 100,000 codes; a GP using Read codes thus has considerably more codes at hand than have Dutch and Danish GPs. 'Asthma' is for example designated H33, 'asthma sometimes restricts exercise' is called 663e0, and 'family history of asthma' is called ZV175 in the Read classification. One of the reasons for the many codes is that the Read classification also contains a detailed section of codes for the patient's social background, referred to as 'social codes' by the GPs. Code 13gA, for instance, indicates that a patient was born in Tchad. ICPC also has a section for 'social relations' (all codes starting with a 'Z'), but far from as many as the Read classification.

The amount of codes and the encyclopaedic structure of the Read classification in some sense makes it easier for physicians to classify patient data during consultations, as there will always be a code that will be seen as the right one. At the same time, the highly detailed classification makes it hard to look up and compare data in the EPR at a later stage. To make this very fine-meshed classification system meaningful for other purposes than the primary care work, British GPs 'bundle' the codes in order to limit the number of codes available to them. Some of the GPs I interviewed explained how they had developed 'patterns' or larger groupings of codes (some referred to this as 'practice codes', because the specific groupings could be different from practice to practice). Moreover, the newer versions of the Read classification attempt to group codes in larger boxes. A British GP describes her use of codes the following way:

> **Dr. L: "**It has become quite natural for me to code, but there are so many codes for so many things. When we started to use the Read code, and decided to go paperless, we invented some codes of our own. That means that when you are seeing some patient and you don't want to apply to that person's condition just a unique diagnostic code you enter a pattern. Within that pattern there are even larger categories. In that way we avoid having six different designations for heart infarct. We are six partners in this practice, and we have to avoid using six codes for the same condition. So with the patterns – as we usually refer to as 'practice codes' – we try to reduce the number of codes available to us."
>
> (Interview with British GP, 2001)

[12] The Read classification can be found at: http://www.nhsia.nhs.uk/datastandards/pages/ddm/Data_Dictionary/Classes/class_READ%20CLASSIFICATION_frame.htm

In this quotation the physician describes the work she does to make the Read classification *less* fine-meshed so as to avoid coding pathological conditions or symptoms that are very similar with widely different codes. She explains how, in principle, it is possible to code the same condition with six different codes within the Read classification. Coding the same condition in six different ways is not a problem for the consultation work, but it constitutes a problem if she later on wants to know how many patients in the practice suffer - or have suffered from a heart infarct, and how those patients are being or have been treated. If each of the GPs has been coding information according to different strategies, there is no way of knowing whether the codes represent different clinical conditions. The strategy of coding according to groups is thus a way of limiting the number of codes. Overall this causes the codes contained in the EPR as a whole to be less specific, but on certain diseases the codes are specific. This is due to the NHS' requests for data on specific diseases and conditions.

Compared to the Danish and the Dutch practices, the British practice has rather elaborate means of producing data for secondary purposes, as the NHS request them to produce data on specific areas in order to be able to measure the quality of care on those areas nationally.[13] Practically, this means that GPs use the codes in their EPRs as the basis for reports about how they perform on the selected categories of treatment. The reports are sent to the local health authorities. In principle, if a practice is found not to live up to the standards set for particular treatments, the authorities may submit it to further evaluation, but in reality the consequences of the NHS requests for the GPs are that the British GPs produce statistical data, which they can use as an occasion for discussions on how things are going in the practice. For instance, they can physically see how well/badly they monitor their heart patients. They may discover that 63 of a practice's patients have a heart disease, that 35 of these are men and 28 women, that 22 per cent of these heart patients are smokers, that 3 per cent of them have not had a blood pressure report recently, that 35 per cent of them are being treated with beta blockers etc.[14]

To produce such detailed information on practice performances, one would perhaps expect that the British GPs were very concerned with finding 'the right code'. This, however, was not the case. Instead, the GPs I talked to saw precision as something relative to the purpose of the code's use; they would be more concerned with coding for the NHS than with coding in general.

[13] At the time of fieldwork the 5 areas were: care for the elderly, diabetes, asthma, heart disease and mental care.
[14] The figures are derived from an audit report shown to me by one of the GPs I interviewed.

The British GPs in my study generally had a positive attitude to coding, firstly, because they knew the purpose of the coding. Moreover other staff, e.g. practice managers, often carried out the extra work of making audit reports for the NHS. Secondly, inconsistencies and contradictions in coding could be weeded out afterwards with programs meant for this.
Does this mean that the British GPs do not experience any dilemmas in relation to the coding? To make the code a well-working vehicle the GPs engaged in discussions about what would make up 'good data sets' and 'good data quality' inside the practice and in the primary care groups/trusts. Apart from the time it would take to participate in such meetings with other practitioners, the GPs also experienced a dilemma in balancing the coding for NHS with practicing acute medicine.

> **Dr. S:** "You can't do it all equally well and that is the problem. You must do diabetes well, you must do elderly care well, or psychiatry. They [the NHS] are not generalists and they don't understand general care. That's always the dilemma, I think, that we have ten minutes for an appointment if you are lucky. This morning, for example, I had a woman coming in, who is overdue for her angina check up, so I needed to do a blood pressure, make sure she is still taking her aspirin, check that her cholesterol is up to date, and that she is not having any problems taking her statins. But what she actually wanted was to talk about her daughter, who is causing her major grief at the moment. So the dilemma is to deliver health care, which is different from traditional general practice, and not just respond to peoples needs. But they still have the needs, so one has to try and condense all that into ten minutes. It is not very easy."
>
> (Interview with British GP, 2001)

The tension expressed here is not the tension between coding for primary and for secondary purposes, but rather the dilemma of doing the work that coding for secondary purposes carries with it. This work is meant to heighten the quality of care, but is mainly experienced as fitting extra tasks into the consultation's 10 minutes.

Before moving to the more general discussion on the dilemmas of the production of codes, let me sum up the British case in relation to the question of how the code is made to work inside the practice and as a vehicle for transporting clinical information outside of the practice. Above we saw how the GPs would carry out work to make the classification less fine-meshed. Moreover, to still be able to use the 'bundled' data to make audit reports for the NHS, they would have to 'unpack' this data again through their participation in data-collection projects and through discussions with colleagues from primary care groups/trusts. Even though this work is carried out after the coding has been done, there is a dilemma related to the coding. The dilemma

is between using the input from codes to give better care to chronic patients, while doing all the other tasks usually done by GPs such as caring for the acute patients.

The dilemmas of coding

The years since 1991 have seen a steadily increasing interest in the production and use of codes and an increasing wish to use routinely collected data for secondary purposes. Consequently, concepts such as validity, reliability, completeness, and accuracy have been subject for discussion (Pringle et al. 1995, Nilsson et al. 2000, Hassey et al. 2001). Far too seldom, however, are coded data seen as representations that are closely linked to the context of their production. Pringle et al. (1995) point out that, for instance, clinical data bases in use in general practice are often incomplete and incoherent, because GPs only record the data that is useful for their own consultation work. According to Pringle et al., this makes it impossible for researchers outside general practice (for instance epidemiologists) to use EPR data for research, and they conclude that data can be used only if it is accurate and complete. Since Pringle wrote his article in 1995, GPs have become increasingly aware of how to use data for secondary purposes as is shown in this chapter. The chapter, however, has also shown how for the GPs to find the right code it is essential that a framing exists in relation to which the data can be deemed accurate.

The examples above demonstrate that the ambitions of producing codes that accurately and completely represent GP work on a general level must be modified. Coding may have several overall objectives, but for a code to be 'the right one' there must basically be a purpose that is relevant at the moment information is registered. The idea of an objective and unambiguously correct code is an illusion, as the correctness of the code is relative to its purpose (see van der Lei 1991).

It is therefore not possible to collect precise and accurate data unless this has a specific goal defined in advance. But the examples from the practices show more than that, as they help us to realize that making a code 'the right code' demands extra work. The descriptions from the Dutch, British, and Danish practices also show that there are several dilemmas connected with coding, which cannot be resolved merely by assigning GPs limited coding tasks. Even for the British GPs, who followed the NHS requests for coding there were conflicting interests between the long-term objectives and the consultation's preoccupation with the here and now.

To make the codes work (for primary care as well as for secondary purposes) the GPs experienced different dilemmas. The Danish GPs experienced the dilemma between living

up to the demands for both specificity and quantity in their coding. To resolve that dilemma the GPs chose to do without codes (or make it an individual choice) and to use large amounts of observation codes, so as to avoid 'fixing' a diagnosis too early. The fact that no purposes were defined for the coding and that they had no method to transform observational codes once the data had been recorded, made them experience coding primarily as a burden rather than a support in their daily work. For the Dutch GPs, the dilemma consisted in extending the use of the EPR through coding to also collect data for research projects and use additional programmes (such as the vaccination programme) while experiencing an increased level of administration. The British GPs saw the code as a flexible tool. In spite of the obvious weaknesses of the Read classification, the GPs did not mind coding as long as purposes for the coding had been defined. They used the coding reports to gain new insights into their treatment of specific patient groups. Nevertheless, the British GPs, too, experienced a dilemma connected with having to produce electronic data about chronic conditions, which was sometimes done at the expense of time for the acute patients.

If we return to the notion of the code as an immutable mobile, which is simultaneously stable and subject to transformation when brought into contact with other actors, we may consider the dilemmas experienced by the GPs as resulting from the GPs efforts in dealing with this characteristic of the code. In spite of several differences between the practices, dealing with coding as a tool that helps create new overviews and structures inside the practice, while making possible the transportation of data into other contexts outside the practice, seems to be an ongoing effort in all practices. The dilemmas are slightly different, but are not resolved by defining purposes for the coding alone. Instead, the purposes defined should be seen as embedded in a large network of political ambition, organisational structures, and material infrastructure the elements of which play together dynamically. Purposes in themselves may thus as much be a cause for dilemmas when GPs are faced with the ambition of the authorities of 'acting at a distance' through the coding (as we saw in the British case).

Codes change GPs and vice versa

The focus in this chapter has been on coding and its consequences in practices in three different national contexts. Even though coding in the three countries differ in many ways, the common denominator is the fact that coded data is useless without the extra work done by GPs to make it meaningful. Even if the code may, in advance, be said to be part of an established classification hierarchy, its position in the classification system does not guarantee that the data are meaningful

when moved into other contexts (Berg and Goorman 1999). Codes and classification systems do not work like 'mincing machines´ which turn different kinds of information into uniform data. It takes work to make patient information useful for consultation work and for other purposes as well.

The discussion of the advantages and disadvantages of intensifying the use of diagnostic codes in general practice by means of EPR is not only about how, and how well, coding supports clinical work. It is about - or should be about - how it changes that work and the physicians' relation to and position in the world outside the practice. In their coding, GPs take up new activities and adopt new routines that have an impact on how they interact with the outside world and with their patients, while, at the same time, the code is being adapted to local conditions. Coding - whether viewed as difficult or useful extra work - must be seen as an activity that does not only connect individual practices to networks outside the practice, but as something that thoroughly changes the GP's role as health provider. The above descriptions of coding thus raise some normative questions of what ought to characterize the GP's position in relation to other actors. To what extent should clinical researchers and health authorities be allowed to define criteria for data quality in general practice? And should GPs be paid for producing certain sets of data?

A basic feature of the diagnostic code, as we have seen, is that it connects the 'inside' of the practice with its 'outside'. But since codes are also embedded in different kinds of network, this relation is neither unchanging nor unambiguous. Therefore, it does not look as if the dilemmas connected with coding can be resolved by defining one or several purposes for the coding, let alone by focusing on accuracy and reliability as universal qualities of the code. As we have seen, accuracy and reliability are not bound to be the result of coding.

As codes connect GPs with a larger network of colleagues, health authorities, researchers and politicians, it must be essential that GPs are involved in defining what questions they would like to see answered in relation to their specific patient populations. The purpose of this is not participation for participation's own sake, but should be done to help GPs organize their work in a way to make the coding possible, and to prevent that physicians spend time on useless coding of data.

Increased attention to the ways in which codes may work as immutable mobiles that connect various actors in- and outside the practice in new ways and increased attention to how codes, classifications and GPs work together, may change how we see coding. From being a

question of coding for the sake of standardizing all the information in an EPR it may become a question of how GPs and actors external to the clinic acquire surprising new insights about general practice work and the object for this work, the patients. Perhaps special 'coding networks' could be established to develop strategies for the use of codes and to formulate relevant research topics. Such networks would not change the fact that coding implies dilemmas for the GPs, but they might heighten the data quality on specific areas without at the same time turning consultations into a vain production of data.

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Appendix C

Winthereik, B. R., I. van der Ploeg, and M. Berg:

"Accountability and Autonomy in GP Work: Creating Auditable Practices through means of Information Technology"
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Accountability and Autonomy in GP Work

Creating auditable practices through means of information technology

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Abstract

Health care ICT's such as electronic patient records (EPR) are increasingly being used to produce accountability among general physicians in relation to health authorities. The aim is to stimulate physicians to carry out more complete registration, which will allow outside actors to better evaluate GPs' work. This paper explores the relationship between requests for increased accountability and enacting professional autonomy. By means of description from fieldwork and interviews in UK GP clinics, the paper demonstrates how requests to become 'account-able' (i.e. able to give accounts of what they do) carve out a space for new types of professional and clinical autonomy. In conclusion it is argued that accountability and autonomy are co-produced along with new dilemmas for the GPs. The paper's main contribution is to point to some of those dilemmas and to show how the 'effects' of audit are highly unpredictable.

Keywords

Accountability, autonomy, GP practice, EPR, audit, self-management, ethnography.

Introduction

The case about the drug 'slim-be' had been on the Danish news for some weeks already. A journalist from a consumers' magazine had discovered some suspicious connections between heart attacks and bleeding suffered by patients who were taking 'slim-be' and private economic

interests. By means of advertisements the journalist had searched for patients who had been taking 'slim-be' and experienced side effects. Among the people who contacted the journalist were parents who had lost their 18-year old daughter seven years earlier. The advertisement had reinforced their suspicion that there was a connection between the drug and their daughter's death.

The story hit the news. The house of the dead girl's GP was shown on prime time news. The story offered to the viewers was about the GP not having submitted information about the death to the relevant authorities. It was suggested that the reason for this was that the GP had been working for the pharmaceutical company that produced 'slim-be'. The GP had not wanted to acknowledge the relation between 'slim-be' and the girl's death, the story went, as she had aimed to produce 'successful research results' for the producer of the drug. As the GP had refused to disclose information from the girl's medical record to the parents, and, moreover, had not wanted to present her views on the case, the program strongly insinuated that she had something to hide. In our conversation with the GP she explained that she had chosen not to argue her case to the journalist because she was afraid that he would twist her story. Moreover, she felt that there was no need to give a public account, as she had been completely candid with the girl's parents all along. It was the GP's impression that during their numerous discussions they had reached an understanding that there was no connection between the drug and the girl's death.

The case reached government level. At first the drug was withdrawn from the market; later, when the media storm had subsided, it was allowed for the GPs to prescribe the drug with certain restrictions. And yet, while the media was still discussing the 'slim-be' case, the minister of health publicly asked: "How can we make sure that the GPs only prescribe the medication that patients need[i]?" His answer to the question was to increase accountability for GPs. One way of doing this, he suggested, would be to introduce electronic medication profiles for all patients[ii]. Further, he argued that the GPs' should be obliged to carry out more reports on encountered side effects by patients. More complete registration, he suggested, will make government agencies

better able to unravel whether GPs comply with medical guidelines or not, and further the quality of the health care given.

As resources are scarce and demands increasing, governments wish to have value for money and better possibilities of setting priorities in health care. Ideas and management tools from the area of public management (New Public Management) are, thus, being promoted in the Western health services (Strong 1990). NPM argues for less centralized governance in relation to local practices by the introduction of tools to increase external accountability.

In the wake of this development a number of new keywords and concepts have become part of everyday practice in various fields including the health care sectors. Terms such as 'evidence-based medicine', 'best practice', 'bench-marking', 'transparency', and 'clinical governance' link arguments for high quality care and more economical clinical practices with arguments of scientific progress and objectivity. The arguments for more intensive registration and account-giving practice are convincing; it is hard to criticize quests for openness, access and responsibility (Strathern 2000). However, actually creating unambiguous terms for doctors' work comparable to evidence-based standards seems to be a difficult task (Armstrong 2002, Berg and Timmermans in press). This paper explores how accountability is being performed in GP practice and how this performance relates to professional and clinical autonomy in a GP clinic.[iii]

The story above shows a GP who sought to account for her role in the care of a patient who died, by talking openly and on more than one occasion to the patient's relatives. She thus enacted a form of accountability that remained within the realm of the private confidentiality relationship with the directly concerned. Interestingly, the story shows how this type of account-giving clashed with another one that stresses an openness of GP practice to the public as well as one of scientific or professional accountability (e.g. keeping ones practice up to date with the latest developments by participating in pharmaceutical research). The GPs' decision not to report the death fed the suspicion that a cover-up for adverse reaction to medication had been revealed.

Subsequently - and most relevant to the topic of this paper - the Minister's reaction shows how public concern about the quality of primary care is translated into a call for new IT-based tools for systematic registration.

In the public re-framing of the 'slim-be' case the Minister presents it as a case about accountability. Thereby the case becomes a vehicle for his suggestion to intensify the use of electronic accounting tools in GP practice to support the disclosure of confidential information. When the case is constructed as being about accountability, and not for example about the media's role in defining central topics in parliamentary politics, a solution like electronic medication profiles seems 'natural'.

The 'slim-be' case can also be seen as a response to what are generally seen as the two greatest problems of health services in Europe. First, the financial problems in health care. A 'graying' population will put pressure on health care expenditure, and the bill must be shouldered by a decreasing number of taxpayers (The Economist, 29.06.00). In order to safeguard the quality of future health care governments are searching for ways to optimize the use of resources. Second, the problem of patient safety puts increasing demand on health authorities to diminish the risks connected to hospitalization as well as to medical treatment.[iv] In the quest for more effective health services that take better care of patients, increasing accountability seems to offer ways of avoiding local idiosyncrasies and opacity in medical work.

In this paper we are concerned with the issue of accountability in general, and with accountability in primary care work in particular. There are several reasons for this interest. First of all, GPs have traditionally been considered, and to a large extent consider themselves, as autonomous care providers. Financially they are 'their own masters'; GP practices can be compared to small-sized firms, who administer their own finances.[v] GPs, furthermore, perceive themselves as generally enjoying much freedom with respect to local control over routine work and decisions related to the work of treating patients.

Second, the issue of accountability in GP work is relevant because GPs present a noticeable ambivalence in relation to demonstrating that they live up to certain criteria for 'best practice'. Like is the case in relation to accountability-issues in higher education, GPs are both deploying, and being skeptical about deploying, tools that make their practice visible to external actors (Strathern 2000b). We are interested in this obvious paradoxical aspect of external accountability: on the one hand GPs see performance indicators as highly constructed and artificial. On the other hand they have a desire to use these indicators, however arbitrary they may be, in order to demonstrate to others that they live up to the indicators for quality embedded in the accountability tools and thus act as good health care professionals.

A third reason for our interest is that in spite of the fact that GPs in Western Europe have used electronic tools for registration for more than a decade now, there is a feeling among the health authorities that general practice is a black box ("It's hard to find good statistics that describe what GPs do. The audits they make describe the outcome, but not how they get there", says a clinical author of a UK decision-support system, personal comm.). This makes GPs' practices prone to initiatives that focus on accountability issues. However, opening a black box in one area may result in the creation of new 'black boxes' elsewhere; it is therefore relevant to study how accountability is 'done' in practice.

Methods

The argument in this paper builds on the analysis of data generated during ethnographic fieldwork in five GP practices. The fieldwork periods were of various lengths (from one day to three weeks) and carried out in the Netherlands, Denmark and the UK. Observations in the clinics were carried out in the consultation room as well as elsewhere in the clinics (e.g. in the reception area). Interviews were carried out with GPs and other staff and with GPs in clinics external to the fieldwork sites. The fieldworker used what could jointly be called 'ethnographic techniques'

(participant observation and semi-structured interviews) as a way of gaining access to parts of the GP practice that is usually hidden from more structured forms of data generation (e.g. surveys). Doing fieldwork in several countries does not primarily work to make cross-national comparisons of various forms of accountability. Instead, we started out with a general question (How does the use of an EPR transform work in GP clinics?) and on the basis of fieldwork we identified a number of themes that seemed pertinent for the way work was performed in the clinics we studied. Data from one setting was subsequently used to inform the fieldwork in a different context, the difference between contexts becoming a valuable tool for the fieldworker for distancing herself from the 'taken-for-grantedness' of the way the EPR was part of the work in the different settings. We thus consider data generation in different national contexts as a tool, which the fieldworker could use to gradually sharpen the questions she asked (Winthereik 2002). In the remaining part of the paper we will leave the Danish context with which we started out, and focus on practice in UK clinics in relation to accountability and autonomy. We argue that demonstrating accountability by use of information technologies carries with it transformations of the working relations within a GP clinic and changes the GP's positions in the broader network of which s/he forms part.

Two Approaches to the Study of Accountability

A large body of literature exists on the issue of accountability. One group of authors presents a sociologically oriented perspective on accountability. These authors roughly focus on the 'dehumanizing' effects of audit and increased demands for accountability, and criticize the tools, which are used to measure performance within a specific area. The tools are taken to be problematic because they are vehicles for new oppressive forms of management. An example of this approach is Shore and Wright (2000). According to these authors audit within higher education are often presented as liberating for the practitioners involved, because they no longer have to subject themselves to external control procedures, but is in fact constraining for the

practitioners, who invest much time in reporting (Shore and Wright 2000). The authors question whether audit really improves the quality of the work carried out within the universities. Instead, they argue, audit is a technique that redefines work at universities in neo-liberal terms by re-inventing them as enterprises (ibid. pg. 67).

In this they follow Power (1997), who argues that audit makes practitioners carry out 'second order operations' instead of what is supposedly the core task of an organization: education in the case of the universities and caring for and treating patients in the case of the health care sectors. Doing audit thus becomes a demonstration that one lives up to the standards of measuring what one does, but audit has no real effect on the quality of the end result as the measuring activity gains its own dynamics and becomes self-fulfilling. He claims, "what is being assured is the quality of the control systems rather than the quality of first order operations" (ibid. pg. 73). In his critique of the 'audit explosion' Power argues that audit constitutes a form of 'learned ignorance', which produces a kind of comfort that is not grounded in any practical reality (ibid., 123).

Wiener likewise criticizes that tools for measuring the outcome of work in a hospital have been developed without an understanding of the activities that go on inside the hospital (Wiener 2000). She shows how much work goes into preparing for surveys carried out by an external visitation committee at a hospital. Wiener uses theatre metaphors (script, players, cast, rehearsal, performance) to describe how the hospital setting is being staged in a specific way prior to the visitation, and argues that professionals need to develop 'defensive strategies' (Wiener 2000, 183), which consume precious resources, to make themselves accountable in a way that fits into the criteria of the surveys.

In contrast to these authors, who see audit as a managerial strategy that primarily masks power relations and wishes to introduce neo-liberal governance, a second group of authors consider audit (and the work that goes ahead, such as classification work) as something that may transform work in an organization in ways that may be experienced as productive by the practitioners involved. Demands for accountability, they argue, can be made part of a professionalizing

strategy, which may transform power relations in unexpected ways. An example of this is Timmermans and Berg's study of insurance physicians' use of procedural guidelines (in press). The authors argue that while demonstrating accountability opens up for critique and suggestions/demands for change in an organization, it also helps the physicians protect their profession's jurisdiction. Timmermans and Berg also describe how a nursing classification system becomes an occasion for the nurses to preserve their clinical autonomy (ibid).

Attempts to create accountability through registration thus change physicians'/nurses' work. They increasingly have to walk a delicate line between visibility and invisibility, but whether this is experienced as constraining or liberating is not clear-cut in advance (see also Wilson 2002, Timmermans, Bowker & Star 1998, Bowker and Star 1999). Increasing demands for accountability is not problematic with reference to the point that registrations for accountability purposes represent work in an 'incomplete' way. Instead, visibility in some areas may carry with it invisibility in other areas (Timmermans, Bowker & Star 1998, 221). To these authors a researcher's task is to study how representations of work happen and how they are 'translated' across contexts. Making work visible and practitioners 'accountable' are thus seen as achievements, not inevitable implications of formalizing data entry and retrieval.

Common for the two perspectives outlined above is that they see audit and demands for accountability as a form of self-management that has implications for local work practices. According to the first set of authors, practitioners, who do audit, internalize the indicators on the basis of which they are measured, and their capacity for self-inspection increases. This internalization shifts their focus away from their 'real' work. According to the second group, demands for accountability have unintended effects and may become an occasion for professional and organizational learning.

In this paper we likewise view current accountability practices as a form of self-management, and focus on some of the unintended effects that accountability has in primary care work. We first look at how GPs are ambivalent about requests to account for their work by electronic means.

Next we explore how accountability leads to new forms of clinical and professional autonomy for GPs.[vi] We are particularly interested in the role of an EPR in the 'opening up' of GPs practice for outside scrutiny. By taking a closer look at the local contingencies involved in improving accountability by means of more complete registration, we show how audit and accountability – next to making possible new forms of autonomy – 1) transform what GPs see as their area of expertise and 2) produce new stratifications within the GP community. We thus argue that accountability and autonomy should not be seen as external to each other (more accountability results in less possibilities of exercising autonomy). Instead, accountability and autonomy are mutually constructed in practice.

Accountability and Ambivalence

In this section we describe a number of GPs' ambivalences towards increased reporting for accountability purposes. On the one hand, the GPs in our study did not welcome the requests to increase accountability by means of increased registration; on the other hand they sometimes found the audit reports useful for a different understanding of their work. GPs often considered it as intrusive to have somebody from outside the clinic evaluate their working habits, however, in our interviews reservations were seldom expressed in terms of fear of loosing autonomy. Reservations were articulated in more ambiguous terms. A GP for example describes how on the one hand he feels GPs are increasingly being put under surveillance, while he also enjoys the element of competition in demonstrating that he lives up to minimum standards for 'best practice'.

GP: "We have the external Primary Care Groups/Trusts auditing and comparing practices. There is a bit of Big Brother there, and then again not because they are much more gentle and

there is a bit of pride in it; we ought to be doing as well as if not better than the rest. Also within the practice there is a desire to do things well" (Dr. C, 02.02).

In this quote, external auditing is simultaneously considered an undesirable form of surveillance *and* a direct stimulant to a positive form of competitiveness in the form of the 'desire to do things well within the practice'. In describing this, the GP introduces two networks of actors that are important when he produces accounts about his work on the basis of standardized data. The first is a group of financially interdependent GP practices (Primary Care Groups/Trusts); the second is a group of colleagues within the clinic itself. The GP connects no clear-cut positive/negative feelings to the issue of performing accountability towards external actors. Even though it is associated with the controlling eye of Big Brother 'there is a bit of pride in' showing what they do in the practice. This relates to the Foucauldian notion of the Panopticon; accounting for one's actions 'works' because the idea of being monitored disciplines the GPs. The internalization of the outside gaze on their work makes them feel part of a competition that is partly an imaginary but which simultaneously informs their relation to colleagues in neighboring practices.
Some GPs are simply against auditing. They find that data produced in the consultation make little or no sense when taken out of this context, and claim that evaluations in the form of auditing may have harmful effects on the on-going work in the clinic. Therefore, in the opinion of the GP quoted next, figures produced in the clinic should not be shown to anybody outside the practice 'as the only measure of performance'. He argues that measuring whether one lives up to health authorities' standards and activities 'within the house' should be kept separate:

"Most of what we do on the computer is to monitor performance in quite narrow ways. It is almost always to produce numbers. And I see no problem of using that information as part of an assessment. It is always useful to have some numbers. My concern is that sometimes people who use the figures use them as the only measure of performance and don't understand the clinical

context. I am in favor of the audits that we do in the practice here because we all understand what the information means. We understand what the weakness is of the system. We understand the circumstances in which we record stuff and in which we don't. Within the house it is better… we have an understanding. My real fear is that the numbers are interpreted outside the house in an inappropriate way. In a way that is unhealthy for the individual patient" (Dr. F, 02.03).

When 'outsiders' interpret the meaning of the data produced in his practice the GP quoted begins to worry. He fears that 'producing numbers' will influence the way he gives care to patients. This fear of being dependent on evaluations from the outside is not expressed *directly* in terms of not being able to remain 'one's own boss'. It is instead seen as having harmful consequences for patients, who will suffer if finances are taken away from the practice.

But is it really audit, that is the 'real fear' of this GP? Or is his fear that somebody else turns the audits into the *only* indicator of quality?[vii] The ambivalence in relation to registration presented by the GP resembles the ambivalence presented by nurses when asked to classify their work in standard terms. Star has coined this ambiguity: "[L]eave the work tacit, and it fades into the wallpaper (…). Make it explicit, and it will become a target for surveillance" (Star 2002). Like the nurses in her study were forced to walk an increasingly narrow line between invisibility and visibility, this GP anticipates a situation in which he does not know what the indicators for evaluation are.

Through the quotes we thus gain some insights in relation to how GPs experience the demands for external accountability. First, they find producing standardized EPRs and audit to be fun and a kind of competition, which can be useful. But at the same time they only find it useful as *one* kind of evaluation and prefer to interpret the numbers themselves. It thus seems unwarranted to think that GP resistance towards using electronic tools for increasing public account-giving is simply a question of loosing autonomy, or that there is a straightforward relationship between a growing number of accountability procedures and loss of autonomy. In the following section we show by

means of example, how an 'accountable' GP and specific forms of autonomy are mutually constructed in practice.

Towards a focus on chronic disease management

Among the countries we studied, audit as a routine activity is mostly carried out in the UK. In the UK, the National Health Services (NHS) have defined a number of disease areas of special interest and GPs are requested to run audits by means of indicators and audit criteria developed by the NHS.[viii] The NHS attempt to introduce a higher degree of clinical governance and self-management in the clinics is the primary method to reach the goal of higher quality in the clinical work. The intention is that internal and external audit should be closely related in practice, so that measuring quality is not felt as a burden, but increases practitioners' reflexivity and stimulates professional learning.

> The clinical audit criteria are (…) intended to be used by professional organizations as they develop *new and more effective methods of self-regulation and continuing professional development*. Their application of the clinical audit criteria is intended to encourage the development of more national audits and to improve the quality and usefulness of clinical audit throughout the NHS (http://www.doh.gov.uk/nsf/chdexecsum.htm#clinical) (authors' emphasis).

With this attempt the NHS points at 'professional *organizations*' as the object of self-regulation, not professionals individually. The proposition is that if individual procedures and methods are open to scrutiny then the organization as a whole is open to improvement. But even though the aim is not the improvement of individual practices these practices can be sanctioned financially and lose their rights to train registrars if they produce 'bad' reports or do not audit activity in the clinic at all. It is thus crucial for the health authorities that 'good' standardized data is produced

during the consultation when GPs see patients. When GPs use the EPR for audit monitoring chronic diseases becomes part of everyday consultation work, and is no longer seen as a special endeavor.

Diabetes patients form a group of patients, whose symptoms can be significantly bettered, and deterioration prevented or slowed down, if they are subjected to regular control and monitoring. Likewise, patients with a family history of heart disease can be monitored relatively easily and with successful results if the cholesterol in their blood is routinely measured. Diabetes and heart disease, consequently, have been chosen as two of the NHS' areas of special attention. In spite of various ways of stimulating a GP to pay attention to these areas (letters, publications), it may be difficult for a GP to remember to carry out the relevant examinations and fill in the results while seeing the patient.

For this purpose GPs can 'ask' the EPR to prompt them to carry out certain examinations whenever they see a (diabetic/heart disease) patient. Carrying out routine measurements and filling in the results consequently becomes a central part of the consultation, and preventive medicine and chronic disease management are no longer done only when there is a bit of extra time (which there never is). Every three months the GPs produce audit reports on the basis of figures in their EPR. These reports are used for discussions internally in the clinic and are sent to the health authorities.

What we see here is that the prompt stimulates GPs to carry out certain measurements and fill in the results in the EPR. The figures can later be used to generate audit reports for internal and external purposes. The prompt reminds the GP of things that s/he 'ought' to do and creates the possibility for health authorities to hold GPs accountable for their actions, because they are reminded to register more information than they would have done without the reminder (e.g. patients' cholesterol level, blood pressure, BMI etc.). The prompt can be seen as making GP work visible to the NHS while simultaneously making the politics of the NHS visible to the GP in the sense that it is made visible to the GP what s/he ought to do.

"The computer reminds me that I ought to be doing certain things. The more you know a patient the more you start assuming things, but with the computer it stands out when you haven't done the tests you ought to do, and if there is a reminder for a repeat prescription. If we have done it properly it's just there on the screen: that man with the angina had his cholesterol done and I can re-prescribe the statin" (Dr. C, 02.02).

When data this way is routinely collected and filtered through an audit program GPs are able to demonstrate to the NHS that they do carry out requested activities (such as carrying out routine measurements of cholesterol level in heart disease patients). Registration of care given to chronic patients, for the NHS, thus serves the double purpose of caring better for these patients *and* opening the black box of GP practice. In this context, 'better care' means care that is evidence-based, but as we intend to show in the following, realizing those visions of 'better care' implies new autonomous spaces for GPs along with new uncertainties and opacities as what used to be considered 'special cases' increasingly becomes part of 'normal' everyday work.

Accountability and Clinical Autonomy

Having to perform particular examinations and fill in the results does not seem to threaten the GP's status as an autonomous professional in the clinical setting. Instead, it creates an occasion to add structure to the consultation with patients, whose agenda is not clear or who have psychosomatic complaints (the ones referred to as 'crocks' in (Becker 1993)). In a situation where a patient presents complaints with vague or no pathological explanations GPs may use the reminder prompt to legitimize that the consultation is centered on his agenda next to the patient's. The prompt thus enables a busy GP to justify introducing his agenda next to the patient's and allows him to work with chronic as well as acute conditions within the timeframe of a single consultation. This later enables him to increasingly consult the EPR if he misses some

information about a patient (instead of asking the patient directly). The EPR thus acquires a rather central role in the communication with a patient as it can sometimes give answers, which the patient is unable to give due to its ability to make certain links between a patient's current symptoms and past history.

An example of the way in which an EPR can be used for such purposes and perhaps even reinforce unequal power relations between a patient and the GP is the risk profile. Risk profiles are used to calculate a patient's risk of getting a particular disease, e.g. a heart attack. The calculations are done on the basis of coded data in the patient's EPR, and presented as graphics and text. The risk profile suggests treatment according to standard medical guidelines. The idea is that agreements should be made between the patient and the GP about how to minimize what is perceived as a risky condition or behavior. The risk profile presents suggestions about how this goal can be reached, e.g. by giving advice about diet and exercise. This way the risk profile demonstrates relations to a patient between life style and possible impact of this life style on the patient's health.[ix]

Making a risk profile and presenting it to a patient stages the GP as an expert. An interviewee coined it this way: *' [The risk profile] makes you reliable*'. He subsequently explained how the risk profiles would *both* enable him to check whether he would still be 'doing things right' after 20 years of practice, and enable him to capitalize on the importance of a particular treatment/life style change in relation to a patient. The risk profile establishes the authority of the GP as it allows him or her to perform as a reliable and trustworthy representative for the standard advice given by the guidelines. Moreover, the risk profile stages the GP as autonomous in the sense that it may place a GP in a position, where s/he is allowed (because of the authority acquired by using a guideline) to tell a patient to do something with uncertain effects (the treatment may have worked in an evidence-based study, but it may not work for this particular patient).

Some GPs chose to deviate from the standard, evidence-based advice, and act on the basis of their own experience. Armstrong has shown how this happens in the case of prescribing medication,

where GPs follow their own 'trials' next to the evidence-based advice (Armstrong 2002). What happens, thus, is that the space for decision-making gets extended: the GP can follow the standard guidelines or follow his/her own experience with a drug. In both cases the GP acts on the basis of a certain expertise and is staged as an expert in relation to the patient.

Increased requests for accountability not only perform the GP-as-expert. Instead, while new expert-positions appear, uneasiness or ambivalence can be traced as well. The GP, quoted below, for example distinguishes between expertises in different kinds of care, and defines what he sees as *his* area of expertise.

"So it's, well, [the prompt] helps me because I am not very good at doing the routine chronic management, I am much better in dealing with the person and not dealing with the routine, and so it helps me" (Dr.C 02.02).

The fact that this GP explicitly identifies and ranks different kinds of care (acute and chronic care), points to the existence of dilemmas in actually balancing various kinds of care in practice. Such dilemmas are described clearly in an interview with a different GP.

"You must do diabetes well, you must do elderly care well, or psychiatry. Authorities are not generalists and they don't understand that we are, and that's always the dilemma in this country, I think, that we have ten minutes for an appointment if you are lucky. So for example this morning I had a woman coming in, who is overdue for her angina check up, so I needed to do a blood pressure, make sure she is still taking her aspirin, check that her cholesterol is up to date, and that she is not having a problem taking statins, and she actually wanted to talk about her daughter, who is causing her major grief at the moment. So that is the dilemma between delivering health care, which is different from traditional general practice, which is about just

responding to peoples needs, but they still have them and one has to condense all that into ten minutes, which is not very easy and that, I think, is a problem" (Dr. M. 02.01).

This GP feels uneasy about having to respond to different needs within the timeframe of a single consultation. On the one hand he finds chronic disease management useful, and he sees the importance of standardized registration, on the other hand, he feels he should primarily respond to the issues of immediate concern for the patient.

Another GP acknowledges the need for standardized data entry as well, but argues that sometimes GPs must 'side' with patients in front of them. They must listen to the acute concerns and forget about the EPR and complete registration for a while.

"A code is only a helpful mean, what is important is the contact with your patients. I will tell you a metaphor. A plane crashed in the Alps. When the black box was found, it turned out that the altimeter had been broken.. a pilot can look at the instrument, but if he can not look outside at the same time, he might fly into a mountain wall.. the instrument in itself is not very good. So the computer and the code are helpful means, but the doctor remains responsible for the patient sitting before him. He cannot trust the computer alone so if you miss data: ask the patient" (Dr. B. 11.01)

To this GP a focus on electronic registration can become a way of only looking 'inside' the plane instead of 'outside' where the patient is located. The 'inside' to this GP is the evidence-based 'medical world', where complaint and diagnosis fit nicely together. Sometimes, however, the GP has patients, who do not fit into that category, and then, according to this GP, a GP must be able to disregard the registration.

So to sum up, increased requests for accountability in some instances supports the GP in performing as an expert, who is backed by evidence-based standards, and whose space for clinical

decision-making is extended by the possibility of adhering to or deviating from the guideline. In other instances, the request to practice evidence-based medicine is brought into conflict with another kind of expertise, that of treating acute conditions. This means that many of the patients that come to be treated in general practice would come in vain if the GP would blindly follow the tool. And this is paradoxical when one recalls that the argument for 'more complete' registration and accountability exactly was to increase the quality of the care given. This bettered quality, thus, only applies to some pathological conditions, not to all conditions a patient may present in general practice

But as we have seen the GP is no simple victim of the tool. Instead, he or she has ways of dealing with the increased pressure on the consultation time. One of these is to delegate tasks to other professionals, e.g. practice nurses. Such new delegations means that more triage is done, so that GPs do not spend time seeing patients without any 'real' pathology. Consequently, the GP's area of responsibility changes and he or she becomes more of a specialist/consultant (see also Charles-Jones et al 2003). Just as demonstrating accountability has consequences for the GP's position inside the clinic, it also has consequences for his or her position in professional networks outside the clinic. In the next section we discuss how.

Accountability and Professional Autonomy

Above we have argued that GPs do not only feel constrained by adhering to prompts and reporting to the NHS, even though it takes time and effort to make good audits. In fact the GPs that were interviewed and observed as part of this study often used the prompts and the audit programs to generate statistics on issues of interest to them. Instead of merely producing the audit reports that they were requested to produce by the NHS, the GPs put much effort in measuring their performances within other areas. Below, a GP explains how he and some colleagues in his Primary Care Group attempt to formalize all available data on osteoporosis patients:[x]

"With the osteoporosis project we are using it [the EPR] because we are looking at people with risk of osteoporosis in the age group of 60-80. Any women between those ages are being searched for electronically and get a letter. We ask them whether they have any risk factors. Some of the risk factors we can search on the computer but we also need the patients to identify themselves. The nurse organizes the project. She has all the patients' information and the patients get an invitation for a scan, she has everything on her computer. If they need any further investigations, we have a protocol for the general practices. What we now have, at the end of the year, are records of women with osteoporosis, what tests they have done, and what the results are. Then we can go back and look for the practice records to see if all the records have been updated and if the patients had the appropriate treatment" (Dr. F. 02.02).

This GP describes how in his particular PCG[xi] some GPs have taken the initiative to use their databases to get a better overview of all the osteoporosis patients in that particular group. The GPs thus make an effort to turn the EPR into a tool apt for audit purposes within several other areas than the ones requested by the authorities. While doing this they develop particular expertise within specific areas in the sense that they can go back to the audit report and ask: what did we do? How can we do better?

But why take the trouble? One possible explanation for this could be that GPs/local PCGs want to position themselves 'one step ahead' the health authorities. They use data to cover 'holes' in the information in their databases about a particular condition, so that they are 'ready' if an audit result on this particular area is later requested by the authorities. This, however, is not a likely explanation as it is far too time-consuming to create such records and not even be sure the information is of any use.

A second and more probable explanation is that the additional audits work to create new relationships with other external actors, e.g. pharmaceutical companies, and thus allow GPs to position themselves in new networks. These companies pay the practices to provide specific types

of information, which they can use for the development of new medication. The GPs in turn generate a firm knowledge base in one or more areas. Thereby they establish and maintain professional autonomy in relation to other specialties and in relation to colleagues. GPs also seem to have a lot of fun improving their own work this way.

"The project is evidence based. What percentage has osteoporosis? What risk factors are the most predictive? These questions we hope to answer. What we hope is that by each test a printout can be produced of every patient who has been into the project. We hope that every practice in this project downloads that information from our site on the web. So they have an up-to-date EPR. And then that EPR will be a meaningful audit tool" (Dr. F, 02.02).

So even though demands for 'more complete' EPRs make GPs carry out tasks requested 'from above', this does not mean that they are constrained to do only this. On the contrary, the tools, which GPs use to do audit, enable them to build up expertise within other areas and engage in new networks (see also Singleton and Michael 1993, who argue that GPs' participation in specific networks makes them autonomous in relation to others). When audit tools are used to set up projects like the one described above, new centers of accountability are constructed along with new connections between local GPs practices and Primary Care Groups. This may be part of an on-going stratification/distribution of work within the GP community into GPs who bootstrap technology to develop special expertise, and GPs who provide other GPs with information.

Conclusion: Accountability and GP Autonomy as Mutually Constructed

In this paper we have been concerned with the relation between requests for accountability and with the performance of the GP as an 'accountable' subject. We showed how requests to generate audit reports in UK general practices, brought along subtle transformations of the doctor-patient relationship and of GPs' professional identities. By producing a standardized EPR that could be

used for audit purposes, GPs were staged as autonomous in different ways. First we showed how the prompt and the risk profile staged a GP, who was expert on (potential) chronic diseases and in making links between a patient's past and current health. We argued that the space for clinical decision-making was extended, but that in parallel to the production of new possibilities to perform autonomy, the GPs experienced that it was increasingly difficult to attend both patients with acute needs and patients with chronic diseases.

Second, we showed how the use of audit tools enabled the GPs to become part of new networks, whereby GPs' professional autonomy was strengthened. Through their participation in research projects some GPs were able to establish their practices as 'information centers' and thus perform themselves as researchers. This positioned other GPs as providers of standardized information to the first group. We argued that this division of work facilitated new stratification within the GP community in the sense that it enabled the first group of GPs to move away from the traditional role of being a generalist concerned with patients as psycho-social beings. They would instead increasingly inhabit positions as specialists/medical consultants.

Electronic accounting tools for general physicians thus seemed to imply something far more ambiguous than increasing external control and a loss of autonomy. Throughout this paper we demonstrated how audit requests transform GPs' work, extending the space for clinical and professional autonomy. By means of example we showed how various functionalities in an EPR would make GPs 'account-able' in very particular ways.

We found that GP autonomy, instead of being produced when a GP acted 'on his own', was established through the GPs' *connections* to other actors (human and technological); autonomy was thus produced in the different (accountability) networks of which the GPs were part, and did not follow from a situation in which the GP was 'free' or accountable to nobody. Studies from within the field of Science and Technology Studies, which emphasize the importance of relationality in order to define the cause and effect of a phenomenon, back this perspective. To

them, everything, and thus also autonomous action, achieves its form and identity as a result of the network in which it is located (see for example Latour 1994, Moser and Law 2001).

The effects of increased requests for accountability may thus be multiple. Therefore - returning to the case introduced in the beginning - it seems haphazard to construct an argument for new electronic forms of regulation around a single case in which it is not clear to anybody what has really happened. This points to some of the blind angles of the current 'accountability regime', for example failure to acknowledge the arbitrariness of some of the technological solutions suggested as ways of dealing with problems in medical work. At worst this failure shifts focus away from developments in the daily work that have profound implications for care given such as the ones we have described.

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Notes:

[i] www.ekstrabladet.dk 6. nov 2002.

[ii] A medication profile is registration of all patients' use of medication. The profile is intended to give any treating doctor an overview of a patient's medication. A doctor should be able to gain this overview at any time and without the patient's consent (which implies the existence of a database external to the practice) (Andersen 2003).

[iii] The term performance is here taken from a body of literature that focus on the constructed nature of various entities. The property of an 'accountable GP', thus, cannot be determined without knowledge of the particular setting, which such an entity passes through, or in which it performs (Berg and Mol 1998, Gomart in press)

[iv] As they have for example been described in the reports *To Err is Human* (2000) and *The Quality Chasm* (2001). In Denmark the National Council for Quality in Health Care (Danish: Det Nationale Råd for Kvalitetsudvikling i Sundhedsvæsenet) has published a report that outlines goals and initiatives in relation to patient safety until 2006 (*National strategi for kvalitetsudvikling i sundhedsvæsenet. Fælles mål og handleplan 2002-2006.* København: Sundhedsstyrelsen, 2002).

[v] There are of course a number of local differences in how the exact relation between individual clinics and the state is played out. In the Netherlands private health insurance companies for example play a bigger role than in Denmark and the UK because patients need to be insured either publicly or privately.

[vi] We distinguish between two kinds of autonomy: professional and clinical autonomy. Professional autonomy can be defined as the autonomy GPs experience in being part of the GP profession as a whole with respect to the way the profession is being run and looked at by others. Clinical autonomy refers to the freedom a practitioner experiences with respect to exercising control over routine work activities and decisions (Timmermans and Berg, in press).

[vii] The dilemma of using an EPR to produce data for accountability purposes described in the quote, is closely related to what Berg and Goorman explained as 'the (im)possibilities of the utilization of primary data for secondary purposes' (Berg and Goorman 1999 p.51). They argue that as data need a context to be meaningful, data taken out of the GPs EPR must be provided with new contexts. Data, in other words, do not carry the same meaning in different settings. Additional work therefore has to be carried out to make this data meaningful (see also Winthereik in press).

[viii] The five areas are mental health, asthma, chronic heart disease, diabetes and care for the elderly.

[ix] To get the very detailed information that is needed to produce 'good' risk profiles, i.e. profiles that 'talk' clearly about a patient's state of health, GPs code a patient's notes during consultation hours, but can also organize more systematic ways of generating data such as specialized 'clinics', where patients come for regular controls.

[x] The GPs interviewed all worked in computerised practices referred to by themselves as 'paper-light' practices. This meant that the GPs used a paper/based record as well as an EPR. All practices were allowed to train doctors, who wished to follow the specialization for general practice – they were thus 'training practices'. Doctors differed in their interest in general practice research, but mostly there would be one or two, who were paid to take an interest in audit procedures; the GP quoted first had such a status and would thus make sure his particular practice was producing good audit figures within areas that were collectively defined within the practice.

[xi] PCG stands for Primary Care Group and describes a unit comprised of a number of general practices. The PCG is accountable to a health authority under NHS. Its main functions are: *"to contribute to the health authority's Health Improvement Programme; to promote the health of the local population; to commission health services for the local population within the framework of the Health Improvement Programme*". (http://www.nhsia.nhs.uk/datastandards/pages/ddm12/entity/entity_PRIMARYCAREGROUP.htm)

Appendix D

Winthereik, B. R., A. de Bont and M. Berg:

"Accessing the World of Doctors and their Computers: 'Making Available' Objects of Study and the Research Site through Ethnographic Engagement"
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Accessing the world of doctors and their computers

‘Making available’ objects of study and the research site through ethnographic engagement

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Abstract

This paper reconsiders the issue of access to a field of study as a problem that fieldworkers have to solve *before* they start data generation. Access problems, instead of being seen as a troublesome period for the fieldworker, are turned into an issue of constructing the research site and an object of study. By means of example from fieldwork carried out in two general practices, this paper argues that gaining access must be seen as a process of negotiation in which researchers deal with resistances made by the object of study. Drawing on recent insights from the fields of Social Anthropology and Studies of Science and Technology (STS) the paper agues that negotiations for access form one way in which the researcher and an object of study – in this case general practitioners and their electronic patient records - are ‘made available’ to each other. Fieldwork methods are apt as entry point for ‘making available’ an object of study, because they allow for negotiations in the field that enable the researcher to change pre-set ideas and research questions.

Key words:

Electronic patient record (EPR), general practice, access, ethnographic fieldwork, resistance, Science and Technology Studies

Introduction

Ethnography in various forms is known and commonly used by information systems researchers. A practice perspective, like the one a fieldworker can obtain during ethnographic fieldwork, it has been argued, helps surface users' assumptions about the information systems they work with, and as a result can be used to inform information systems design (Blomberg, Giacomi et al. 1993; Button and Harper 1993; Luff, Hindmarsh et al. 2000). Fieldwork thus continues to be popular within IS research because it is seen as reaching the parts other methods cannot reach, e.g. users' point of view and the undertaking of invisible work. However, what ethnographic fieldwork can contribute remains under-explored within IS research (Forsythe 1999; Finken 2000; Bossen 2002). In this paper we would like to suggest new conceptual ground for thinking about fieldwork as more than an 'off-the-shelf' tool-kit. To do so we address issues of the relation between method and theoretical underpinnings and of the position of the fieldworker, who studies information systems in practice. We argue that fieldwork is useful, *not because it brings the researcher closer to the 'reality' of the object(s) of study, but because it allows for forms of empirical and analytical engagement, which may provide insights about the effects - intended and unintended - of the use of information technology.*

One of the issues relevant to (IS) researchers who conduct fieldwork is the issue of access. Access is generally considered a practical problem, which must be overcome by the fieldworker. How a fieldworker gains access to his/her site of study, however, has implications for data generation and is not merely about being physically present. Social anthropologists have dealt with this issue, arguing that access to the field and data generation happens in parallel. To them the field site does not exist prior to the fieldworker's engagement with it. Instead they talk about a co-construction of the field site by fieldworker, his/her informants and the (historical) conditions under which the research takes place (Gupta and Ferguson 1997). They see the field site as an analytical abstraction, rather than as a physical space that researchers can enter and leave (Marcus 1999).

The following paper is inspired by the anthropological approach to the field as constructed along with the object of study, as well as by recent insights from scholars within Science and Technology Studies (STS) (Gomart forthcoming; Latour forthcoming). We describe how, in our fieldwork, the field of study and the object came into being through resistances we met and how the fieldworker's perspective and questions changed during this process.

The paper is structured around two analogies based on notes from fieldwork. The fieldwork was carried out in the context of a research project on the use of an electronic patient record (EPR) by general practitioners (GP)[i]. The analogies demonstrate why fieldwork methods are apt for studying IT-use in practice as each in its own way highlights how GP work and the relationship to the patient is transformed as a consequence of using an EPR. In the first analogy we show how, like the GP must actively create structure in the EPR to make it work, the fieldworker needs to build a framework for generating her field data. Neither the categories in the EPR nor the framework is given, but emerge from existing insights and inscriptions. The second analogy demonstrates how - through negotiations around a research contract - the fieldworker obtains a perspective that allows her to make particular observations in the clinic. We discuss how issues of confidentiality and sharing data is 'foregrounded' during observations, and argue that to create new insights various actors need to 'get into shape'. In this section we see how GPs need to constantly balance their wish to protect patient information with other parties' requests to access and use this information, and how this is a process that is difficult to control. At the same time the 'openness' surrounding the EPR is sometimes used by GPs during consultations to make the patient 'appear' to them.

The analogies we use, firstly, function as a gateway to a discussion on fieldwork methods. Secondly, they bring out new insights about some (intended and unintended) consequences of using an EPR. The first analogy about structure and the EPR, thus, simultaneously provides an example of how we as researchers construct our site of study during the practice of doing fieldwork. When starting our fieldwork

we had assumptions about what would constitute our research site, but as it were, these assumptions underwent changes and the site was constructed anew. The second analogy shows how, not only the field site, but also the object of study comes into being through mutual engagement between research object and fieldworker. We see how being allowed an entry point from which to generate data not only happens as a result of having written the right letters and talked to the right people. Instead, data generation becomes possible as a consequence of a 'tuning in' process in which the fieldworker and an object of study are 'made available' to each other. We conclude the paper by discussing the conception of scientific research as 'risky', and propose to regard fieldwork as a search for ways of constraining the object of study, which will prove fruitful for new and surprising insights.

Structure 'on the fly'

The doctors in a small general practice, an in-law of one of the authors, needed somebody to stand-in for their receptionist during her vacation. It was in the beginning of a research project, and in spite of the potential dangers inherent in observing work in a different location (the reception) than where the focus of our research question was being performed (the consultation room) we decided to accept the offer. From the receptionist's chair the fieldworker would neither be able to observe the GP's entry of information into and retrieval of it from the EPR, nor would we be able to observe GP-patient interactions directly. However, the position as receptionist would provide ample opportunity to examine the structure and content of the EPR used in this clinic.

When arriving at the clinic the fieldworker assumed that the structure of the EPR would also structure the work of the GP in the sense that it would discipline him/her into making particular data entries. The GP's work with the patient would thus be based on the possibilities and limitations inherent in the EPR as much as on the GP's expertise and experience. In spite of work describing the 'fluid' nature of technology (de Laet and Mol 2000) and how technology gets worked-around (Berg 1997; Berg 1999), we focused on technology as a (manu)script for medical work (Akrich 1992).

On the basis of these ideas we wanted to 'map out' the structure of an EPR. This description, we imagined, would enable us to analyse how an EPR made possible very specific insights about a patient, and not others. We, in other words, were interested in how EPRs discipline GPs. But it turned out that the fieldworker did not really see the EPR discipline the GP for reasons we will discuss shortly. During the fieldwork she was, however, able to study the GPs 'discipline' or manage the EPR.

For one week, the fieldworker sat in the receptionist's chair and used the GP information system. She answered the telephone and booked appointments on the computerized day plan. She received patients and marked them "arrived", so that the doctors would know who was sitting in the waiting room. She entered lab results into the patient records, and renewed prescriptions for medicine to be authorised later by the doctor. In this work the fieldworker had access to all the patient records. However, she found little opportunity to explore the EPR's categories and functionalities. In-between patients coming, leaving, and requesting advice about their children's measles, or telephones ringing, urine tests, and instruments needing cleaning, she tried to print screens from the EPR and make notes about their sequence. She met all sorts of obstacles; it was, for example, difficult to print screen images, as the printer was set up for printing medicine prescriptions. Also, because there was a window between the waiting room and the receptionist's office and the receptionist thus was the 'public face' of the clinic, it was hard to find moments to make notes. The position as receptionist, in short, did not afford the kind of data the fieldworker had expected.

The GPs had generously suggested that the fieldworker stay in their house during the period of fieldwork. As the clinic and the private premises were located in the same building, the fieldworker not only slept there, she also had lunch and dinner with the doctors. The evenings thus provided ample time for informal discussions, as the doctors were curious to hear the fieldworker's point of view on the new functionalities in the EPR, to which they had recently been introduced by their provider. During these discussions the fieldworker's

research interests and the questions she posed changed and she found it necessary to extend her study site beyond the receptionist area.

Gaining an overview

The EPR with which the GPs in this practice worked, was a recent update called 'The Overview Record' (Aeskulap 7.0). 'The Overview Record' enables GPs to create different kinds of overviews based on data in the information system overall, as well as in parts of it. One kind of overview can be gained on the basis of 'record types' ('consultations/visits', 'phone consultations', 'discharge letters', 'hospital outpatient clinic', 'diagnostic images', 'pregnancy record', 'bookings', 'emergency', 'specialist', 'physiotherapist' etc.). These record types can in turn be combined and turned into 'menus', so that the GP for example can generate a list of all discharge letters received within a specific period of time. Another kind of overview can be gained on the basis of data entries on an individual patient, so that, for example, a list of the patient's medication, or of his/her diagnostic images can be generated.

To find out how the overviews could help them yield new insights about patients, the GPs needed to tinker with the system after work. As it were they would often stumble upon ideas as to how to use the EPR in a more appropriate way during working hours, but would have to wait until they had a quiet moment to further explore such ideas. In the following excerpt from an interview a GP explains about the overviews and reflects upon their usefulness.

GP: "If you press F9 you get a list of all the possible 'records' in one patient's record... 'overview record', 'archive', 'specialists', 'medication', 'lab results' etc. It has been arranged so that the EPR includes letters from the specialist, but you can choose not to use that function if you prefer only to see what you have written yourself. I ought to do that, I think, 'cause it's a bit messy now.

(pause)

In fact I think we need to change it so that information related to the specialists appears separately and not in the 'overview record'. But I need to agree on such changes with my colleague. It really has become a bit messy. But basically, you can set up the record as you like. It's your own choice. You can make a surgical overview or a medical overview if that's what you want, but I'm not yet sure what the advantage of that would be" (Interview, GP, 07.00).

Linking single data entries to a specific 'record' within an individual patient's record, and in turn linking such 'records' to a larger system of 'record types' and 'menus' enable GPs to gain quicker access to specific parts of the information stored in a patient's EPR. They no longer have to scroll 10 pages to find out whether a patient has had x-rays taken, but can simply enter the record type: diagnostic images and thus confine the information to one or two screens. The 'need' to reduce the amount of information on one screen, or the 'need' for specific overviews, neither are self-evident, nor can they be defined independently of the information already stored in the EPR. Instead, needing a particular overview is grounded in and defined by the historicity of the local EPR. Like Garfinkel, Lynch and Livingston (1981), who studied the 'discovery' of the optical pulsar, argued, a technology emerges and 'takes shape' in the hands of the practitioners on the basis of what is already there. "The strong orderliness of the pulsar 'is in the practitioners' hands', and this orderliness offers itself in elaborating details of attempts, repairs, and discards of locally motivated and locally occassioned modifications on the pulsar's existing material shape" (p. 137). Similarly, can the existing orderliness of the EPR be seen as 'lending itself' to the GP, whereby the need for a particular overview emerges.

A field site comes into being

We saw how, to use an EPR for their work, GPs did much more than just 'fill in' relevant information to the EPR; they also needed to define the structure, which would help them order patient information. As an analogy, the fieldworker also needed to do more than 'fill in' the position of a receptionist to obtain access to the study site. Like the GPs had to define a structure for their EPR the fieldworker realized that she could not start to 'fill in' observations in her notebook until a field site had appeared, yet, the field site slowly came into being as her research questions changed.

The busy days as receptionist 'undid' the fieldworker as fieldworker because of the problems she encountered of generating data while doing receptionist work. Because of these problems, she became attentive to the problems GPs had in generating and structuring data. GPs would, we saw, actively work on the structure of their EPR in their free time. She then became aware that she had to include these activities into her research: just like putting together an EPR based on the bits and pieces available to them was part of GP work, she had to construct her research site using what was available to her. Through the limitations in what she was able to 'see' as fieldworker/receptionist, a different perspective on the relation between GP work and structure in an EPR was made available to her.

One could argue that an important reason why this became possible was that the fieldworker had been invited to stay with the GPs and discuss with them outside of office hours. Otherwise she might not have been able to study how the GPs spent time modifying the structure in the EPR. But the point is not that the 'informal' discussions between GPs and fieldworker provided more interesting material than would 'formal' interviews, or that observing the GP tinker with the EPR after working hours would provide research data of a higher quality than would screen prints made via the receptionist's work station. It was not because what the fieldworker could see from the receptionist's chair was not interesting enough, or because she could not look into the GP's office, that she had to redefine her research site. Rather, the site she had defined prior to fieldwork - the space in and around the receptionist's workstation - yielded new questions and guided her into a different direction, whereby she had to redefine what would count as the research site. This made her attentive to the fact that GPs need to produce an EPR before they can use it.

Within anthropology, generating data and currently constructing one's site of study is no new discussion. It is the anthropologist in the field, the ethnographer, who delimits the site analytically and defines what counts as field material. A recent anthology on fieldwork brings into focus the problems of viewing the existence of the field or study site as a place, awaiting discovery.

"The notion of immersion implies that the "field" which ethnographers enter exists as an independently bounded set of relationships and activities which is autonomous of the fieldwork through which it is discovered. Yet, in a world of infinite interconnections and overlapping contexts, the ethnographic field cannot simply exist, awaiting discovery. It has to be laboriously constructed, prised apart from all the other possibilities for contextualization to which its constituent relationships and connections could also be referred. This process of construction is inescapably shaped by the conceptual, professional, financial and relational opportunities and resources accessible to the ethnographer" (Amit 2000: p. 6).

If one looks from this perspective, which sees the field site as constructed, the ethnographer could still be seen as in control. She makes analytical choices in her selection of what is field material and what is not, and she knows in advance that this has consequences for her analysis. We, however, realized that we were not in control of constructing our field site. Like creating 'overviews' in the EPR would emerge out of on-going activity in and around the consultation room, the fieldworker included the contingencies that she met as receptionist into her research design. The busy work as receptionist and the physical constraints she encountered when not being able to print screens did not 'harm' the study, but allowed the fieldworker to see that constructing a research site must be done simultaneously with producing research data.

Getting in shape

In order to generate data on the part played by an EPR in the consultation room, the fieldworker inquired about the possibility of carrying out observations in a health centre with six GPs. The doctors requested she apply for approval by a local research ethics committee (LREC). The fieldworker had no intention of trying out new drugs on the patients, participating in physical examination or even interviewing them, but wanted to observe the consultation, interview the doctors about it and

study patient records. However, as the application form was designed to account for clinical and not ethnographic research methods, most of the questions did not apply to our study. So the fieldworker filled in the application form, and included in the letter a description of the research project, an invitation from the GP practice, and various recommendation letters.

The committee replied that they would like to see a research protocol that would show what information the fieldworker planned to carry away from the clinic. On the basis of experiences from other fieldwork she, however, did not consider it very useful to use a standard recording sheet during observations. But at the same time she felt that producing such a protocol was necessary if she wanted to gain access to the consultation room; she therefore produced a protocol containing the following categories: 1) the physical position of the computer, the patient and the doctor 2) the main complaints of the patient 3) the screens of the EPR used by the doctor 4) their sequence and 5) the protocols used by the GP.

While the application was being processed we had email contact with the contact person in the clinic in order to arrange some new dates. The email conversation, however, was instrumental to more than changing dates. It was also a way in which the GPs tried to control whether data that could be considered confidential would be taken away from the clinic. In the email conversations it was for example agreed upon that not even anonymised patient records would be taken away from the clinic; all patient records had to be studied *in* the clinic. In practice, however, the fieldworker was put in a room in front of a workstation linked to the clinic's network. This, in principle, allowed full access to all patient records. We interpret this in the following way: the GPs were aware of the risk that allowing a fieldworker in would not provide new insights about their work, but merely 'perform' them as GPs, who would not responsibly protect their patients' confidentiality. So even though an approval from the LREC was crucial in order to formally allow the fieldworker into the clinic, it was for them no guarantee against unforeseen happenings and they engaged in further negotiations. Yet, what 'protecting patient confidentiality' meant, was still to be defined in the interaction between GPs and fieldworker.

The LREC approved the study and the fieldworker believed the problem of access was solved until she showed the information sheets, which were to be given to patients in the waiting room, to the doctors in the practice. The doctors had some corrections to the wording of the sheets, and the sheets were sent back and forth several times by email with additions or changes of the wording until the fieldworker started doubting whether the GPs were actually interested in participating in the study or not.

The day before the departure of the fieldworker (the practice was located in another city) the fieldworker had received the sheets for what she thought would be the last time. When she arrived in the practice, however, it turned out that one of the doctors had a few additional changes. Finally, the morning she was to start observations, the fieldworker received the printed patient information sheets from one of the staff in the clinic. Apart from the fact that the new sheets were laminated and in colour, the main differences were that "access to patient's electronic records" had been replaced with "view patient's electronic records", and "PhD student" had been replaced with "researcher". The first change from 'access' to 'view' thus carried the message to patients that even though research would take place in the clinic, the actual intervention should be considered harmless. The second change indicated that even though intervention was low, the impact would be high, as the study was not just carried out by a 'student', but by a 'researcher'.

Sharing data

To analyse the negotiation processes described above, we see the request to carry out observations during consultations as entering into a situation, where GPs feel it is being increasingly difficult to safeguard the confidentiality of the patients. At the same time, what 'safe-guarding patient confidentiality' means is contested and open to various definitions.

Doctors are frequently being requested to share data with outside actors; managers of clinical research databases, pharmaceutical companies and other health care providers. But no clear

distinctions can be made as to what can be shared and what should count as confidential under all circumstances. Because our request to study GP-EPR-patient interactions ethnographically was unusual in its kind, it meant that the GPs had to communicate to the fieldworker what according to them could be shared and what not. This created the situation that contrary to other fieldwork periods, where the fieldworker was allowed to study anonymised patient records and carry them away from the clinic, she here could access identifyable patient information if only it was not taken away from the clinic.

While observing a number of patient consultations by different GPs the fieldworker observed how the issue of access to data played a role in the consultation room as well. What would normally happen, when a GP saw a patient was that unless the doctor had seen the patient recently, s/he would retrieve the patient record before the patient entered the consultation room. The doctor would quickly run through the latest changes and additions and then call the patient in. The record would then usually be left 'open' on the screen, and as the doctors in this practice had designed their offices so that patients sat next to them instead of opposite them, the screen would be visible to the patient throughout the consultation. This also implied that if the GP received a phone call from a colleague or a receptionist during a consultation, and needed to retrieve a different patient's record to answer a question, this other patient's record would become visible as well.

The doctors had different experiences of working with an 'open' screen instead of with a paper record, which is not in the same way visible to the patient during a consultation. During consultations the fieldworker would observe how parts of the GP's communication with the patient was to let the patient see the notes on the screen; some GPs for example would enhance the visibility of the screen by reading aloud while typing in the notes, or use the screen to show a graphic to the patient (e.g. of test results that had been taken over a period of time). The point here is that like the fieldworker's experiences in the field are dependent on the negotiations with which she engage prior to and during fieldwork, GPs also constantly engage in 'negotiations' in the consultation room with the patient and the screen as 'participants'. In both cases the negotiations shape what the fieldworker/GP is able to 'see' about the research site/the patient.

The 'participation' of the open screen in a consultation was an example of the ambiguity of technology and was also experienced as such by GPs. On the one hand it was sometimes blocking the communication that patients could see the GP's notes; on the other hand, what was on the screen could be an occasion for aligning GP and patient expectations and further common 'collaboration'. Yet, what the patient would see or not see was experienced as difficult to control. A GP explained how the legal rule that patients should be able to know what the doctors write about them, for him was a reason to make data entries, which the patient could understand, but he also experienced situations, in which things needed to be recorded, which it was not in the patient's interest to see at that moment, for example psychiatric conditions. The visibility of the screen during consultations would thus put the GP and the patient on a common level of discussion. But it could also be detrimental to fruitful conversation and create confusion and anger. In the following quote a GP gives an example of this as he tells about his daughter's boyfriend, who became very upset when he realized what was on the computer screen.

GP: "It is interesting the feedback you get… my daughters boyfriend, he got very upset with what was on the computer screen".

Fieldworker: "in what way?"

GP: "It was the heading, the heading said influenza. Because the heading had been influenza from the start and he hadn't got influenza, he got septicaemia [bacteria in the blood, a very serious condition] and had to spend 3 weeks in hospital on intravenous antibiotics, and when he went back to tell the doctor, up came the screen and what was on it? Influenza. And I suppose, that is why I don't like putting too many definitive diagnoses up on the computer screen, because diagnoses tend to emerge." (Interview, GP, 02.02).

Interestingly, the GP concludes that rather than making his notes less accessible by hiding the

screen, he would rather make less definitive diagnoses – and keep the open screen. The visibility of the screen thus not only changes the GP-patient interaction by aligning/not aligning them on a common theme of conversation, it also changes the GPs' record keeping.

A different GP had similarly experienced how working with an 'open' screen could frame his interactions with the patient in an unhelpful way. In an interview he tells about one of his patients, who had had a provoked abortion. The patient repeatedly told the GP not to pass this information on to her partner; it was, however, entered into her EPR. Six months later the woman, one more time pregnant, came to see the GP and get a first pregnancy check along with her partner. The GP had noticed that the woman had been quite tense during their conversation and only later he realized that her record, and thus the information the GP had agreed not to disclose, had been visible, and thus shared by the partner, all the time.

During observations in the consultation room the fieldworker also observed how the open screen would make a patient attentive to his/her past conditions. To maintain the sense of 'here-and-now' that would often be necessary for the GP to entangle a patient's current symptoms some doctors would make notes in a paper record or just on a piece of paper and make the EPR mute by letting the medication list be visible on the on the screen. Only letting the medication list be visible would be a way of *preventing* that the EPR would participate in the consultation, as patients would normally know what medication they got and would thus not be surprised by reading what was on the screen. To make the EPR be supportive of the way they preferred to work GPs thus needed to actively manage the (in)visibility of the EPR.

Making a research object appear

We have demonstrated how, in order to become attentive to that which is not immediately obvious in the setting of a consultation, the fieldworker needs to be 'tuned in' on issues at stake in the consultation room. Through negotiations with the GPs and the LREC the fieldworker was allowed to see how GPs deal with the fact that an EPR is easier to 'share' than is a paper record. It turned out that issues of patient privacy and confidentiality and the EPR had to be approached actively by GPs, not only in relation to the fieldworker as researcher (or other third parties requesting information) but also in the daily work with patients. That these issues are high on the agenda for GPs was not surprising. It was surprising, however, to observe how they informed the way GPs would interact with patients and manage their record keeping.

Above we described troubles of gaining access to a research site. On the basis of that we argue that gaining access is not just a process of finding an 'open door' to interesting field material. Rather, in our case the negotiations brought the research object and the fieldworker into being in very particular ways. We described how we engaged with 'gate-keepers' of the field site up till the point where we believed we would not be allowed into the clinic at all. The process of making a research protocol, engaging in email conversations about exact agreements and negotiating the changes of the patient information sheets, thus was not just a troublesome process before the fieldworker would get to the 'real' data. Instead it was a process that made the research object 'appear' to the fieldworker, in the sense that it later enabled her to make very specific observations in the consultation room with regard to topics of access to data and confidentiality. Without having had to negotiate access in a way that mutually engaged the fieldworker and the GPs, it was likely she would not have seen how confidentiality and working around an open screen is an everyday concern GPs have.

Scholars within STS have described the troubles researchers encounter when doing research as 'resistances' (Despret forthcoming; Latour forthcoming). In a recent paper Despret uses the concept to think about the relation between researcher and the object in a rat experiment. She is interested in the way (nonhuman) objects are turned into objects that are available for research. Despret describes this process as an engagement process in which the researcher and the object constrain each other in such a way that it allows for a change of expectations. 'Resistance' in the context of an experiment is thus not something to be avoided, but should be seen as the *sine qua non* of interesting research.

She argues:

"One of the ways to resist an apparatus is to lead the experimenter to transform his/her questions into new ones that are the good questions to ask to that specific individual. In other words, an apparatus that does not stake on docility is an apparatus that is designed to give the opportunity to the 'subject' of the experiment to show what are the most interesting questions to address to him; what are the questions that make him/her the most articulate" (Despret forthcoming).

'Good' science is thus a science that challenges pre-set assumptions. It is thus *not* when the object of study objects to the assumptions made about it that researchers should worry, but when access to the research site happens smoothly and without any 'counter-questioning' from the subjects/objects studied. In contrast a 'good' scientific set-up aims at maximizing resistance from the ones, who are being studied, because this presents to the researcher an opportunity to learn. Without resistance, or what Latour calls recalcitrance (Latour 2000; Latour forthcoming), the researcher is unable to transform her initial questions, and will merely reproduce well-known insights.

This framework is useful for thinking about the position of the researcher, who studies information systems at work. The 'resistances' presented to the fieldworker by the LREC and the GPs when requiring about doing observations, not only made the object of study 'appear' to the fieldworker in a new way, they also fundamentally changed what she was able to observe. In the process she became a different fieldworker as the field site *constructed* and *performed* her in a way she had not been able to foresee[ii]. Negotiating conditions for access the way we described it above enabled the fieldworker to 'get into shape' for the observations of consultations. The negotiation processes did not bring her 'closer' to the GPs' experiences of using an EPR for their work. Instead, they shaped her perspective so that she was later able to observe the subtle interactions around the (in)visibility of the screen. In that way the negotiations provided a partial perspective productive for new insights about how an EPR would sometimes participate in the GP-patient interaction in unintended ways.

Conclusion

This paper started out with an interest in the issue of access to a field site. To address this issue we used two examples from fieldwork in GP practices and demonstrated the close relation between constructing a research site and engaging with an object of study. To tease out our points about ethnographic fieldwork in IS research and how to study unintended effects of information technology, we used two analogies.

In the first analogy we demonstrated how, to gain access to interesting data about how GPs use an EPR, the fieldworker needs to redefine her ideas of what and where the field site is. We made a comparison between GPs constructing categories in their EPR, and a fieldworker defining a framework for her observations. Based on this we argued that neither GP nor fieldworker would merely 'fill in' a pre-established structure. Instead both had to create one to be able to generate knowledge; the fieldworker to generate insights about GP work, the GP to generate insights about his/her patients. We pointed out that categories and overviews of patient information emerge out of a clinic's day-to-day work. In our example the EPR's structure came into being with close reference to the patient information already contained in the EPR. Like structure emerged out of the existing EPR, the fieldworker constructed the framework for her study on the basis of information available to her from her entry point as receptionist.

With our second analogy we pointed out how an object of study comes into being as a consequence of interactions in the field. We described how the fieldworker became aware of problems related to sharing patient information with third parties and with the patient through engaging in negotiations around obtaining ethical approval. At first, this was seen by the fieldworker as a problem mainly related to requests from outside actors (e.g. researchers), but during observations it turned out that issues of confidentiality were also at play in the consultation with individual patients in very particular ways. This became visible to the fieldworker by observations of interactions around the computer screen. By having already been 'tuned in' on the issue of confidentiality specific types of research data were 'made

available' to the fieldworker, and enabled her to observe how the subtle relation between the patient, the GP and the EPR was performed during a consultation.

In our analysis we found the conception of the field site as 'co-constructed' a useful starting point for thinking about how in our own fieldwork the construction of a research site takes place. To further think about how also the object of study and the fieldworker get constructed 'in action' we found work by science philosophers on the nature of 'the good experiment' and nonhuman agency inspiring. These scholars radically get away with the notion of 'bias', i.e. the belief that researchers can design their studies, so that these studies facilitate a more or less adequate representation of the reality the researcher aims at understanding. What is argued is that as all study designs have embedded assumptions and thus facilitate particular representations of the world, the researcher should experiment with different ways of framing the object of study. By currently challenging one's study design the researcher aims at constraining the object under study in different ways in order to identify the constraints that makes the object surprise the researcher (Gomart 2002; Gomart, forthcoming). What this approach highlights is the problem that researchers all too often make 'discoveries' that support their initial assumptions and which therefore do *not* surprise. To prevent this, researchers can focus on how resistances towards one's study design inform a study positively by actually allowing for changes of the conditions under which it takes place.

Allowing for transformations of the object as well as of the researcher also is to allow for knowledge production to be a "risky business, which has to be started from scratch for any new proposition at hand" (Latour forthcoming). Research is here seen as risky in the sense that there is no 'safe distance', which the researcher can uphold between him/herself and the object of study. There is, with reference to earlier work by Latour, no place outside the 'network' one is studying, for the researcher to remain untransformed (Latour 1987). But research is also risky in the sense that once transformations are allowed for, what the researcher is able to see changes. As what the fieldworker 'sees with' changes, there is no way in which she can predict or control the findings she will come up with.

By this we hope to have argued why fieldwork should not be seen as a way of getting 'closer' to the practitioner's point of view, but as an opportunity to engage in continuous negotiations and transformations of mutual points of views. 'Being there', in other words, is no guarantee that a researcher will be able to generate a truer representation of practice. Instead the usefulness of fieldwork methods, we argue, lies in the demand they put on fieldworkers to constantly search for new ways of constraining an object of study, in practice and in writing. Doing fieldwork, thus, is useful, not because it allows the fieldworker to be part of a natural set-up, but because it provides an entry point from where engagements with the field can take place in a way that allows for resistances and transformation of perspectives.

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[i] In the following, we actively use field material from two general practices generated by the first author. One of the practices is located in Denmark and one is located in the UK. The argument, however, is supported by data from fieldwork carried out in two clinics in The Netherlands as well. The intention of employing examples from clinics in two different countries, thus, is not to compare or highlight local differences of EPR use. Such differences have been downplayed in order to foreground the issue of fieldwork methods and their relevance for IS research (for comparisons of EPR use see Winthereik (forthcoming).

[ii] See also Mol (1998) for an elaboration of the notion of performance.

Appendix E

Winthereik, B. R. and S. Svenningsen:

"ICT and Integrated Care: Some Dilemmas of Standardizing Inter-Organizational Communication"
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ICT and Integrated Care: Some Dilemmas of Standardising Inter-Organisational Communication

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Abstract:

There is a growing interest in the issues of how to organize healthcare work along individual patient cases rather than along the demarcation lines of healthcare organisations. Health information systems, such as electronic patient records, are seen as important change agents, since they are asserted to help the coordination of care across organisations through fast and accurate exchange of clinical data. This paper explores how a semi-standardised discharge letter is employed to communicate knowledge about the patient between two organisational settings: the hospital and the general practitioner. We show how the discharge letter does more than transmit data about the patient: it plays a double role as informational tool and accounting device. And we argue that further standardisation of the discharge letter content – in order to facilitate electronic exchange – will strengthen the latter role as a tool for organisational accountability but weaken it as a clinical tool. We conclude that this finding adds to the theoretical understanding of how computers support cooperative work, and that understanding how healthcare professionals present themselves as accountable and trustworthy should be of major concern when designing healthcare ICTs.

Keywords: Accountability, communication, coordination, discharge letters, ICT, integrated care, standardisation, STS.

1. Introduction

> "The most promising route towards understanding medical (or other) work practices lies not in opposing the 'formal' to the 'informal' or the complexity of medical work to the record's impoverished representation of it, *but in seeing how the two merge and interlock.*" (Berg 1996: 515).

Healthcare is practiced within a widely distributed organisational network: patients and clinical data are sent back and forth between generalists and specialists to enable up-to-date treatment at the right time and place. Compared to former times, people live longer and more patients suffer from chronic diseases to be monitored by several care providers located in different settings. This combination of dispersion and long duration of patient trajectories, as well as experienced inefficiency in the co between organisational units, has sharpened the focus on communication within healthcare (Glouberman and Mintzberg 2001).

Related to the growing interest in inter-organisational communication is the concept of *integrated care*[1]. Key questions are: How can healthcare work carried out in different sectors and organisational units be coordinated in ways that focus on the patient and increase the quality of care? How can we create a 'seamless' healthcare system without errors, annoyances or extra costs arising because of the distributed nature of the work?

In the debates on the future of healthcare, information technology and increased standardisation of clinical data are often seen as solutions to deficient communication within healthcare (de Maesener et al. 1995; Branger et al. 1995; Hampson et al. 1996). The vision is that by standardising and electronically distributing central work

[1] An instantiation of integrated care that concerns itself with 'difficult cases' such as a mixture of chronic diseases in elderly people refers to itself as *shared care* (Pritchard & Hughes 1995; McGhee & Hedley 1995; Hampson et al 1996; Lee 1998; Rubak et al 2002). Pritchard & Hughes offer a definition of shared care: "Shared care applies when the responsibility for the healthcare of the patient is shared between individuals or teams, who are part of separate organisations, or where substantial organisational boundaries exist" (Pritchard & Hughes 1995: 8).

documents, healthcare providers would communicate faster and furnish each other with more accurate information. This applies to the discharge letter too, on which we shall now focus.

1.1.The discharge letter as a bridging device

The discharge letter is employed to ensure communication about patient cases between the hospital and the general practitioner (GP). The letter contains a summary of the treatments and interventions, which have been made during the patient's hospitalisation, and is sent to the GP on discharge. Its main function, allegedly, being to inform the GP about the hospital stay.

Although communicating about a patient through a letter may sound like a simple task, the discharge letter is being criticized for not doing a proper job[2]. The medical literature are pointing to serious problems of quality (lack of relevant information) and timeliness (too late arrival to the GP's clinic), and it is basically seen as failing its aim to facilitate communication on patients between the primary and secondary healthcare sectors (Olesgaard and Pedersen 1987; Nielsen et al. 1990; Jørgensen and Kjærgaard 1990a; 1990b; 1990c; Madsen et al. 1989; Grundmeijer 1996; Dougherty 1999).

Various solutions to the problem have accompanied the criticism. One suggestion has been, for example, for hospitals to give higher priority to producing discharge letters (Olesgaard and Pedersen 1987), to make interim discharge letters for the GP (Clements and Salter 1992) and to provide the patient with a copy of his or her medical record to bring along to the GP (Nielsen et al. 1994). Recently, it has been suggested to standardise the discharge letter content by laying down the appropriate categories, reducing free text notes, and using more diagnostic codes. This would allow the letter to be electronically generated on basis of information in the hospital's electronic patient record, which will, it is expected, speed up and improve the communication process (Adams 1993, Branger 1994, Dahl et al 1996, Van Walraven et al. 1999, Dougherty 1999).

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[2] Other contested documents are medication schemes and physicians' continuation notes, which are accused of being messy and without overview.

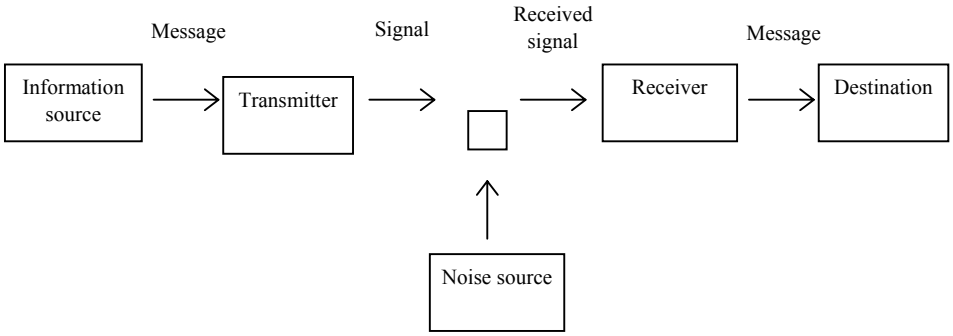
All of the above solutions share the assumptions that distinct and concise information forms the basis for good inter-organisational communication, and that new methods must be taken into account to speed up the selection, condensation and transmission of information. The focus lies on both standardising: a) work procedures around the discharge letter and/or b) the semantic content of the letter. This focus is also at the heart of other initiatives to improve healthcare communication such as standardising electronic patient records in order to ease the exchange of patient data (e.g. between hospital departments). Standardising discharge letters is thus only one instance of a general trend of standardising many aspects of health care communication to improve the overall coordination of health care.

In this paper we will question both the 'diagnosis' of and the 'cure' for the communication problems outlined above, demonstrating that in practice communication happens as a number of translations from the moment information is produced till it is used by a recipient. In the process multiple concerns are juggled and the framing and the content of the information change. On the basis of this we argue that further standardisation of the letter content, as an attempt to speed up distribution of relevant information, will not unambiguously support coordination among healthcare organisations. This is because standardisation of content will privilege a concern for organisational liability at the expense of concern for integrated care. The structure of the paper is as follows: First we examine two different theoretical conceptions of the communication process: communication as transmittance and as translation. Departing from the latter, we outline our research method, and present two empirical analyses. In these we explore the production and use of discharge letters in two organisational settings: the hospital and the GP's clinic. Finally, we question the idea that standardisation of information is instrumental to integrated care, and discuss how our analysis adds to the theoretical understanding of how ICT support cooperative work.

2. Transmittance or translation of information?

Proponents of coordinating healthcare through standardisation of the discharge communication employ the notion of communication as *transmittance* of information, and see the main challenge for healthcare to ensure that the process is precise and fast. This assumption is in the vein of C. Shannon and W. Weaver's (1949/1964) classic

communication model. They view communication as the process of transmitting a message from an information source to a destination through a transmitter and a receiver illustrated in the model below:



Shannon and Weaver explain the model in the following way:

> "The *information source* selects a desired *message* out of a set of possible messages. (…) The selected message may consist of written or spoken words, or of pictures, music etc. The *transmitter* changes this message into the signal, which is actually sent over the *communication channel* from the transmitter to the *receiver.* (…) The receiver is a sort of an inverse transmitter, changing the transmitted signal back into a message, and handing this message on to the *destination*. (…) In the process of being transmitted, it is unfortunately characteristic that certain things are added to the signal, which were not intended by the information source. These unwanted additions may be distortions of sound (telephony, for example) or static (in radio), or distortions in shape or shading of picture (television), or errors in transmission (telegraphy of facsimile), etc. All of these changes in the transmitted signal are called *noise*" (ibid.: 8).

In this view the fundamental problem of the communication process is to ensure that 'noise' does not distort the message on its way to the receiver. In the debate on how to coordinate healthcare through better inter-organisational communication this becomes a question of how to select information about the patient and encode it in a letter (that is,

sorting out irrelevant information and minimising ambiguity) and transmit it fast (that is, counteracting obsolescence of information).

In this conceptualisation noise is seen as *external* to the relationship between sender and receiver. Furthermore, sender and receiver are conceptually treated as well-defined, unequivocal entities, and the communication process as simply one of establishing a specific relationship between the two. These assumptions can, however, be questioned. Two authors that explicitly criticise Shannon and Weaver's model are C. Hayles (1999) and S. Brown (2002). Hayles argues that it is impossible to separate a message from the material in which it is embedded. Information simply cannot be transmitted between settings without also being changed, as information is tied to its materiality. Brown refers to philosopher M. Serres and states that noise in the communication channel is not merely an inconvenient backdrop against which communication unfolds, but is of informational value to the recipient as a productive component of the message. The basic process of communication is, therefore, one of *transformation*: the message is sent, but undergoes successive translations as it links with transmitters and receivers and finally with the recipient. This inherent transformation of the message is simultaneously a risk and a source of invention; successful communication, thus, necessarily involves the risk of failure. The risk of failure also exists in Shannon and Weaver's model (1964/1949), but here the assumption is that communication without translation is and should be possible. Constructionist researchers within science and technology studies STS draw on Serres and are seeing communication as a process of translation and transformation (cf. Latour and Woolgar 1979; Latour 1987; 1999; Law 1991), asserting that no entity, e.g. a message, exists on its own, but emerges as the outcome of heterogeneous relations. Moreover, an entity changes character as it enters into relations with different entities (a message inscribed in a letter is not identical with the same message being given over the phone). Attempts to stabilize a certain statement (i.e. make sure that a piece of information does not change as it 'travels' between contexts) involve the enrolment of supporting entities and the inscription of the statement into different materials. As it becomes associated with different materials it undergoes subtle or radical transformations. Inscription is thus part and parcel of stabilization; nevertheless the statement can only be relatively stable (Latour 1999: 70). This means that a piece of

information in one material setting is not identical with a piece of information in another; its identity – in the sense of its 'sameness' – relies on whether reference can be made to other stages in its trajectory.

By understanding communication as translation the focus is expanded to include also the organisational network of the sender and the recipient. Sender and receiver are embedded within organisations that are not uniform, rational frames of action, but complicated, conflict-ridden, and ambiguous. Moreover, the approach highlights the way in which inscribing a message into matter is an occasion for both stabilisation and transformation.

2.1. Research method

In this paper, we set off from these alternative assumptions about communication and follow the discharge letter from its site of production in a medical ward to a general practitioner's office. Hereby, we come to see that there is no original message being more or less polluted or 'decaying' during its transferral, but only active construction, trading-off multiple concerns and reconstruction all the way.

To limit the scope of our analysis we have chosen to focus on letters that are sent from a medical ward to the GP after a completed hospital stay. Interim letters, letters sent from one hospital ward to another or from private specialists are not discussed. The empirical backbone of the analysis is data from two independent research projects; one focusing on the use of EPR in a medium-sized hospital, and the other focusing on the use of EPR in general practitioners' clinics. Geographically, both the hospital and the GP clinics are located in Denmark, where a national standard for 'the good discharge letter' has been implemented recently (DGMA 2002).

The empirical material was generated through interviews and observations of work practices. Between 2000 and 2003 the first author carried out six weeks of observations of daily work in GP clinics. To obtain additional insights into the role of the discharge letter four interviews were held with two GPs and two secretaries specifically on the topic of the discharge procedure. The second author carried out 90 hours of observations in a hospital and held 12 interviews with medical physicians and secretaries in this and a different hospital. Additionally, we carried out document studies of the existing guidelines and recommendations on the discharge procedure.

During data generation we paid particular attention to how different actors worked together on specific tasks. Our interest in coordination work and its more invisible parts is inspired by science and technology studies (STS) (Suchman 1987; Berg and Mol 1998; Latour 1987; 1999; Law and Hassard 1999) as well as the strand of Information Systems Research (IS) studying record-keeping and its transformation through information technology (Ellingsen and Monteiro 2003; Aanestad 2002; Berg 2004; Monteiro 2003; Clarke et al 2003; Hartswood et al 2003). Elsewhere we have described our methodological approaches and research practices in detail (Winthereik et al. 2002; Svenningsen 2003). A common characteristic of our approaches, however, is the focus on how actors gain agency through their active positioning and repositioning in relation to other actors. In the following we shall describe how discharge letters are made to work through their relations with professionals, other documents, standards, etc.

3. The hospital: The discharge letter as a narrative accomplishment

In principle, a patient is discharged from the hospital, when his or her medical problem has been treated appropriately or alleviated, or when a patient dies. During the hospital stay a wealth of notes, figures, and pictures about the patient are produced and stored in the patient record (electronic or paper-based). The ward studied keeps electronic patient records, which hold most data. Data that cannot go into the electronic patient record are kept in separate plastic folders, called record-folders. When a patient is discharged, a 'final physician note' on the hospital stay and its outcome closes the electronic patient record.

The physician, who informs the patient that he or she will be discharged, is also responsible for producing the discharge letter. Because of holidays, workloads, or other circumstances, this task is sometimes delegated to another physician. Whoever signs it, the formulation of a discharge letter depends on preceding work of the secretary, who enters final test results, registers the discharge in the patient administrative system, and tidies up the patient record so that it will work as an orderly and clear foundation for the discharge letter.

The production of a discharge letter is a highly collective process, which poses certain challenges in terms of division and coordination of work and interdependencies

of tasks (Thompson 1967). Yet for now we bracket these other challenges and focus solely on the process of formulating the letter, since this small chunk of work holds its own dilemmas and challenges.

3.1 The format for discharge letters

An official standard exists for the form and content of 'the good discharge letter'. According to this, the letter should ideally contain the following elements:

a) Discharging hospital/ward
b) Date for admission/discharge
c) Referral diagnoses
d) Findings and final diagnoses of relevance to the primary sector
e) Summary of examination and treatment process
f) Total medicine list
g) Date of control visit (if any)
h) Information given to the patient
i) Expectations on the healthcare professionals taking over the case

(DGMA, The Good Medical Ward 2002, our translation)

Physicians at the medical ward explain that this order of elements is not coincidental. It is expressive of a special format for information about the hospital stay. First and foremost, the discharge letter names the actors involved and the date of admission. Next follows information about the hospital stay, which consists of elements that are causally linked: the patient is referred because of a problem (c) → the hospital does something to encircle and determine the problem (d, e) → the hospital finds a solution and tries it out (e, f, g) → the hospital evaluates the effectiveness of the solution (e) → the hospital delegates further work with the problem to others outside the hospital (i). Finally, the discharge letter states how the patient has been informed (h). Using the standard is a way of ordering, in which the hospital stay and the medical interventions are presented as a series of successive and logically connected events.

Viewed as a literary genre, the middle part of the discharge letter resembles the basic structure for a goal-oriented story (Stein and Policastro 1984). Of course, the discharge letter should not be a fictive story but summarise a real chain of events. It is

expected, though, that the physician does more than give a list of isolated data about the hospital stay. He or she must present the data as a logically coherent course of events, a narrative (Hunter 1991), which the standard suggests should be *goal-oriented.* The physician has not necessarily experienced these events, but he or she is to retell them in a sufficiently coherent way through a summation of statements from the patient record and from the physician's own memory. Yet it is no simple summation. The patient record can be seen as an 'imitation of events': a drama about the patient's hospital stay that is enacted through the many notes, figures, and lists, and the physician's own memory. In composing the discharge letter the hospital stay must move from being a sum of voices and statements to becoming a coherent narrative with a fixed narrator.[3] This is, as Weick puts it, a process of active sensemaking (Weick 1995), because a causality, which is not pre-given, must be established between events. But how is this accomplished?

The making of a physician note and a discharge letter are both communicative acts: they are statements made to interact with people and practices in and outside the hospital. But they also differ in important ways. Basically, the final physician note is just an entry in the patient record. It holds a summary of the stay, and it should be read in relation to the other entries in the record. Thus it adds to a local textual universe, and makes sense according to this (Heath and Luff 2000). The discharge letter, in contrast, must be able to work as a *self-contained* statement in multiple textual universes. It must provide an *account* of the hospitalisation event to other professionals and to healthcare managers (which is actually two different kinds of account, as pointed out by Suchman: "an inscription and documentation of actions to which parties are accountable not only in the ethnomethodological sense of that term (Garfinkel and Sacks 1970), but in the sense represented by the bookkeeper's ledger, the record of accounts paid and those still outstanding" (Suchman 1994: 188). It must also make an *argument* for these events to specific professional colleagues (see Ellingsen and Monteiro 2003). And, in some cases

[3] With Scholes & Kellogg we can say that a translation should happen from one literary genre to another, from a drama to a narrative. "By narrative we mean all those literary works which are distinguished by two characteristics: the presence of a story and a storyteller. A drama is a story without a storyteller; in it characters act out directly what Aristotle called an 'imitation' of such action as we find in life" (Scholes & Kellogg 1968: 4).

it must even provide an *explanation* of the events to the involved patient. Thus, the discharge letter is an equivocal text, which must balance technical jargon against layman expressions, and to balance legally binding against professionally convincing statements.

Sometimes the standard format is useful in making a letter that combines all those different elements and at other times it is not. Let us take a closer look at the everyday work involved in making a discharge letter in order to understand the varying role of the standard format for discharge letters.

3.2. From heterogeneous statements to a core narrative

Usually, the procedure for making a discharge letter will be the following: The physician finds a vacant computer and brings along the patient's record folder and a dictaphone. On opening the EPR he or she skims the record and checks if additional test results have arrived. The physician also looks through the record folder and reads some of the documents more closely. Although the physician is often familiar with the patient case, he or she must revive and clarify central events of the stay in order to present a coherent narrative. First step, therefore, is to create an impression and, subsequently, an overview of the patient's hospital stay and the medical case. Among other things it is important to re-read the admission note, test results, and concluding notes. Consider the way in which the physician tells about his reading of the admission note:

Physician: "I look at the admission note, because usually I have not written this. It says how the patient was when he came to the hospital. If he was in pain, if he had a high fever, was blue-lipped, was short of breath and the like. So often, I read this again."

Interviewer: "Why do you want to read this when making the discharge letter?"

Physician: "It is part of the summary. How was the patient when he came? It is part of building up a picture of the story we are presented to, and what we later decide to call it – both the diagnosis, which has been coded according to the WHO-classification, and its Danish name.

> One gathers the information relevant to the anamnesis: does he cough, is he short of breath, does he have pain he breathes deeply, is he feverish and has blue lips? This you write, and then you say that it is most likely pneumonia."

When dictating the discharge letter the physician's reading of the patient record and his or her knowledge about the patient case and the goal-oriented narrative format blend. The contours of a *core narrative* appear through the preparation (or "a picture is built up" as the physician puts it): What was the problem? What did the hospital do in order to specify and solve the problem? What were the consequences? What actions did the consequences give rise to?

Since the patient record can be quite comprehensive if hospitalisation has been lengthy and complicated, a core narrative works to guide the selection of elements from it: Which elements are necessary to propel the story? Which of the record's elements are important? And where must they be supplemented with the physician's own experience? Since the patient record is often not an orderly and internally consistent collection of notes and figures, the physician faces the task of drawing together a number of heterogeneous elements to establish a red thread in the discharge letter.

To exemplify this, the hospitalisation may be summarized as a narrative of relief, in which there clearly is a red thread (e.g. 'symptom – diagnosis – treatment'). But if the summary is a narrative of no relief (e.g. 'diffuse symptoms – ambiguous diagnosis – unsuccessful treatment') the physician will have to single out and link elements in a different way in order to still make a comprehensible narrative.[4]

To construct a core narrative is thus an equivocal task, as the physician must account for the hospitalisation and make a red thread even when there seems to be none. He or she must account for both the personal and organisational performance, and these

[4] It can also be a narrative of relief, but where the relief is tied to a redefinition of the original problem (e.g. 'symptom – diagnosis – examination – alternative diagnosis – treatment'). Such a narrative takes yet other compositional and rhetorical moves such as stating the reason for referral, some results disproving this, and then other results indicating a different diagnosis. One can say that the physician edits (Sahlin-Andersson 1996) present statements about the patient.

concerns have to be integrated in one and the same text, which is why it is not always an easy task to decide how to frame the narrative making up the discharge letter. That a discharge letter can also be used in a legal context makes it particularly complicated construct it around a core narrative of 'no relief'. Even though a narrative of no relief is a likely outcome of a hospitalisation, it is problematic to convey the impression that this is due to hospital incompetence or error. The patient is less prone to advance legal claims if the lack of relief is presented as the result of, say, an ambiguous pathological picture. The core narrative must, therefore, be coherent *and* sufficiently broad to encompass heterogeneous and not always consistent statements of the patient record, *but* signal organisational competence.

As we have seen, the narrative does not exist in a fixed form before the process of dictating it. It is tested and developed through the physician's chaining of selected statements and through his or her interaction with different audiences and current standards. This is not to be understood as an intended twisting or fictionalisation of existing 'facts', but as a basic characteristic of all reading and writing. Ricoeur calls this characteristic *emplotment* (Ricoeur 1983) – a text is simultaneously reflecting and acting in a course of events.

3.3. When a core narrative fails to emerge

Occasionally, a core narrative fails to emerge when the physician reads the electronic patient record and considers the patient case. If, for example, the electronic patient record has not been properly updated, the physician cannot follow the line of interventions and decisions regarding the patient and may not be able to create an overall picture. The patient may also for some reason have left the hospital before the case had been formally closed, and the record therefore lacks important elements, such as information about medication or after-care program. In this situation the physician must begin dictating without having the 'end of the story' to guide the composition. The standard format for discharge letters will then play the role of imposing order to the collection of disjointed written statements: it is no longer simply a resource (like when the 'plot' is clear), but a recipe for the text composition, as it tells the physician where the 'blank spots' are.

When the physician cannot find a red thread through the record data and maybe lacks personal knowledge of the patient case, he or she can still fill in the standard format. Dictation proceeds as a reeling off of elements from the patient record and from the physician's encounters with the patient until the different categories of the format are covered. Physicians point out that a bad discharge letter is long, is vaguely formulated, and carries unnecessary information. Such a letter becomes a symbol of organisational incompetence: "they couldn't quite find out about this". A long and unfocused letter signifies deficient professional control. A core narrative, in contrast, works to guide the selection of data to be included, ties the elements together in an effective (i.e. meaningful and economic) way, and conveys a sense of professional and organisational efficiency.

A core narrative is both a kind of pre-structure and the outcome of a complicated negotiation between entries in the patient record, the physician's knowledge about a case and the standard format of discharge letters. Thus, the standard format alone is no guarantee that a discharge letter is acceptable to all recipients *and* to the physician's organisational backing.

To conclude, we have demonstrated how producing a discharge letter involves other concerns besides informing the GP about a patient. Producing an overview of the patient case for internal purposes coincides with forming a professionally acceptable and institutionally liable account of the hospital stay. All these concerns have to be juggled throughout the making of the discharge letter and entail processes of data gathering, sense making, editing, and deleting. Even when the physician uses a standard format for the discharge letter, there is no guarantee of the result being a 'good' discharge letter, i.e. one that makes sense to all involved readers. A good discharge letter is clearly an achievement realized by the interplay of several elements.

4. The GP clinic: revitalizing the discharge letter

The moment a discharge letter enters the GP's practice its content is subject to evaluations on relevance. When a discharge letter arrives it is taken to the GPs office along with all the other mail. The GP opens the mail containing ECG results, lab results, advertisements from pharmaceutical companies, and discharge letters and skims the latter before passing them on to the secretary. In GP clinics the secretary is often

responsible for entering information from paper letters into the electronic record system. The secretary asks herself whether there is anything abnormal in the letter and decides what needs to be written into the patient's electronic notes, and what not. Some paper letters are kept and filed while others are thrown away. If, according to the secretary, only a small part of the letter contains relevant information (e.g. the result of a blood test), she copies this part into the patient's notes and throws away the original. If the content of the letter is more comprehensive, she writes a reference date on the letter, puts the same date in the patient's electronic notes, and files the letter in a ring binder.

4.1. Feeling safe

During an interview a secretary gives an example of a letter, which is "relatively easy". The letter reads: "The patient has been to the orthopaedic surgery department for a final check-up. No further follow-up is necessary". The secretary copies these few sentences from the letter into the electronic record before throwing the letter away. The secretary's routines, when handling discharge letters, are aimed towards meeting the GPs' need for order and overview regarding patient data. She explains that it is important for GPs to 'feel safe', which means that they should always be able to look up the information relevant for a specific case. The challenge is thus to distinguish between what is relevant today and what may be relevant in the future. The relevance of the information in the discharge letter is not clear-cut, even though the content of the letter may be straightforward and the language clear. Relevance and meaning are not the same in every situation and cannot be codified into the discharge letter in any permanent form. Relevance must be constructed on the basis of the available information, the GP's knowledge about a patient, and new clinical findings (see also Hislop 2002).

Not all discharge letters are written on paper; some arrive via EDIFACT[5] and are downloaded from an internal mailbox a couple of times a day. Those letters arrive in a separate section of the clinic's electronic record system and are accessed by the GP without the secretary as intermediary. A newly arrived letter is marked with a 'not read' sign. When opened the 'not read' sign turns to 'read'. Both the GP and the secretary can be assigned access to the EDIFACT-list.

[5] EDIFACT (Electronic Data Interchange For Administration, Commerce and Transport) is a global standard format for exchange of electronic data.

In one of the GP clinics, only GPs have access to the incoming discharge letters. The explanation was that a GP, when quickly scanning the list, can falsely believe that a discharge letter has been read by another doctor though it was in fact read by a secretary. Since the GP needed to open the letter to see who had turned the 'not read' sign into 'read', the GPs had decided not to assign access to the secretary. Consequently, the secretary was not in the same way held up-to-date with a patient's whereabouts, as she could only read the messages after they have been opened by a GP.

The secretary's access may seem to be a minor issue when discussing how ICT coordinates work tasks between organisations. However, the secretary is a gatekeeper to primary care services in local GP clinics. And since the letters sometimes contain information that enables the secretary to do her job better (e.g. communicate with patients and make a more effective day plan) the restricted access to discharge letters makes her work as a gatekeeper more complicated. When the secretary is turned into a 'secondary reader' the quality of the information given to patients may be seriously hampered.

Above we argued that a good discharge letter from the hospital's point of view is a letter that presents a clear and unambiguous account of the patient stay, but we also learned that sometimes the last part of the letter is missing, which is the part including information about medication and after care programs. What according to the secretary's account is a good discharge letter is exactly the information from the last part, as this information enables her to do her job. When asked what constitutes a good discharge letter, the secretary says:

> "[A good discharge letter] offers a short description of what has happened at the hospital. They don't have to show lab results, but if they have made blood samples that don't show anything, they should state 'nothing abnormal', or if the samples do reveal something important there should be a description of what that is. And then there are the appointments for controls. I don't care about knowing when people have their appointments, the patient should know that, but I *do* care about knowing if there is any after care. Patients often ask: what did the hospital tell you? And well, perhaps we provide too much service, but I like

to be able to tell them whether they need to do a follow-up at the hospital or not."

For this secretary a 'good' discharge letter is one that enables her to tell patients, who call the GP practice, whether their test results are normal or not, and whether the patients need to take further action such as calling the hospital or seeing their GP. In relation to the issue of healthcare coordination a good discharge letter enables the secretary to work as a buffer between the GP's clinic and the hospital. Reading and assessing (and in some cases archiving) the letters enables her to be up-to-date with treatments at the hospital. This in turn allows for a simultaneous linking and division of work and responsibilities. The secretary is in a position to link the hospital and the GP practice around a patient's case. She can, for example, talk to patients about what actions they have been told to take, or about what programs they have been requested to follow by the hospital.

When information is missing in a discharge letter, its role as a coordination device diminishes. Standardising the content of the discharge letter to the extent where all fields carries a diagnostic code, which makes possible a direct import into the patient's notes, may have certain advantages. Clearly, it is a financial advantage for a GP practice if the secretary does not need to spend time copying and filing the paper letters. But in terms of linking the hospital and the GP practice, this form of standardisation may hamper the secretary's role as a gatekeeper and as an actor, who, together with the discharge letter, coordinates separated organisational unit.

4.2. The GP as recipient and editor

While electronic discharge letters do not unambiguously support the secretary in carrying out her work, they are less ambiguous in relation to the GP's work tasks. The letters enable GPs to know what has happened at the hospital. At the same time they enable GPs maintaining a separate area of responsibility and expertise, which is different from that of the hospital. This double role can be illustrated by the way the GPs edit discharge letters that arrive electronically.

As mentioned, electronic letters are downloaded to an internal mailbox in the computer, so that *in principle* they only have to be transferred to the patient's EPR. *In practice*, however, the process of receiving electronic letters involves a great deal of

sorting out information. As letters are often long, and not all the information conveyed is considered equally relevant for GP work, choices must be made in the process of transferring a letter from the mailbox to the patients' notes. When moving a letter from the EDIFACT-list to the patient's notes the GP pays attention to a number of things: What happened to the patient during hospitalisation? How was the patient diagnosed? And how did diagnoses and any new medication fit the reasons for referring a patient in the first place? What medication did s/he get? Was medicine continued or discontinued? In this process the formal structure of the letter is re-worked and modified (see also Berg 1996 for an analysis of how such re-workings of documents are done in a hospital setting). Modifications take many different shapes, but often they happen by means of colouring as a way of reordering the letter. One of the GPs observed used a function intended for printing out documents. If the GP wished to highlight the reason for hospitalisation (when it differed from the reason for referral) he or she marked the relevant sentences green. The parts about the medication were marked red. If the GP then would print the document, the red and green parts would appear as underscore or italics respectively.

Highlighting the text allows the GP to simultaneously keep a whole letter and split it into tiny bits. By using colours the GP is able to preserve the original text while inscribing what, in her opinion, is important/less important. This way she can always go back to the original text. Why this extra work? One explanation could be that adding her own interpretation while literally letting the hospital's writing 'shine through' allows the GP to relate to the hospital's suggestions while the letter is 'domesticated' and turned into 'her own'. Reworking and modifying the letter enables the GP to determine what she thinks is relevant, which ultimately allows her to perform as a competent professional in control of the situation. Consider the following quote:

> GP: "...so that when he [the patient] is sitting here and asks me to comment on particular information in the letter, then it [a particular piece of information] is green, right, then it catches the eye."

The consequences of the GP's editing are even more pronounced when sorting out the diagnosis list. An electronic discharge letter sent directly to the GP's filing system, the

EPR, is meant to keep the GP up-to-date in order to allow him or her to act in accordance with what the hospital suggests. Moreover, editing the letter enables the GP to establish a separate area of expertise. Editing the discharge letter for example enables the GP to offer a second opinion and thus fulfil a function in relation to a patient that is different from that of the hospital physician.

From the perspective of Shannon and Weaver, re-working the letters the way it was done in the example would be 'noise' in the communication process as new interpretations occur and original meanings may disappear. In a paper on the growing collaboration between two professional groups in the development of immunology and epidemiology, I. Löwy argues that 'loose' or 'imprecise' (i.e. 'noise' in Shannon and Weaver's terms) concepts are active in forming bridges between professional groups:

> "Imprecise concepts may help to link professional domains and to create alliances between professional groups. Such alliances allow professional groups to adapt themselves to a changing cognitive and social environment while protecting their investment in a given set of experimental practices and their authority over a specific field of expertise" (Löwy 1992: 373).

According to Löwy professional groups may create alliances through loose concepts. However, she further argues, *when alliances are made a need arises for protecting one's own field of expertise*. In relation to GP-hospital cooperation and distinct areas of expertise are co-produced through the edited discharge letter. This becomes even clearer when we see how letters that follow the standard format for discharge letters are sorted out by the GP below.

4.3. Staying in charge

Concurrently with using colours to create her own version of the 'hospital drama', the GP changes the diagnostic overview that appears in the discharge letter. What is changed is the order of the headings, i.e. the encoded diagnoses that function as head-lines (in the ICD classification DZ033, for example stands for "observation because of

suspicion for disease in neural system" [6]). Such headings already exist when the electronic letter arrives, but often they are of little or no relevance for the GP. Creating new headings is thus a way, next to colouring, in which the GP makes discharge information fit the purposes of general practice.

In the discharge letter the diagnoses given to a patient during hospitalisation appear in two clusters: *action diagnoses* and *other diagnoses and surgeries during hospitalisation*. The diagnoses are listed within these clusters in alphabetical order and with an ICD-code attached.

GP: "Look at this one. He has been hospitalised with a coronary thrombosis, but then he was also admitted at the urological ward because they suspected he had a problem with his bladder. Then we get two diagnoses. All of that are their [the hospital's] writings. Then I have chosen which of them should be the heading in my record system, and there you see it."

Interviewer: "In the 'action diagnosis' field?"

GP: "Yes, and there you have the rest of the diagnoses from the hospital, and then I say, if you had seen it when it arrived. If I had just moved the whole list of diagnoses the way it arrived in my system, this one would have been on top of the list simply because it starts with a 'd', but I think that one [points to the reason for hospitalisation that was the thrombosis] is more important and therefore I chose it as my heading."

In this quote the GP explains how she prioritises the diagnoses on the lists through ordering them in a new way. It is important for her that what she thinks is the most relevant diagnosis appears on top of the diagnosis sheet and not just listed alphabetically. Here we see how even the diagnostic code – a 'golden' standard for

[6] ICD stands for: International Classification of Diseases.

presenting medical work outside the context of the production of the data[7] – does not in itself ensure relevance: the 'formal' code must be transformed in the process of revitalising the discharge letter. This is in tune with G. Ellingsen and E. Monteiro's point that letters, in which hospital physicians are "to the point" – are often harder to read for the GP, as they increase the need for sense-making (2003: 221).

To sum up, we have seen how relevant discharge information does not simply 'flow' into the GP clinic on the 'carrier' of the electronic discharge letter. Establishing electronic communication and standardising discharge letters may support faster communication, but the information still needs to be rendered useful by the recipient. In the GP clinic, simultaneously transforming the letter and keeping it intact did this, so that information could be used in relation to future, uncertain tasks.

5. Discussion

> "It is by no means 'given' what constitutes relevant knowledge" (Ellingsen and Monteiro 2003: 222).

It is widely held that modern healthcare is too fragmented. Often, a patient trajectory runs through many organisations that know little of each other's activities, and this may lead to mistakes in treatment or reiteration of activities. One prominent solution is to coordinate care by employing ICT to improve and speed up exchange of patient data across organisations. This solution is a call for increased standardisation of the procedures whereby patient data is produced, condensed, sent, and received. But is successful communication really a matter of standardising the selection, encoding, and transmittance of information?

Departing from an alternative view on communication – communication as translation – we have examined two organisational networks, into which a semi-standardised discharge letter has been introduced in order to facilitate the coordination of patient-cases. By following the discharge letter empirically from the hospital to the GP's clinic, we have presented a picture of the way communication happens between

[7] See B. Winthereik 2003 for an analysis of the use of diagnostic codes in three GP clinics.

organisations that is more complex than what we find in the literature about discharge procedures.

First, we have shown how communication is not an unequivocal thing. Producing information is both a question of informing others about the patient and giving an account that corresponds with organisational liability in a specific context. Likewise, the usage of information is both a question of understanding what has happened to the patient, of documenting this and of determining how the information can inform further work. Thus, there is no single communicative purpose, or in other words, no uniformity between the motives of sender and recipients, and it is therefore not given in advance what will count as relevant information or successful communication.

Second, we have pointed to the ongoing translation processes through which the semi-standardised discharge letter connects healthcare providers. The combination of established information categories and free text, it was demonstrated, allows the semi-standardised discharge letter to simultaneously support concerns for organisational accountability and concerns for clinical usefulness when informing and receiving information about a patient. How do these two findings add to the theoretical understanding of ICT and inter-organisational communication?

Research into the role of computers in cooperative work have pointed to the various ways in which computers take part in articulation work, that is the ongoing activities involved in the coordination of organisational tasks (Schmidt and Bannon 1992; Schmidt and Simone 1996; Suchman 1996). Researchers have taken the insights about articulation work and brought them into studies of health care ICTs. It has been described how ICT has facilitated the sharing of knowledge between health care practitioners (Schneider and Wagner 1993) and the accomplishment and shaping of medical activities through the accumulation and coordination of medical statements (Berg 1999). Other analyses have pointed to the way ICT may also hinder the accomplishment of medical tasks (Heath and Luff 1999; Hartswood et al. 2003).

In this paper we have described another important function to which healthcare ICTs are put. This is the production of organisational accounts and demarcation of areas of responsibility. We are not the first to point to the fact that ICT not only works as a coordinating mechanism, but also as a tool for organisational accountability (Suchman

1994, Dourish 2001). Neither are we the first to argue that this latter role may sometimes work against efforts to coordinate work. Bowers et al have, for example, shown how a computer system in the print industry afforded the making of production reports for the customers, but made the daily work activities more laborious and invisible (Bowers et al 1995). However, our analysis of communication around discharge has elaborated this point, showing that informing about and accounting for a practice are two sides of the same coin, yet hard to balance in practice. On the basis of this finding, we will now argue that the degree to which communication is standardised will affect this balancing act.

When wishing to improve inter-organisational coordination by standardising the communication one engages in a balancing act. Too much free text and too few diagnostic codes hampers coordination, because it takes time to read and write free text messages. Furthermore, the meaning of free text can be ambiguous. On the other hand, overly standardised messages, i.e. a letter that only contains information in a coded form, may make it more laborious to fulfil both concerns or may lead practitioners to give priority to making a liable rather than a clinically useful account. Let us explain why:

5.1. Standardisation may provide a polished account of events

In the discourse on integrated care, standardisation of the discharge letter content is suggested for improving its clinical relevance. We will, however, argue that the overall effect might very well be *less* clinically relevant information, because of the duality of the hospital's information work. On the one hand, the patient trajectory must be documented in order to let others take over the provision of care. On the other, the hospital must present this in a way that signals competence and liability. In some cases, these two concerns can easily be combined. Yet in others, they will collide (e.g. if small mistakes and remissness has been made during the patient's hospitalisation). With the present semi-standardised discharge letter, it is possible to work around this dilemma, by stating 'facts' such as diagnoses, test results, and medication while at the same time indicating the dubiousness of these facts between the lines. If the discharge letter is further standardised (e.g. holding only keywords such as: referral diagnosis, test results, diagnosis, medication, and treatment plan) it may be hard for the hospital to produce a

letter which holds this ambiguity. Physicians may feel called to fill out the slots of information as if this information were a robust representation of the hospitalisation, rather than taking the institutionally problematic decision of not filling out the discharge form and initiating a process of organisational elucidation and placing of responsibility. The letter would then become a more *solid* document in a bureaucratic and legally sense, holding a seemingly objective and unambiguous account of the hospital stay – a 'god-trick', as D. Haraway (1991) puts it. In a *clinical* sense, however, the letter would then also be a *poorer* document, as it provides a polished and too unambiguous version of the course of events at the hospital.

This has to do with the nature of healthcare work. In healthcare, tasks are often fuzzy, complicated, and involve a great number of people and technologies, whose activities are intricately linked. It is a classic idea that organisations facing such uncertain tasks need high levels of information processing and exchange of data across units (Galbraith 1973). This is clearly the case in healthcare. But data must be understood in a broad sense. Often, organisations handling uncertainties may be well served by tolerating equivocal information, because unequivocal, exact messages can oversimplify complex, ill-defined events (Weick 1995). It can be most valuable to keep open possibilities of interpretation and reading between the lines when tasks are uncertain and multiple stakes are involved (Daft and Mackintosh 1981). So even though standardising key information such as diagnoses and drugs, makes the discharge letter clearer and unambiguous – apparently improving data exchange among healthcare organisations – it may have serious consequences for the letter's performance as a *clinical* tool. Strong standardisation of content (e.g. as fully coded discharge letters) may lead to a dangerously firm framing of patient cases.

Despite these claims, our analysis *also* points to how it may be possible to *further* the integration of healthcare organisations through standardisation. Showing how medical workers constantly work to distinguish areas of responsibility indicates that it may be useful to focus more on the *specific places in an organisation in which coordination and integration actually happen*. One such place of coordination which our material pointed to was the situation in which the secretary in the GP clinic goes through the letters to prepare herself for patients who call the clinic to make appointments or ask questions. Attempting to understand how the secretary acts as a

bridge between the two organisations may be more useful when designing a 'good discharge letter' than attempts to create a common standard that does the standardisation 'on its own'.

5.2. Standardisation increases the need for translation work

Narrow framing of patient cases can have grave implications for the patient in question. Yet healthcare professionals will find ways to work around categories that do not fit the way they work and informally seek up additional necessary information. In order to integrate healthcare work through standardisation, much extra work must be done (Berg and Goorman 1999; Berg 2004). Berg argues for a 'law of medical information', which points to the problems of using the same information for clinical, research, and management purposes:

> "The further information has to be able to circulate (i.e. the more different contexts it has to be usable in) the more work is required to disentangle the information from the context of its production" (Berg 2004).

The GPs already carry out largely invisible work in order to re-vitalise the discharge letter as a clinical tool. We argue that further standardisation of discharge letter content may increase this additional work for the GP, because standardisation may increase bureaucratic but not clinically useful information, and because clinical tasks are often too complicated to be framed in a few codes. Thus, although a fully standardised letter is intended to be useful everywhere and need no interpretation by its receiver, in practice, the GP needs to 'crack the code' of a text by inscribing it into new cognitive and material frames of reference.[8] This entails that the GP, while doing business as usual (assessing a patient's case with his or her own clinical 'tool box') *also* takes over

[8] This also counts for other users such as insurance companies or clinical researchers, who use information from an EPR for purposes that are in principle secondary to the context of its production.

responsibility that belongs to the hospital and starts to act as a 'safety valve', because the extra interpretation and checking up on what has been done at the hospital is shifted to the GP. The GP faces an extended package of tasks: both making sense of the information and determining whether what has been done at the hospital was clinically responsible or not. Not only does this take extra time, it also requires knowledge and skills that the GP may not presently have.

5.3. Research implications

By analysing the production and use of a semi-standardised discharge letter, we have pointed to the ways in which the letter simultaneously acts as an accountability tool and a coordination device. We have argued that overly standardising the discharge letter's content may stimulate healthcare professionals to make too polished accounts of healthcare activities in order to fulfil concerns for organisational liability. Standardizing the letter may thus make it apt for demarking one's area of responsibility, but unapt for communicating around a patient's case.

The ambiguity of semi-standardized discharge letters can be seen as important for their relative success, but also as a problem to be dealt with under increasing pressures for demonstrating accountability. Attempts to fix the meaning of a letter's content through standardisation may easily undermine the letter's present quality as a clinical tool and make it unapt to solve tasks as shared, clinical tasks. If the discharge letters and similar documents are to have a role in the realisation of integrated care it is, therefore, crucial not only to settle with discussions of how to stabilise their content and meaning through standardisation, but to carry out research into how healthcare information is translated in the communication process. This should be done to 1) understand how information about patients circulates in and across healthcare organizations, 2) to identify the specific moments where standardisation effects coordination and communication, and 3) to identify the moments where standardisation impedes coordination and communication between organizations.

This is a call for being specific and initiate research into the current pressure on medical documents to perform equally well as clinical and bureaucratic/legal documents. In this paper we have hinted at some of these pressures, but more research should be done into how different forms of standards such as 'the good discharge letter'

may be designed to inform its many audiences, yet be sufficiently flexible not to close off other professionals' interpretation on a patient's case.

We need more research into the relation between articulation and accountability in order to understand the way in which ICT can be designed to support both aspects in the context of medical work. This does not mean, however, that we should search for "the real practice" to be supported, as has been a classic ambition in much CSCW-research. "Practice" is never singular, but ambiguous and many-sided, and as Berg argues in the introductory quote, formal and informal practices always merge and interlock. There are fuzzy and fragmented versions of practice as well as the coherent and meaningful versions.

How do standards work? The question remains relevant and the insights it generates are crucial if we want to determine what form(s) of standardisation will be appropriate within healthcare. Although we may want general answers, this question should first and foremost be an empirical one. What kind of cooperation takes place in specific situations? What kind of disintegration takes place simultaneously? What work is necessary to make different kinds of cooperation happen in inter-organisational network? Who is going to do the extra work it takes to standardise?

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Appendix F

Winthereik, B. R.:

"GPs and Patients as Partners: Interaction by the computer Screen"
Submitted to *Information, Communication and Society*.

General practitioners and patients as partners: Interaction by the computer screen

Brit Ross Winthereik

Abstract

This paper is part of a study focusing on the consequences of using an electronic patient record (EPR) among general practitioners (GPs). It describes encounters between GPs and patients in the consultation room and offers an analysis of interaction by the computer screen. The focus is on the way the GP-patient relationship is being performed by the set-up of the screen. Two kinds of work arrangements are described; one in which the screen is accessible for the patient during the surgery and one in which what is written on the screen is hidden from the patient. The paper shows that the effect of the screen is ambiguous and it does not *either* support *or* block communication with patients. The screen may be employed to make patients articulate about their disease, but this demands work by the GP. The paper argues that studying interaction by the computer screen can offer insights that may fruitfully inform discussions of how to use the computer screen for shared decision-making.

1. Introduction

As the functionalities of electronic patient records (EPRs) are extended and the medical field is getting increasingly politicized, the role of ICT as a way of improving communication with patients takes up space in the health care debate (Brennan and Strombom 1998, Bental et al. 1999, Little et al. 2001, Stewart 2001). The issue that is being discussed is how ICT may stimulate healthcare practitioners in demonstrating a more patient-oriented approach. Discussions of a patient-oriented approach and patient-centred care are not new. P. Byrne and B. Long originally introduced the notion of patient-centred care in 1976. In a seminal book on interaction in the doctor's clinic they demonstrated that doctor-patient interaction was often driven by doctors' agendas (Byrne and Long

1976). According to Byrne and Long's original definition patient-centred behaviour refers to the doctors' interaction with patients. Doctors should seek and accept patient ideas as well as seek and give recognition and encouragement. In short, doctors should centre the conversation on the patient's agenda instead of letting it be guided by their own.

The notion has had a revival in relation to recent interests in patient values and preferences (Stewart 2001). To me this became obvious during my fieldwork in GP clinics, where I conducted fieldwork to study the consequences of EPR-use. I met a number of GPs, who were all very conscious about how to include the computer screen in their interaction with patients. Many of the GPs clearly felt that they had a valuable relationship with patients that might be harmed through the use of a computer. Generally they feared that turning the screen towards patients during the consultation would have an impact that they could not control. The GPs feared that they would be tempted to look at the screen all the time, or that patients' attention would be drawn towards what was written on the screen. At the same time, however, the GPs regarded working with an open screen a gesture that would stimulate trust between them and the patients. They for instance argued that working with an open screen would demonstrate to the patients that they were patient-oriented and that they favoured an open and democratic conversation.[1]

This fear that computer-use has unintended effects largely corresponds with findings reported in the literature. Studies have described the effects of computer-use on the GP-patient interaction for example how GPs glance on the screen while patients explain things, or how they abruptly shift topics in order to elicit information required by the system (Greatbatch et al. 1995: 33)[2]. To my knowledge, however, no studies have focused on how GPs attempt to include the screen in the communication with patients. The following analysis therefore takes its point of departure in the notion of the screen as a participant in the surgery. In what follows I examine its role, how it is involved or not involved in the interaction and how it influences the GP-patient relationship. The questions I will pursue are: *How do the GPs attempt to involve the screen during surgery? How do they attempt to control the unintended effects of the computer screen on their interaction with patients? And what is the consequence of the position of the screen for the GP-patient relationship?*

First I outline the theoretical departure points for the analysis and the methods employed. Second, I give examples of the screens 'pages' that may be shared with patients during surgery.

[1] In the following I use 'open/closed' screen as a way of talking about whether the screen is visible for the patient or not.
[2] See also Warshawsky et al. 1994, Sullivan and Mitchell 1995, Als 1997.

Third, I present the empirical data from my fieldwork in GP clinics, and finally, I discuss how studying the interaction between GPs and patients by the screen may inform discussions of how to employ decision aids in the surgery.

1.1. Theory and methods

The paper builds on insights from the field of Science and Technology Studies (STS) and actor-network theory (ANT) that view social and technical phenomena as mutually constructed (Latour 1994, 1999, Law 1991, Law and Callon 1995, Berg and Mol 1998). Within ANT and STS, scholars have studied how technology is not just passive a means to achieve a certain result in the social world. They have pointed at how technology is an actor in the sense that it makes connections to other actors, human or nonhuman. By thus forming heterogeneous networks or hybrids between humans and technologies, technology can be said to 'act', and it then becomes pertinent to study what specific actors 'do' in particular networks.

The notion of network is introduced as an analytical concept, not because it applies to the empirical case of an information system's network, but because it highlights the importance of relations between actors and the work done by them to achieve certain effects. B. Latour in a mock dialogue with a student explains what a network is:

> "Being connected, being interconnected, being heterogeneous, is not enough. It all depends on the sort of action that is flowing from one to the other, hence the words 'net' and 'work'. Really, we should say 'worknet' instead of 'network'. It's the work, and the movement, and the flow, and the changes that should be stressed. But now we are stuck with 'network' and everyone thinks we mean the World Wide Web or something like that." (Latour 2003)

One of the characteristics of the network as analytical construct is that it stresses how relations turn actors into what or who they are. Agency and identity are thus achieved through *connections* formed with other actors. When Latour suggests studying "the work, the flow and the movement" the reason is that from an actor-network perspective there *is* nothing else to study than such activity. In relation to the GPs, it is relevant to ask how the screen obtains its agency in practice. As argued above, GPs are ambivalent about whether to include the screen or not during surgery. On the one hand, the GPs hope that an open screen may form a way of including patients more in the decisions made during surgery. On the other hand, they fear that the screen can transform their relation to a

patient by creating an unintended link between the patient and the screen; or put in actor-network theoretical terms, they fear that the screen *translates* a patient's original goals or interests (Latour 1994, Brown 2002). Translation, as it is used here, refers to displacement or as Latour explains it: "I use translation to mean displacement, drift, intention, mediation, the creation of a link that did not exist before and that to some degree modifies two elements or agents" (1994: 32).

Recently, within STS there has been a performative turn with respect to how the relation between actors are regarded and analyzed. Scholars have left behind the constructivist language of the actor-network theorists and talk instead about how objects are *performed* or *enacted* (Mol 2002, Law and Mol 2002). These scholars argue that the advantage of using theatre metaphors is that the actors remain vague; instead the multiplicity of objects and activity is brought into focus. A. Mol for example suggests a praxiographic approach to be able to study how objects are enacted (Mol 2002). This implies never to isolate a phenomena from its material context.

> "An ethnographer/praxiographer out to investigate diseases never isolates these from the practices in which they are, what one may call, *enacted*. She stubbornly takes notice of the techniques that make things visible, audible tangible, knowable. She may talk bodies – but she never forgets about microscopes." (ibid.: 33)

In what follows the screen is the materiality through which the GP-patient relationship is being enacted. Instead of regarding the screen as a neutral source of information, the screen is thus considered an actor whose participation has consequences for the way social relations are played out in the surgery.

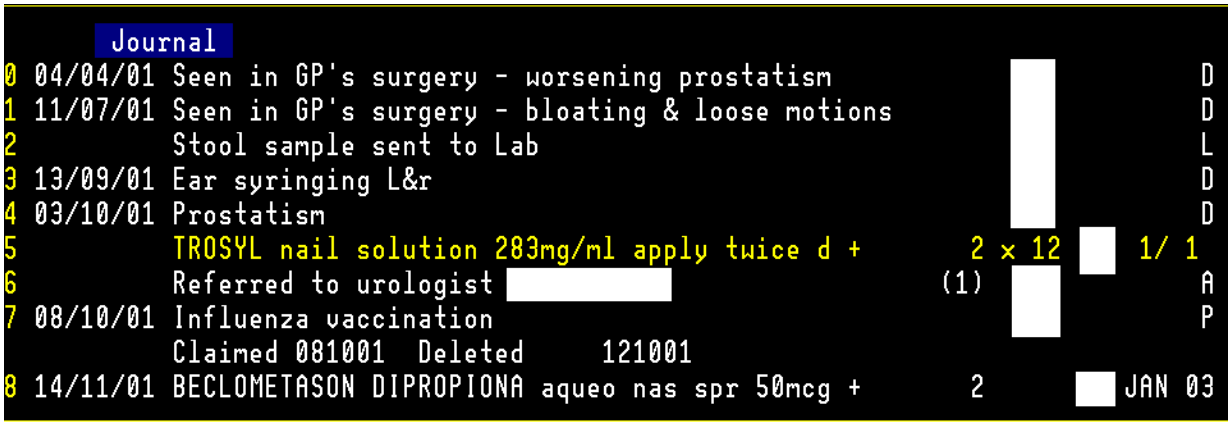
Methodologically, I have attempted to adopt a symmetrical view to the actors under study, even though when doing observations during surgery this was difficult. The reason for this is that interaction between patients and the GP is much more conspicuous than the subtle interaction between for instance the patient and the screen or between the GP and the screen. During observations I sat next to or behind the GP and tried to adopt a 'video-camera eye', i.e. I tried to describe and register activity without making interpretations before later on in the process registering what happened between the actors. Moreover, interviews with the GPs about how they experience working with an open and a closed screen respectively formed an important data source (see also Winthereik et al. 2002 and the introduction of the dissertation). The examples below stem from observations of and interviews with GPs from four different clinics located in Denmark, The

Netherlands, and the UK. I have chosen to treat the empirical material from those different countries under one frame, as the issue of working with a closed or an open screen was a concern all the GPs I studied had.

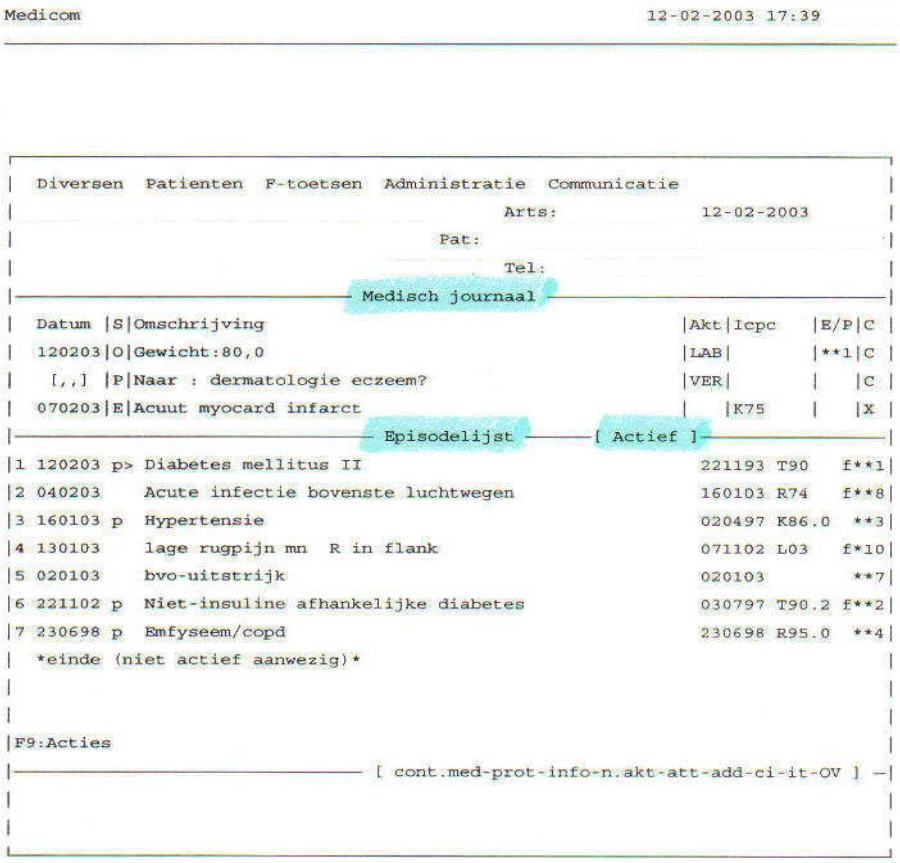
1.2.Information on the screen

Before moving on to the descriptions from the practices, it may be useful to explain what kind of information GPs and sometimes patients have in front of them during the surgery? Like a paper-based patient record, an EPR consists of various 'pages' containing different types of clinical information about a patient. The page, which most GPs have in front of them when seeing patients, is the page with continued notes, i.e. chronologically ordered data entries. On this page the date of the encounter, the headlines recorded during past encounters, and the diagnostic code whenever such one has been attached are listed. The exact layout of this page differs from system to system (see below), but all the systems have an entry screen with headlines referring to earlier encounters.

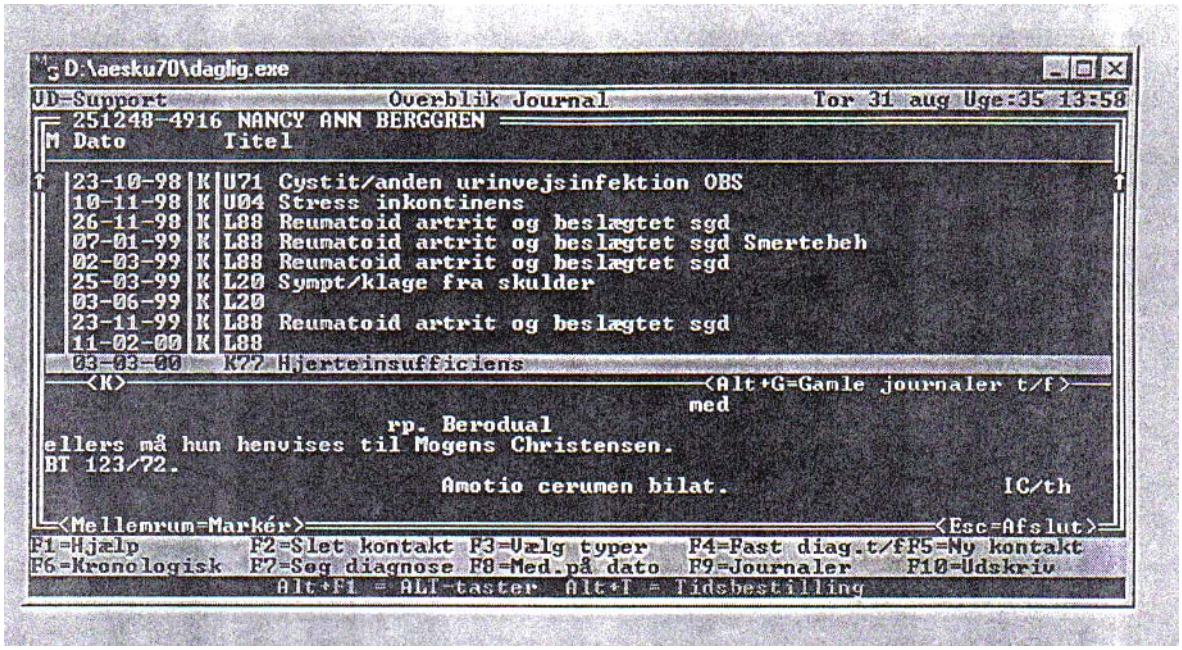
Screen (anonymized) from British EPR (Thorax Meditel):



Screen (anonymized) from Dutch EPR (Medicom):



Screen (test patient) from Danish EPR (Aeskulap):



Other pages that are frequently retrieved during surgery are the medication lists, various graphical overviews, e.g. a graphical overview of a child's height and weight, and test results, e.g. the results of blood samples. As the continued notes are usually retrieved before a patient enters the surgery, this screen usually forms the 'backcloth' of the conversation between the GP and the patient.

2. The GP-patient relation enacted

EPR-use allows health care professionals to do parts of their work differently; they prescribe medication differently (Svenningsen 2003: 211 ff.), they discharge patients differently (Ellingsen and Monteiro 2003), and they register patient information differently (Winthereik 2003). Allowing patients to view the screen may allow GPs to also communicate differently with patients. But what are the reasons for sharing information with patients when at the same time GPs feel they risk impeding the communication? One of the reasons for this - one that was mentioned to me several times - is that patients have a legal right to read what is contained in their medical record. Patients, therefore, should read what is written about them during surgery, some of the GPs argue. When information is visible during the surgery the GPs demonstrate that they respect patients' legal rights and that they have nothing to hide.

Other reasons given are that GPs find it authoritarian to work with a closed screen. Moreover, when the screen is closed they feel they have to spend time and energy to maintain the contact with the patients compared to when the screen is open. The contact with patients is extremely important for GPs, as they are constantly searching for ways of making their patients articulate about their condition. During my fieldwork in a Dutch GP clinic a GP and trainer of medical students repeatedly told me when observing his work: "The most important thing is to find out what is the question behind the question. What is the real reason for the patient to come? What lies behind?" Finding out what is wrong with a patient, is central in GPs' work. This may seem as banal point - isn't that the job of all doctors, to find out what is wrong with a patient? In some ways it is, yet, compared to specialists GPs see a lot of patients whose perceived problems lie within the range of what is 'normal', and GPs are often insecure about whether they do 'the right thing'.

Moreover, the way in which GPs find out whether something is normal or needs to be examined further by a specialist is primarily through conversation. A good conversation and tools to enhance this are therefore crucial for GPs.[3]

[3] Next to the conversation GPs have different ways of finding out what is wrong with a patient: knowledge about a patient's family history, minor physical examinations during surgery, the making of blood sample and other small tests.

2.1.Work arrangement one: When the screen is not visible for patients

During my fieldwork I met a number of GPs, who had placed their computers between the GP and the patient. In the following I give an example of such an arrangement to show how a GP attempt to control the effect of the EPR-use and communicate information to patients in a way that does not have any effects that were unintended by him. In Geoff's office the computer screen is facing the GP with its backside to the patient (see fig.1).

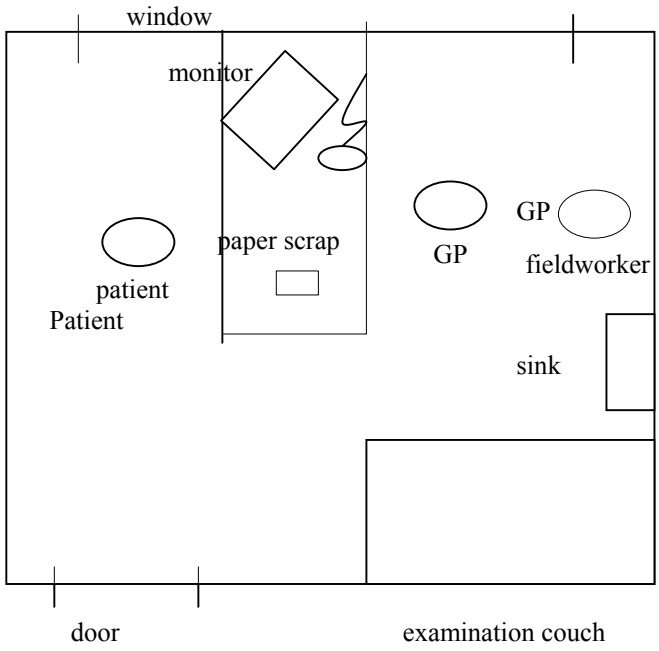


Fig.1.

Geoff seldom types while patients are present and whenever he wants to explain complicated things to patients he makes small drawings on scraps of paper. This does not mean that Geoff is a 'low-tech GP', who would rather be without the computer, quite the contrary. Geoff is very keen on everything that has to do with computers and spends a lot of his spare time improving the clinic's EPR. Geoff sees the computer as a helpful tool when communicating with patients, and describes how it offers the possibility of giving visual accounts of developments in blood pressure, weight and the like. Such accounts can be used to convince patients that their weight or blood pressure are abnormal and convince them that something has to be done, he says. Nevertheless, during observations I never saw him do this, and once during an interview where he wanted to show something on the screen I realized that the screen could not even be turned towards the patient's chair, as I had to walk across to his side of the desk.

As Geoff had told about how keen he was on computers, I had expected him to use the screen for sharing information during surgery. Instead, Geoff prints the information he wants to show to the patient and hands it over to him or her. During an interview he tells that he often prints Internet sites to patients to provide them with information about conditions specific to them:

> Geoff: "If a patient calls me to tell that he is going away on a trip and needs some immunizations I first look it up on the Internet, then I make a print, leave it at the secretary's desk, and wait for the patient to pick it up, think it over and call me to tell me what [vaccines] he wants. This saves me a lot of trouble, because I don't have to explain everything over and over again. Before [we started using an EPR] we looked up this kind of information in a book, but of course the physician who wrote it angles such a book. If you look at WHO's home site you get the official view and if you follow that you are sure to stay clear of criticism." (Interview GP, 2000)

Geoff uses the EPR and his Internet connection to provide information for patients that is up-to-date. He says that doing it this way saves him a lot of trouble. It is, however, only a specific kind of trouble that disappears, as it demands a lot of work for Geoff to be continuously up-to-date and to share information with patients, whether it is graphical information from the patient record or information from the Internet. Both sources must be made available to patients in a way in which Geoff does not risk that patients get unreliable information. Geoff thus does a lot of work to only show patients the information he considers the most reliable: instead of turning the screen towards patients he writes information off the screen onto a scrap of paper, and instead of offering a link to the patient, he prints the Internet pages and hands them over to patients.[4] In spite of Geoff's acts of translating information for patients, hiding the screen creates a patient, who is enacted as not being authorized to view what Geoff writes about him or her. The set-up makes this patient unable to distinguish relevant and reliable information from what is irrelevant and unreliable. At the same time, however, the patient is also enacted as somebody, who should be given clear and sufficient information and who is potentially powerful enough to criticize the information provided by Geoff.

[4] Geoff is online in his clinic so it would in principle have been possible to show the sites to patients during the surgery.

2.2. Work arrangement two: When the screen is visible for patients

Alison is another GP whose work I observed. Her computer screen faces the patient and she very consciously involves it in her communication with patients. Yet, she is also worried about the screen taking away the patients' attention. She explains how she tries to make the screen an occasion for on-the-spot sharing of information to inform and involve patients in their own case.

Alison has furnished her office in a way so that patients sit next to her, the computer screen being accessible to both her and the patient. She finds that this arrangement allows her to communicate better with patients. It has, however, made it necessary for her to start using the mouse with her left hand. When asked about this she explains that if she handles the mouse using the right hand, this hand will move between herself and the patient and 'wave away' the patient (see fig. 2).

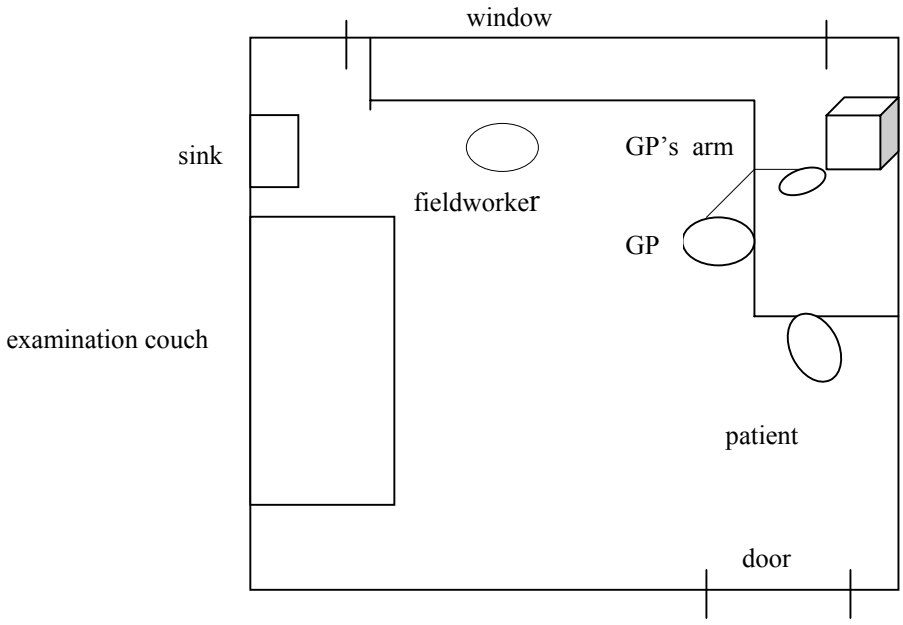


Fig. 2.

Is there no other ways of furnishing the office that makes this hand-switching operation superfluous? When asked, Alison replies that she prefers to have her things standing this way and that she does not find it a problem to have to use her left hand; she just does it this way because she likes it so. In spite of this evasive answer, it seems like her artful integration (Suchman 2002) of the computer into the work environment has its advantages when dealing with patients. Having the

computer placed like this enables her to integrate the screen in a way that she had not been able to had she furnished her office differently. Using the left arm to operate the mouse makes it possible to manoeuvre around the screen in ways that 'background' the presence of the computer. This is useful when - during consultations - Alison gets a phone call from the secretary that makes it necessary to retrieve the notes of a different patient than the one sitting next to her. On such occasions it comes in quite handy that she can 'shield' the screen so that the patient sitting next to her is unable to view the notes. The left arm arrangement thus enables the GP to *include* a patient and share the writings on the computer screen when necessary, but at the same time it allows her to *exclude* a patient to protect the confidentiality of another.

Alison in very subtle ways attempts to control a patient's access to what is written on the screen; she leans back and forth and uses the left hand to open or close the screen. But even when the screen is open there is no guarantee that a patient sees what she expects him or her to see. As an example of this Alison explained how, whenever she invited patients to view what was written on it, a specific piece of information on the screen would immediately catch their attention. This was their exact age written in years and days, for instance 63 years and 15 days, written on top of the electronic notes. The patient's reading of what was written on the screen whenever she intended to show him or her a test result was a matter of frustration to her.

This account from Alison's practice suggests that one of the reasons GPs feel an open screen is a double-edged sword is that patients may view confidential information, e.g. other patients' notes. It thus suggests that local work arrangements have to be thought of to make sure the confidentiality of the individual patient is safeguarded, but it also shows that even when patients are invited to look at the screen they do not always see what the GP expects them to see. The fact that patients should not view other patients' notes and that the GPs should be in charge of what they see is self-evident when working with a paper-based record but is challenged when working with an open screen.[5]

An example from another practice describes the kind of risk that Alison attempts to avoid and shows how responsibilities for who views what are redistributed when working with an open screen. The example comes from an interview with a GP called Martin. After having told the story he makes the point that as a GP one needs to be very attentive to make sure what is written on the screen does not ruin the trust between GP and patient.

[5] This does not mean of course that GPs using a paper-based record are fully able to control what patients see when they point to something in the paper-record. However, GPs may be more attentive as to whether alignment happens or not when they use an EPR, as they are already attentive towards how using an EPR affects the interaction with a patient.

Martin tells about an experience, which he describes as very unpleasant. Unwillingly, he had been about to disclose a piece of information that he had promised a patient not to disclose to her partner. Martin's patient had had an abortion, and she repeatedly told him not to pass this information on to her partner. Six months later the woman, pregnant again, came to see the GP along with her partner. Martin noticed that the woman had been quite tense during their conversation and only later he realized that her record, and thus the information he had promised to keep confidential had been visible on the screen all the time. In a former paper I use this example to argue how the screen may be seen as an ambiguous tool that is sometimes hard to control for GPs (Winthereik et al. 2002).

The example shows how the 'dangerous' piece of information threatens to 'jump out' from the screen and ruin not only the GP-patient relationship, but also the patient's relationship to her partner. On a later occasion I talk to Martin about this incident and ask him whether similar incidents happen often. He tells me that he cannot remember any other incident as unpleasant as the one described. It, however, often happens during pregnancy check-ups where couples show up together that it is hard to protect the woman's confidentiality. It is always her record that is visible on the screen, and even though she knows this in advance, the openness of the screen relocates the responsibility for protecting her confidentiality from the GP to the patient herself. She, not the GP, is now the one who should know about and take responsibility for the potential effects of the open screen.

One of the insights that may be derived from Martin and Alison's examples above is that working with an open screen has some unintended effects with respect to disclosing confidential information. GPs may take precautions like Alison did through her hand-shifting manoeuvre, which demonstrate how the open screen enacts the GP-patients relation as an unequal relationship. The open screen shows how, in spite of the GPs' wish to demonstrate to patients that they are open and anti-authoritarian, GPs and patients are not equal participants. The information on the screen does not mean the same to the different actors; even though the open screen indicates that the GP and the patient are both 'readers', obviously, they read in very different ways (Kay and Purves 1996).
A final example demonstrates how a GP uses the open screen to close off a conversation with a patient and affirm his own expert position. The field note below has been generated during an observation in David's office. In the field note it is shown how David uses the open screen to make his own point stronger.

> In comes an elderly lady. The GP has told me that she is one of his 'heart sink' patients. There is nothing he can do for her. He has had the same conversation with her for 5 years, he says. Once he tried to treat her for depression, but it had only a very little effect. Today she talks about her legs. She complains that she is not very mobile anymore. She says that she has been cut off from the world and that the phone company had closed down her phone line. All her friends are dead. She thinks it is very interesting that I am sitting there observing her, and in-between talking to the GP she makes additional comments to me about her condition. She asks the GP if there is any medication she can get. The GP says: "No, really, there is nothing we can do, it's your age". He leans back in his chair and shows her a screen with all her medication listed. Some of them are white, which means that they are the medications, which she currently gets. Others are yellow and 'inactive'. The GP gestures to the list and says: "Look, you've already had all there is." (Field note, 2002)

David has tried to explain to the patient that there is nothing he can do to help her. He has tried to help her with her legs, but she has already had all the available examinations. Obviously he cannot help her with what is really wrong: pay her phone bill or call her friends back to life. As a way of demonstrating to the patient that there is nothing he can do, David gestures to the screen. This way he communicates that he cannot or will not give her any more medication, and that he considers the conversation to be finished. The old lady does not understand what the colours on the screen mean, but accepts that she cannot get any more medication.

In interviews, other GPs confirm this double use of the screen as a way of indicating an open and democratic conversation while using it to end "pointless discussions." This resembles D. Silverman's point that a seemingly humanistic discourse can be coercive (Silverman 1987: 138). His examples of treatment of children with Down's syndrome show how patient-centred and authoritative discourses co-exist in practice. According to Silverman's analysis, patients' range of actual choices is confined within discursive and material boundaries. In spite of the democratic surface there is only a limited range of treatment options available for them. Likewise, the example above points to how, in spite of the intentions of establishing an open and 'democratic' conversation, the screen may very well enact the GP-patient relationship as an unequal relationship.

Despite the GPs' good intentions the open screen does not automatically ensure that the patient is enacted as competent and influential. Instead, it strengthens the GP's authority in various ways.

3.Conclusion

This study has illustrated how different work arrangements with the screen as participant enact the GP-patient relation differently. By way of empirical description it points to how GPs interact with patients by open and by closed screens. On the basis of the examples I argue that working with a closed screen is not necessarily impeding a patient-oriented approach, as in the example it stimulates the GP to translate information on the screen to the patient (even if the translation was informed by the GP's wish to 'stay clear of criticism'). Just as a closed screen does not have to be 'patient-*un*friendly', working with an open screen does not in itself guarantee a patient-centred approach. In the examples it was shown how working with an open screen carries the risk of disclosing confidential information. For this reason, and because GPs and patients, who read information on the screen do not see the same, an open screen does not save the GPs any translation work, quite the contrary. Deliberate translation is even more needed when the screen is open, as patients may either get the wrong information or 'get lost' in reading the screen without any guidance.

This insight is valuable in relation to initiatives to include decision aids in the GP-patient encounter, as such technologies are often used by an open screen. Often shared decision-support is made possible by a list of options based on evidence-based standards, which the GP and the patient can 'walk through' together. Recently, it has been argued that this may be a way of taking the patient's perspective more into account and a way of making the communication between doctor and patient more precise (Brennan and Strombom 1998, Stevenson 2003, O'Connor et al. 2003).[6]

Both the practices of working with an open screen and the arguments for shared decision-support assume that GP and patients are equal, or that they are at least potentially 'partners' in the identifying and treating a patient's problems. However, GPs and patients do not 'see the same', neither literally not in a more abstract sense and they may therefore not be able to share the responsibility for a patient's treatment as equals. The examples show that GPs and patients are not equal participants in the surgery as they do not align with the screen in similar ways. Equal

[6] O'Connor et al. talk about a therapeutic alliance between GP and patient. They say: "Ideally, the approach is patient-centered, in which the interaction is aimed at seeing the situation through the individual patient's eyes. It includes sharing power and responsibility based on a therapeutic alliance to reach an agreement about the problem, the options and the role in decision-making" (O'Connor et al 2003:736).

decisions are therefore not automatically made when introducing yet another 'voice', such as an open screen. The question is, however, whether inequality is necessarily a bad thing. Does leaving a decision by a patient always demonstrate a patient-oriented approach? As a patient may not be capable of choosing for a treatment demonstrating authority is not necessarily the opposite of being patient-centred. What is it to be patient-centred, then? Perhaps a patient-centred approach can be judged on the quality of the specific way in which a GP *mediates* the participation of the screen or a decision-support tool, not by his or her a priori understanding of the relationship as equal. Working in a patient-oriented manner thus implies that the ICT tool (screen/decision aid) is included in a way that does not assume that the patient and the GP are equal participants in the surgery. GPs and patients should thus be seen as participants whose relationship can potentially be transformed by the participation of the tools.

As the examples show the specific way in which the screen enacts the GP-patient relationship varies. Studying those variations empirically may thus offer further insights that can fruitfully inform discussions on what a patient-centered approach means in practice.

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