Ethnographies of diagnostic work
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Clinical reasoning and Diagnoses: the case of a national standard for electronic patient records in Denmark

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The relations between actions, representation of actions and problem-solving such as making a diagnosis have been under scrutiny in several interesting ethnographies. One of these is Julian Orr's book *"Talking about Machines. An Ethnography of a Modern Job*" writes about the how service technicians maintain and repair photocopies. The challenge of solving problems with photocopiers is a challenge of identifying what the problem is, finding a cause for the problem(s) and engaging in a strategy that will solve or make the problem go away. Representations, Orr argues, are produced by technicians whenever their activities do not proceed smoothly. Their knowledge and skill remain tacit, embedded in doing the job until they encounter a problem that is not immediately solvable. In these situations, technicians engage in the production of representations in order to identify problems and their solution: "The technician's task in diagnosis is to create a representation of the problematic situation that is sufficiently complete to indicate a course of repair. If the problem is known and recognized.... no representation will be formulated unless someone else asks about the problem." (Orr 1996: 115). If no direct information as to the cause of a problem, a diagnosis based on indirect cues, the sound that the machine emits while processing or kinesthetic feel of parts of the machine is attempted. These representations often take the form of narratives that technicians tell each other when they meet. Difficult problems often result in extended narratives that seek to summarize and present all available information in order to get at a diagnosis. Long chains of causality between components and assemblies of components are followed in the narrative, the challenge being to produce a coherent narrative that results in the identification of the problem, its cause and a strategy for repair (Orr 1996: p120). In some situations, however, this is not possible and instead the technicians engage in a number of

routine check that eventually make the problem go away without a proper diagnosis ever having being made.

The specific representations of action used by technicians are, in Orr's account, problematic, since the corporation for which they worked have produce manuals in the tradition of 'directive documentation': the manual prescribe the ways in which the technicians should gather information and proceed based on Yes/No answers according to a decision-tree. A kind of representation of the work that is unsatisfactory for the technicians, since part of their job of satisfying customers is repairing the machines, of course, but also to appear competent and knowledgeable in the view of customers. If they are just following a manual, why would the customer pay for their work? Moreover, however, the manual do not cover all problems that occur and in these cases the technicians have to engage in problem-solving based on their own understanding of the working of the machines and experience with repairing them. The technicians therefore have their own strategies for using the manuals: sometimes the follow the instructions, other times they disregard them and at still other times the use them selectively. The manuals are 'resources for situated action' (Suchman 1987).

The potentially problematic relationships between action, its representation and problem-solving resounds with the case I will present below. It concerns a standard for electronic health records (EHR) developed in Denmark over the last 7 years. The standard has been tested through the construction of several prototypes of EHR and the results are, at best, mixed. As I will argue, a central problem with the standard is how it represents the work of physicians, nurses and other health care professionals and the resources it subsequently makes available for them.

Representations of work and situated action

In "Plans and Situated Action" Suchman discussed the relationship between models of action, 'plans', and actual action in its temporal, spatial and contextual aspects, 'situated action'. As is well-known, she argues that "plans are resources for situated action, but do not in any strong sense determine its course" (Suchman 1987: 52). Plans are rational anticipations before the act and post hoc reconstructions afterwards. Suchman stresses the point that plans as resources for action are part of situated action and while plans do not determine action, empirical research into how plans are used and integrated in actual situated action is worthwhile and important (Suchman 1987:

188). This lead has been taken up by e.g. Schmidt (Schmidt 1997), amongst others, who argues that plans may have characteristics as *maps* that support orientation and overview - e.g. a 'to-do' list - or as *scripts* that provide a proscription for how to proceed - e.g. a sequenced check-list. A whiteboard listing patients, their diseases, location, associated nurses, and so on is useful for producing an overview, while a procedure for how to handle an acute heart attack provides a useful script for how to handle a critical emergency situation. Neither determines situated action, of course, but each provides different kinds of resources for action. Similarly, Bardram has argued that plans and schedules are useful resources for the situated planning that takes place in the work of clinicians at hospitals (Bardram 1997), and more recently, Rönkkö et al have investigated how software developers use schedules as resources for coordination when breakdowns in the usual flow of work occur (Rönkkö, Dittrich et al. 2005) (See also (Brown 2001)).

The relationship between plans and situated action becomes pertinent when plans as representations of work are embedded in IT artifacts. Hence, Bowers et al. describe the consequences of introducing a new system for the coordination and documenting work at a print shop: because the system was based on a model of work 'from without', which sequenced work and aimed at providing an account of the work for the external contractor, the system hindered multi-tasking, switching between orders, and so forth, procedures that enable a smooth flow of work 'within' the shop floor (Bowers, Button et al. 1995). Similarly, Heath and Luff describe the consequences of introducing a new IT-based record system for general practitioners: because the system prescribed a certain order in which to go through the record, separated formerly co-situated categories, and limited the length of entries, it did not support the actual practice of general practitioners consulting with patients. While the system was developed to support better records by providing a national database and ensuring precise data, it inhibited the work of general practitioners to the extent that they embarked upon an ambiguous strategy of working with electronic as well as paper-based records, with the result that neither were satisfactory (Heath and Luff 1996). Both cases can be linked to the distinction made by Sachs between two views of work: one the one hand an "organizational, explicit" view in the interest of accomplishing organizational accountability, and on the other hand an "activity-oriented, tacit" view (Sachs 1995).

There is, of course, no easy solution to the conundrum of how support, coordination, control and accountability should be balanced off between multiple considerations and the impingement of external parties. As argued by Bowers et al., informal, non-structural work should not a priori be cherished and formalization rejected: “If, for example, there are good organizational reasons for accounting for the work in new and more detailed ways, how are these to be balanced up against the requirements of smooth workflow in the shopfloor or in the office?” (Bowers, Button et al. 1995: 65). At the technical level, one solution may be to separate the aspects of coordination and organizational accountability and design technologies that visualize work as an ordered, coherent whole without directing or constraining it: “the role of the system is to *find and present* the order in the work, rather than, as traditionally conceived, to *prespecify and enforce* it.”, (Dourish 2001: 57). At a social level, calls have been made to engage in constructive working relations of technology production and use in order for developers and implementers to critically position themselves within and take responsibility for the process of producing new technology. Suchman argues that attempting to take a ‘view from nowhere’ is philosophically and practically impossible, and developing close relations with people, e.g. through ethnographic fieldwork, in order to know their work yet keeping a distance leaves design-decision at the mercy of external parties. She proposes instead to take a stance of ‘located accountability’ (Suchman 2005).

An inherent issue within the conundrum is how work is represented and subsequently embedded within information systems. Robinson and Bannon argue against a simple view upon depicting work and using that depiction for design; instead they aim at making “an analytic case against an objective reality that can be usefully "captured" in a model and subsequently used as a sufficient basis on which to develop a computerized system” (Robinson and Bannon 1991: 219). Representations of work are heuristic devices in design processes, and there is a pertinent danger when such representations pass through different groups and are used for different purposes: “The language of work is abstracted in a language of representation, useful to analysts. This is transformed again into an abstract formalism, chosen for its usefulness to the system implementers. The resulting system is then imposed on workers/users, taking a critical perspective, and changes the nature of the work that the representation was built on. This is a cycle that has clear potential for catastrophic

change via a positive feedback loop." (Robinson and Bannon 1991: 224). To the extent that different groups, 'semantic communities', are involved in analysis, formalization and implementation respectively, an 'ontological drift' may occur as the representation is interpreted differently by each group. A 'flip over' effect may take place, as one group's 'model of' work becomes a 'model for' work, and description becomes prescription (Robinson and Bannon 1991). This 'drift' and 'flip-over' effect cannot be done away with, they argue, and find comfort in the fact that the final interpretation will be made by the users and that the realization of that and of the 'drift' may itself change design efforts.

At a more general level, the visibilities and invisibilities produced in representation have been taken up. Representations, argues Suchman among others, are made for a purpose at a certain time and space by a certain group of people and underscore some aspects of work, while neglecting or leaving other aspect invisible. Representations cannot be fixed to any external 'truth' and we should therefore reflect upon how and why representations are produced and hence become more competent producers and users of representations. Furthermore, we may engage in cooperative design in order to construct representations of work with those whose work is represented and will bear the consequences of what is made visible and what is not (Suchman 1995). Such reflections and engagements will still have to balance different considerations, since the consequences of (in)visibility is not given: "On the one hand, visibility can mean legitimacy, rescue from obscurity or other aspects of exploitation. On the other, visibility can create reification of work, opportunities for surveillance, or come to increase group communication and process burdens." (Star and Strauss 1999: 9-10).

Representing clinical work: the standard for EHRs in Denmark

The National Board of Health in Denmark chose to develop a generic model of clinical work in order to arrive at a basic structure upon which to order information and which could be used by different health care professions and in the primary as well as in the secondary health care sector. Apart from the physical activities in health care, all clinical work, the National Board argues, entails the handling of large amounts of information in order to analyze and communicate. The board calls this

handling of information Clinical Process, and it has three levels: a mental, a conceptual and a computer science level.

The mental level is, the board readily acknowledges, difficult to depict with certainty. “To a large extent clinical information processing is not visible in clinical documentation as it is traditionally conducted in e.g. a medical record. It is a systematic approach performed by the practitioner in his or her own mind. In fact, this mental process is often executed at such a rate that the practitioner himself is hardly aware of each step of the Clinical Process.” (Asp and Petersen 2003: 3). However, through public hearings and discussions with and analyses by clinicians the board has arrived at an understanding of the mental level which, it is convinced, depicts the mental process adequately. The National Board of Health posits that the information processing going on in the mind of the individual health care professional is a special instance of the general model of problem solving. Hence, clinical problem-solving, i.e. the ‘Clinical Process’ can be depicted as involving the following steps: the clinician obtains information upon a patient’s situation; arrives at a diagnosis that defines the patient’s health problem(s); prescribes and plans examinations and/or treatment; and subsequently concludes the process by making an evaluation of the results of examinations and/or treatment. Having gone through this cycle, the health care professional may embark upon a new round of information-gathering, diagnosis, planning and evaluation.

On a conceptual level and in the wording of the National Health Board (See figure 1), Clinical Process includes at a generic level ‘Consideration’ leading to identification of a ‘Health State’ (encompassing e.g. the diagnosis of a physician as well as a care problem identified by a nurse). ‘Planning’ leads to ‘Health Activity’ (e.g. care activities, or prescription of treatment, medication or examination), the ‘Execution’ of which produces ‘Intervention Results’ that can be subjected to ‘Evaluation’ in comparison to ‘Operational Health Goals. BEHR (version 2.0) prescribes all ‘health states’ to have ‘Focused Information’ as their basis in order to document the reason why a health state was entered. Similarly, all ‘health activities’ must have a ‘health state’ as their indication in order to document why an intervention has been planned. A health activity must also have a stated ‘Intention’ to document the goal of the intervention. Notes attached to health states, health activities or intervention results are optional.

The purpose of the conceptual model of Clinical Process is, according to the National Board of Health, to enable a structuring of information that is better than the present structure of paper-based clinical notes and can be used for building an information system. The latter aim makes the board focus on documentation. The ´Wheel' in figure 1 is therefore expanded into a depiction of where different kinds of information and notes (e.g. diagnosis, planning, execution or evaluation notes) should be placed.

Figure 1. Visual representation of the interdisciplinary Clinical Process (Author's translation) From BEHR version 2.0. See (National Board of Health 2004)

In addition to the ordering of information according to the different steps, health care information is further ordered according to which 'problem' the information concerns: since Clinical Process is about problem solving, the patient record and hence BEHR should be problem-oriented. Problems, or in BEHR, 'health states', are also made central components to ensure continuity of care, since 'health states' can be singled out and followed across health sectors, departments and profession. The board explicitly ties BEHR to a way of ordering patient records that was proposed by US physician Lawrence Weed in the 1960s: Instead of ordering information chronologically or according to source (x-ray department, laboratory finding, MR-scan, etc.) a patient's record is ordered according to separate 'problems' identified by a physician or a nurse (Weed 1968). The suggestion by Weed was that a problem-oriented record would provide a better organized record and encourage health care professionals to think and act in a more scientific - e.g. problem-solving - way.

Finally, the computer science level entails description of information based use case, classes, and XML-diagrams which form the Reference Information Model.
On the whole, the model of clinical work in the BEHR can be characterized as cognitivist (Winograd and Flores 1986: chapter 2; Suchman 1987: 178): the focus is on logical information processing in the mind of an individual clinician set apart from the physical activities that are also part of health care. Clinical work is seen as the analytic decomposition of a patient case into separate problems which are dealt with consecutively. BEHR thus follows in the line of other clinical-decision support systems that seek to improve and rationalize medical work (Berg 1997).

Pilot-testing of BEHR: the County Prototype

As mentioned, the National Board of Health initiated a series of evaluations of BEHR through the development of different prototypes that were to test different aspects of the model. The County Prototype in focus where was tested in 2005 . It was partly developed upon the county's previous EHR, but remodeled to comply with BEHR, whose structure is reflected in the user interface (See figure 2).

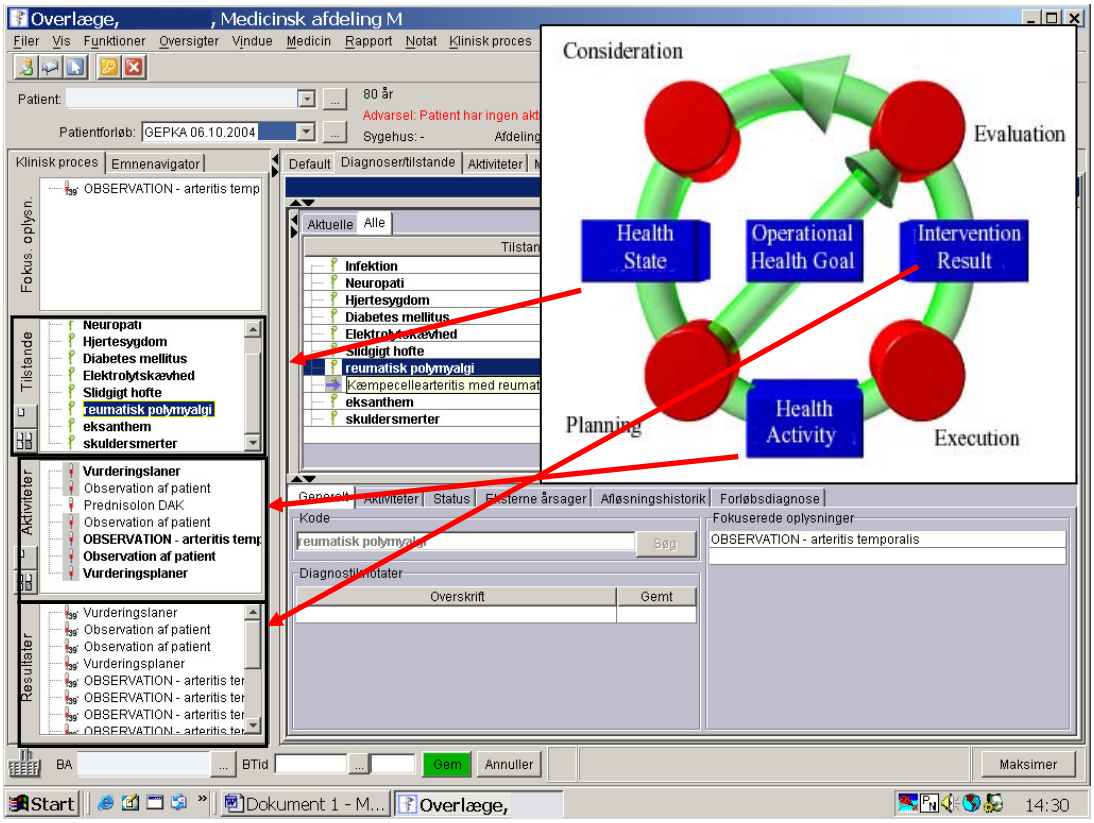

Figure 2. The BEHR model and its relation to the prototype developed

The core group of clinicians involved in the test concluded that the County Prototype did not support daily clinical practice. They experienced a fragmentation of patient cases and a critical lack of overview of patient treatment and care except in cases where patients had few and simple problems. They furthermore experienced difficulties in placing and finding information and spent more time documenting and reading records than previously. The core group of clinicians concluded that their troubles could not only be attributed to the County Prototype itself, but derived from characteristics of BEHR.

The fragmentation of patient cases is the result of patient cases being divided into a number of problems – called 'health states' in BEHR – which make an overall assessment of a patient's situation difficult. Instead of having the most recent summary of the patient's situation available, as in the old, chronologically ordered record, the clinician is now presented with a list of 'health states' and 'health activities' (see figure 3 below). While problems can be placed in a hierarchy, possible interactions of 'health states', for instance, cannot be shown, and hence interrelations between these have to be dealt with in the mind of the clinicians or, as also happened, by making notes on a piece of paper. Similarly, information about plans and examinations are ordered by subsuming them under a problem, hence making an overview of all plans and examinations difficult.

The loss of overview is exacerbated by the difficulty of placing and finding information. A thorax x-ray may be prescribed and put under the health state 'pneumonia', while also being relevant for the health state 'cardiac problem'. The clinician therefore has to decide whether to put the information under 'pneumonia' or 'cardiac problem' or both. They may place the information under the health state they consider most appropriate (e.g., 'pneumonia') with the inherent danger that it may be overlooked when another health state is dealt with (e.g., 'cardiac problem'). Alternatively, they may place identical information under multiple relevant health states (e.g., 'pneumonia' as well as 'cardiac problem') with the hazard of producing a redundancy of information. Such a redundancy of identical information means more work for the clinician reading through the record and remembering and comparing what was seen and what was not seen. Again there is the danger of losing overview.

The problem of where to place information was especially acute for the nurses, since their tasks often did not fit smoothly into BEHR. Tasks such as 'personal hygiene' are

not done based on any specific diagnosis, and specifying ‘focused information’ (e.g., “patient needs to be washed”) as an indication of such a ‘health activity’ bordered, they thought, on the absurd. Likewise, other tasks such as giving a mild painkiller might not result from any specific problems, but from a patient feeling anxiety or, in general, uncomfortable. To give the tablet, a nurse would either have to choose one or all ‘health states’ as an indication or enter new ‘focused information’, e.g., “anxiety”.
Stricter requirements for documentation in BEHR caused extra work in addition to the extra work resulting from the problems of finding and placing information and establishing an overview. In BEHR, every health state and health activity must have documented ‘focused information’ as its indication. With many health states and health activities this requirement is sensible, since diagnosis and interventions should of course be based on a reason. The requirement, however, also applied to departmental routine activities such as taking a patient’s temperature, blood pressure or pulse. With BEHR, however, such interventions are required to have ‘focused information’ or a ‘health state’ to be documented.
Imagine, for example, a patient having a rash because of urinary incontinence. In the old records, this could be entered as “rash because of urinary incontinence”. With BEHR, the physician is required to enter ‘rash’ as ‘focused information’, then to enter “urinary incontinence” as a ‘health state’, and subsequently to link the focused information “rash” with the health state “urinary incontinence.” To document the application of a cream to treat the rash, a clinician could in the old record enter “cream XX applied because of rash due to urinary incontinence,” but in BEHR he or she is now required to perform the steps listed above, then enter the health activity, “Application of Cream XX,” and finally link this to the health state, “urinary incontinence.” Thus, BEHR entails more documentation work because of the requirement that all health activities and states be linked to focused information and because BEHR breaks down the documentation into separate pieces of information that have to be entered into categories and subsequently linked.
The core group of clinicians concluded that BEHR led to more work, loss of overview, and fragmentation of a patient’s situation. While BEHR might reflect how they processed or ought to process information, it did not make needed information resources available for them in their practice. They recommended that source- (x-ray, laboratory results, MR scans, etc.) and time-oriented (chronological) modes be incorporated in BEHR as complementary to the problem-oriented mode of ordering

information. This was necessary, the clinicians argued, in order for them to see whether, for example, a thorax x-ray was prescribed and would not be ordered again because it was also required in connection with the problem listed as a “respiratory problem” as well as the problem listed as a “heart condition.” A chronological overview would furthermore make it possible to have an overview of the latest prescription and summaries. While the problems of fragmentation, loss of overview, and additional work were not pertinent to simple patient cases, the difficulties were marked with patients who had multiple problems and were admitted for longer periods of time.

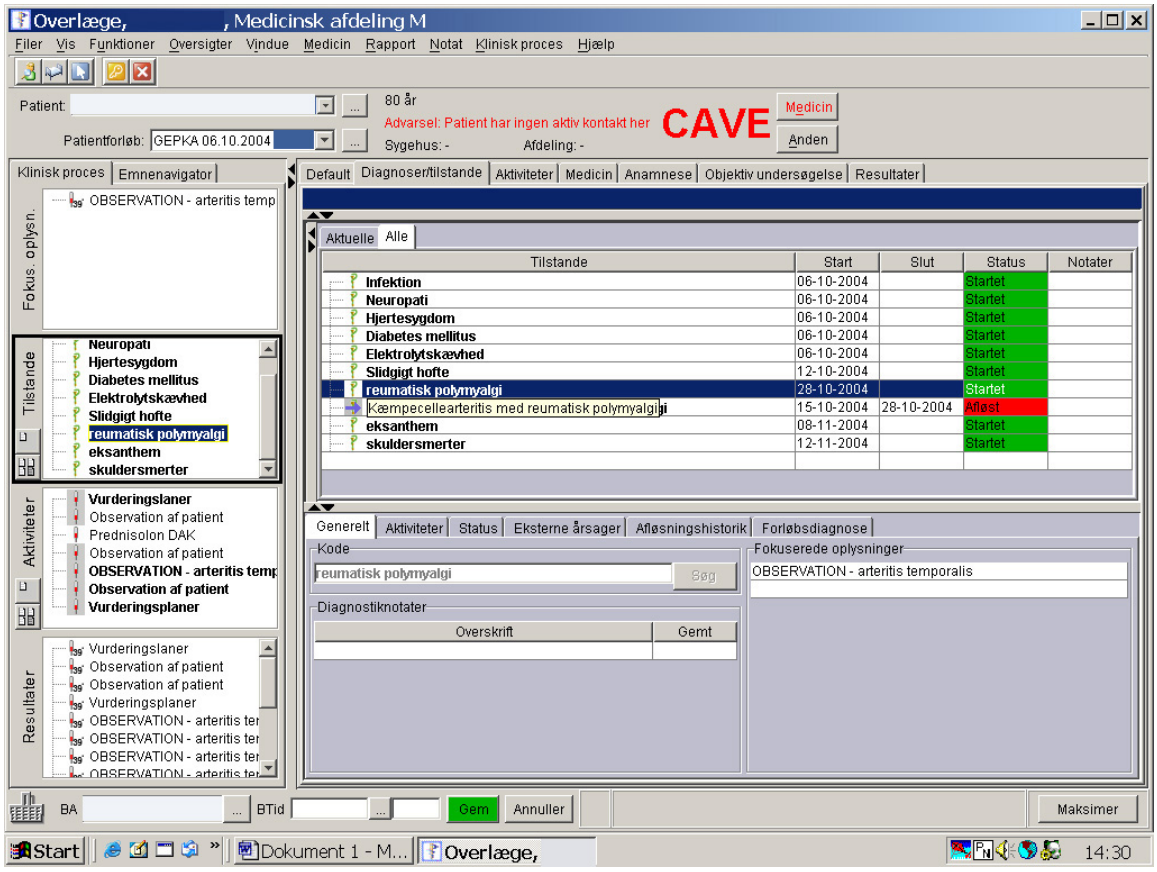

Figure 3. Health state hierarchy. Over a one-month period 10 health states have been entered. A health state can be marked and all associated activities listed.

The representation of clinician work in BEHR and its problems

BEHR depicts clinicians as problem-solving individuals within the clinical domain and asks them to provide rational accounts of their assessment of a patient’s situation through the ‘Wheel’s sequenced, reasoned steps. A patient’s situation is broken down into separate problems and information ordered accordingly. The aim is to establish a standard for EHRs that can facilitate the continuity of care across professions and

sectors, the exchange of data between different EHRs, and the submission of information to a national register, as well as to support clinical work. Coordination and accountability of health care is purportedly achieved by making problem solving the essence of clinical work, and the aim of the National Board of Health is to make submission of information to the national register an "unremarkable byproduct" of clinical documentation. In addition, BEHR apparently also seeks to make clinicians produce more reasoned and documented accounts. The evidence from the test of the County Prototype suggests that this entailed problems for clinicians.

The board argues that BEHR "relates closely to real-life situations in the domain of healthcare" (Asp and Petersen 2003: 6), but it can be argued that this is only partially true. Though what exactly goes on in clinical work and especially in the minds of e.g. physicians and nurses is disputable, one depiction can be found in the work of Alvan Feinstein (Feinstein 1973; Feinstein 1973; Feinstein 1974). According to his representation, clinical reasoning consists of finding and assessing information of multiple kinds and from different sources and based on this construct a coherent account of the patient's situation. A physician may read the patient record, read the lasted examination results, talk with and examine the patient, consult the nurse providing care for the patient, the physician with whom the patient spoke yesterday, and so on.

Based on this, he or she will attempt to produce a coherent account of the patient for further treatment and care. Clinical decision-making in Feinstein's depiction can be divided into two phases: In one phase, the clinician gathers information and identifies problems by surveying a wide variety of data such as information about former diseases, physical observations, examinations, and oral accounts. The challenge is, on the one hand, to construct a coherent overview that establishes meaningful and valid relations between information about symptoms, complaints, and examinations and, on the other, to relate this general idea to a diagnosis. A process that involves valorization information and filtering out some information at the expense of other information. This process of information gathering and problem identification can to some extent be performed systematically, but the way in which a clinician constructs a coherent overview of a patient's case remains in part tacit or implicit. In the second phase, a rational account of the patient's situation is given. Hence, clinical decision-making certainly has rational aspects, but there is a crucial difference between the

phase where diagnoses *have yet* to be made and the phase where diagnoses *have been* made. In the latter case, rational relations between information, diagnosis, plans, and subsequent evaluation can be made and accounted for by documentation. In the former, there is a need for widespread information gathering and scanning and filtering of information before coherence can be constructed. BEHR supports documentation, but not information gathering and problem identification. The demand made by the clinicians at the department of internal medicine for source- and chronologically organized patient records should be seen as a response to this.

In addition, BEHR may possibly also mainly be adequate for the work of physicians. As mentioned, nurses often found it difficult to place information in the County Prototype because their health activities were often related the patient's situation as a whole and not to any particular problem. The nursing profession is currently debating whether it should become more evidence based and hence achieve a more scientific approach to nursing, or maintain its traditional holistic and phenomenological orientation. For nurses adhering to the latter approach, BEHR does not seem adequate, while nurses striving for evidence-based case may embrace it.

Like the EHR described by Heath and Luff, BEHR is "a disembodied, retrospective account of the consultation, rather than an integral feature of the accomplishment of diagnostic and prognostic activities" (Feinstein 1974: 363). The representation of the patient's situation is a *post hoc* reconstruction that seeks to anticipate rationally the next round of situated practical clinical reasoning. The evaluation from the test of the County Prototype suggests that BEHR does not have the characteristics of a plan that would be an adequate resource for the first phase of practical clinical reasoning. BEHR builds on a partial representation of clinical work, which is turned into a plan for that work, instead of being built on the question of what kind of resources clinicians need when seeing patients and perform situated clinical reasoning.

The argument made here is obviously neither that there should be no rational reasoning behind the construction of a patient case, nor that there should be no post hoc account of that reasoning. As a description of the reasoning behind clinicians' prescription of treatment and care, few persons, if any, would be without the accountability produced in the patient record. Furthermore, patient records are crucial for the coordination of clinical work and accumulation of information about diagnosis and care (Berg 1999). As modern hospitals have developed with their specialized technologies and departments, the need for the coordination and communication of

information well beyond co-located actors has developed, necessitating, in turn, the development of patient records that are structured and provide meaningful information to remote collaborators, i.e., as ‘boundary objects’. Rather, the argument is that BEHR is only a partial representation of the work of (the physicians’ group of) clinicians and that it does not provide an adequate resource for that work.
The partial representation of clinical work results, I would argue, from the fact that coordination and exchange of information in BEHR is based on the ‘universal’ problem-solving method applied to health care. As Jean Lave and others have shown, however, problem-solving is often an embodied process of interacting actors using physical artifacts and their environment (Lave 1988; Kirsh 1995). The cognitivist model of problem-solving is hence rather a disembodied and decontextualised abstraction than a universal model. Moreover, even from the narrow perspective of clinical decision-making represented by Alvan Feinstein above (Section 4.1), BEHR only partially represents clinical work. From a more ecological approach, clinical work and knowledge production can be argued to be the result of processes dispersed in time, space and personnel, instead of single acts bounded in time and space undertaken by individual clinicians (Atkinson 1995).

Concluding perspectives

Commenting on the work of technicians, Orr writes:

"The stereotypical view is that service is about fixing identical broken machines, and the technicians do indeed work on the machines. They must diagnose and repair the problems of the machines, as well as maintain and adjust them. In all of these activities, and perhaps most critically in diagnosis, the technicians must understand the machines. Understanding the problem determines what is to be done about it, but that understanding is created from an assortment of information that does not necessarily point to a single diagnosis. The practice of diagnosis is done through narrative, and both diagnosis and process are preserved and circulated among the technicians through war stories, anecdotes of their experience. This, however is the view of an ethnographer observing diagnosis as it is done. The corporation has a different view of the work, including diagnosis, the gist of which is that the technician needs to understand little more than how to follow the directive documentation furnished by the corporation" (Orr 1997: 104-5)

The problems encountered by the clinicians with BEHR are, of course, different to those of Orr's technicians. The clinicians are in a much stronger position in the organizational hierarchy and their work relies on their expert knowledge - though many clinicians would argue that they face the same problem of having to follow directive documentation in form of guidelines and protocols. The point I would like to make here, however, is Orr's contrast between the ethnographer's and the organizational view upon work and his implicit suggestion that the former is more adequate than the latter. Looking at how clinicians make diagnoses does seem in an obvious way to show that making diagnoses accord to more than mental acts of problem-solving (Figure 4, below).

Figure 4: Making the medical round and doing diagnoses as a cooperative venture involving various artefacts. Nurse, physician, a host of journals and trolley.

However, an intriguing aspect of the development of BEHR as a standard for EHRs is that the National Board of Health engaged in a process which had strong elements of cooperation with clinicians. They have been involved in its construction from the start: the problem-oriented approach to patient records was proposed by the US physician Lawrence Weed, clinicians at the National Board of Health elaborated his ideas to become BEHR, and clinicians have been involved in the subsequent debate

about and testing of the standard. Public hearings and workshops including clinicians, hospital managers were arranged from the start in 1999 and BEHR has been tested through the development of prototypes based on the standard. Many physicians and nurses at the department of internal medicine responded to BEHR and its 'wheel' (Figure 1) with 'that is actually how we think!' As it turned out in the test, it might be the case that clinicians think as BEHR describes it, but they do not work in such a way. BEHR does however present a mode of representing clinical work that corresponds to what physicians (and to some extent nurses) are taught: they should think and work in a rational 'scientific' way. So rather than power being the reason for a representation of clinical work that is in accordance with an organizational, explicit view, the reason seems to be the dominance of an abstracted way of representing knowledge and action within the medical, computer science and bureaucratic professions.

To me this implies that doing ethnography of diagnostic work is not enough, since the result may be representations of work like those of BEHR. Achieving an understanding of the work of problem-solving also implies critical reflection on theory and the modes in which we conceptualize action and our use of the artifacts that we use.

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