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The Use of Narratives in Medical Work: A Field Study of Physician-Patient Consultations

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Abstract. Medical reasoning involves more than just summarizing clinical data and guidelines. Illness trajectories of chronic patients are often long, complex and full of uncertain information that requires interpretation. Understanding the complex interrelations is an important aspect of medical reasoning that displays narrative rather than scientific characteristics. While the qualities of the medical record as a repository of information or as a coordinative tool are well known, the role it plays in the unfolding of narratives in medical reasoning is less discussed. This paper examines this issue through a case study of patient consultations that take place as part of a distributed treatment of chronic heart patients. We found that the record, even though fragmented and to some extent incomplete, enables the physician to construct an *ad hoc narrative*. During the actual consultation, physicians and patients unfold a more detailed narrative, which we refer to as the *re-emplotted narrative,* that includes additional information and entails a collaborative exploration of uncertainties. While this may point to some inadequacies of the medical record as a supportive tool for the process of unfolding narrative, we suggest that is it in fact a crucial component of the medical reasoning activity that must be considered in design of supportive systems.

unfolding of narratives (Conelly, 2005), much less has been reported on how the diverse clinical and narrative information stored and conveyed by medical records, is used in practice. This is however highly relevant for design of electronic patient records.

As argued by some (Arminen and Poikus, 2009; Hartswood et al, 2003), the design of medical systems is often based on flawed or overly simplified assumptions about the nature of clinical practices creating a mismatch between the presupposed and the actual use of a given system. Often technical solutions are posed as answers to inherently socio-technical problems (Hartswood et al, 2003). One common misconception, as argued by Paoletti (2009) is that information is *out there* to be used and processed in a linear diagnostic process, rather than being narrative information that require interpretation.

The study presented here examines the use and role of medical records in the collaborative unfolding of narratives at patient consultations. We examine this in the context of patient consultations taking place as part of the distributed treatment of chronic heart patients in Denmark. In this study, we are interested in developing a more detailed picture of how records are brought in play and how different kinds of content, clinical evidence and narrative information, affect the medical reasoning taking place.

The paper is structured as follows: In the following section, we elaborate on the concept of narratives in healthcare and related research on medical records. Next, we present our field study of consultations of chronic heart patients at a local hospital. We finally discuss how and to what extend the record support the narrative component of medical reasoning at patient consultations.

Background

Narratives in Clinical Practice

> "Despite all the prohibitions against 'anecdotal knowledge' in medicine, case narration is the principal means of thinking and remembering – of knowing – in medicine. The interpretive reasoning required to understand signs and symptoms and to reach a diagnosis is represented in all its situated and circumstantial uncertainty in narrative." (Montgomery, 2006:46).

The notion of narratives is increasingly recognized as an influential concept in helping us understand reasoning processes, interaction and information sharing in healthcare settings. The concept has been applied at multiple levels of analysis. Recently, Hayes et al (in press) applied *narrative networks* as an alternative analytical lens to traditional workflow diagrams, to foreground how interrelating *narrative fragments* of many multiple stakeholders constitute a network that goes beyond the view of the individual healthcare practitioner. Some studies have

and according to Mattingly (1998) a narrative is often made through the combined efforts of all players, with the therapist in charge.

The Role of Records in Clinical Practice

Medical records are often thought of as a document containing all patient related information within an institution. They were initially introduced as educational tools, consisting of loosely structured descriptions of particular cases, authored retrospectively using a free-from narrative style (Siegler, 2010). The medical record has since evolved to be a highly formalized and structured document used actively in patient care. However, the medical record is far more than a single repository of information. As argued by Berg and Bowker (1997), the record consists of multiple bodies and is constituted by:

> "(…) all written, typed, or electronically stored traces of any aspect of patient treatment that has official status within the hospital system and is in principle stored for a period of time (at least equal to the patient's stay in the hospital" (Berg and Bowker, 1997:515).

This fragmentation of the medical record may be a product of increased complexity and a tendency towards distributing treatments across multiple, specialized healthcare providers, typically referred to as *shared care* (Pritchard and Hughes, 1995) or *integrated care* (Kodner and Spreeuwenberg, 2002). One strategy to meet an increased demand for collaboration across professional and organizational boundaries is to improve design of Electronic Medical Records (EMR). Winthereik and Vikkelsø (2005) argued that EMRs are important change agents that can help satisfy a growing interest in organizing care along the specific patient cases, rather than along organizational boundaries.

According to Berg (1999) medical records fulfill two important roles: They both accumulate information, and coordinate activities. The coordinative role of EMRs has been of major interest in CSCW research. Østerlund (2002) studied how records are used to convey information within and across organizational boundaries. Reddy et al (2001) studied the EMR as a *Common Information Space* that serves as an important resource of coordination among heterogeneous, physically co-located actors because of its ability to de- and re-contextualize information. Munkvold and Ellingsen (2007) have studied the benefits and limitations of Common Information Spaces to form links between the disconnected trajectories of different organizations along the overall illness trajectory of a patient.

While medical records fulfill a crucial role as coordinative artifacts, they also fulfill another – and just as important – role as "tools to think with". In other words, they act as artifacts that underpin the process of medical reasoning and facilitate the exercise of clinical judgment. Østerlund (2008) argued that records are important tools by doctors and nurses in their sensemaking activities. Some

Methods

We used multiple methods to develop a rich picture of the use of records medical reasoning at patient consultations. The study involved a combination of observations, interviews, document and system studies and design workshops, conducted over a period of approximately 12 months. The observations were conducted over a two-day period where one researcher shadowed a physician conducting patient consultations. As part of the observations, the researcher conducted several informal interviews with the physician focusing on specific aspects of his practice, documents, and systems. We also examined the documents and the systems by conducting video-recorded walkthroughs in situ and by collecting and analyzing five full sets of progress notes from the medical records of ICD patients. The five design workshops, each lasting 2-3 hours, involved five physicians, representing two hospitals involved in ICD care, and five designers and researchers. The overall purpose of the workshops was to explore current practices and to develop concepts and prototypes for improving support of distributed ICD care. One central activity at these workshops was discussion and mapping of the current work practices and the information systems in use.

All consultations were audio- and video-recorded and were fully transcribed. All data have subsequently been categorized and analyzed through open coding and axial coding (Strauss and Corbin, 1998).

Participants

This paper focuses on medical follow-ups conducted at the local hospitals. The main participant in the study is a physician who we observed while he was conducting medical follow-ups. The physician is a trained cardiologist and is one of the leading specialists in ICD care at this particular hospital.

The patients involved in the study all suffer from chronic, severe heart arrhythmia. Approximately half of the patients have an implanted ICD device, while the others either have been or are considered potential ICD candidates. The group includes young patients in their thirties as well as middle-age and elderly patients. Their physical as well and mental capabilities varied from being severely impaired to being relatively well-functioning. Furthermore, some of the patients suffered from other chronic conditions, such as diabetes or COPD (Chronic Obstructive Pulmonary Disease). Although some of the patients attended the consultation individually, most brought a relative and/or a translator.

Tools

At the patient consultations, the physician has a broad selection of paper and IT-based information systems at his disposal. The backbone of the information infrastructure at the local hospital is a paper-based patient record, a cross-

due to the patient's hypertension. The patient' EF value was 10 the last time it was measured. The physician furthermore found a medicine list in the record. Finally, the physician learned that the patient hadn't recently received ICD therapies.

The record provided the physician with a general overview of the history of significant events in the illness trajectory. Also, more specifically, it pointed out the treatment with beta-blockers as an area of concern that he should attend to during the consultation. During his preparation, the physician would usually take short notes on a printout of the scheduled consultations. This annotated printout came to represent his summary of the patient's illness trajectory.

When prepared, the physician calls the patient to his office. During our observations, the physician most often initiated the consultation by first highlighting his understanding of the patient's condition and then asking a set of routine questions.

The physician initially told the patient that he had read his record and medicine list, and that he could see that the patient had been very ill, but also that his condition had improved. He then commented that the patient didn't have shortness of breath from walking to his office. The patient confirmed this and furthermore told the physician, that he can walk around effortlessly, unless the weather is cold. The physician also asked and received confirmation that the patient did not experience chest pains. Finally the physician told the patient that he could tell from the record that the medicine the patient was taking was working well.

The questions asked by the physician are important for his assessment of the patient's condition. As part of this routine, the physician also measures the patient's blood pressure and pulse and on some occasions conducts other forms of physical examinations. After these initial steps, consultations can proceed in a variety of ways. Often, the physician's questions will unveil symptoms or conditions that need further examination. On other occasions, they trigger the patient to tell the physician about his own experience or concerns.

During the conversation, the patient told the physician that the beta-blockers caused strong side effects. He stated that he experienced fatigue and troubled bowel movements from the particular beta-blocker he was taking, drug A. He furthermore expressed strong concerns that his body couldn't tolerate all this medicine. Because of the patient's discomfort, the physician suggested replacing drug A with another beta-blocker, to which the patient reluctantly agreed. The physician first suggested drug B. The patient, however, recalled that he had already previously tried this drug and that it too had strong side effects. This pattern repeated when the physician suggested drug C, although the patient said that it had been a long time since he had tried this drug. The physician suggested that he try it once more, because his body might have adjusted to the new situation. After some consideration, the patient agreed to try drug C again.

As is often the case during consultations, the patient pointed out a relevant issue – what particular drug to use – that needs to be addressed. Furthermore he provided the physician with information that was highly relevant for physician's medical reasoning, namely that the medication adjustment attempts were not only affected by his physical problems but also by his experiences with the side effects. The patient also provided the physician with a historical account of the types of drugs that had taken previously. In this case, this information and

Due to the chronic condition of ICD patients, and the fact that patients with chronic heart arrhythmia often suffer from other chronic illnesses, the medical records often contain large number of pages. The same is true for the other systems where patient data are registered. The challenge for the physician during the consultations is to identify relevant elements of the patient's illness trajectory and through emplotment construct a narrative that explains relevant causal relations. This narrative is highly context dependent and we refer to it as the *ad hoc narrative*.

In the following sections, we highlight how the ad hoc narrative emerges within the medical follow-up. First, we examine how narratives reside in the medical record, and then demonstrate how the narrative is unfolded during consultations.

Narratives in the Medical Record

The multiple documents and systems that constitute the medical record used during medical follow-ups reveal the complex nature of medical reasoning. Due to the scientific component of medical work, a substantial amount of the information stored in the record can be characterized as clinical evidence. The paper record will for instance often contain a printed echocardiogram and extensive medicine lists, while adjacent IT systems such Labka and www.icddata.dk, respectively, contain results from laboratory tests and highly condensed information, primarily numeric, describing the functioning of the ICD device.

The progress notes in the paper records, one of the more prominent components in use at the medical follow-up, displays more narrative properties. Since progress notes are dictated after every contact with the patient, they can vary greatly in format and content depending on the author and particular issue dealt with during the consultation.

Some progress notes contain very concise data on the patient's current condition and state of the treatment. This type of progress notes report on a narrow set of issues concerning the particular consultation:

> As of today, patient attended a consultation with a nurse in the heart failure clinic.
> The patient's son took part in the consultation.
> See HjerterPlus under standard forms.
> Blood pressure 120/60. Weight 65,9 kg NYHA 1.
> Pt is in a good state of health.
> Plan: Cres Caps. Odric 2mg x 1 vesper.
> Ct. other medicine unchanged.
> Pt. have appointed with physician at 8/10 09.
> Pt. gives consent to the above mentioned.

However, some progress notes have a more narrative character and reveal fragments of the patient's past illness trajectory, particular findings that influence

Unfolding the Narrative

The main objective of a patient consultation is to adjust aspects of the treatment to improve the patient's condition. A significant aspect of this is the physician's attempts to make sense of the patient's current condition and identify relevant aspects of the past illness trajectory – which we refer to as *unfolding the ad hoc narrative*. During our study we observed that this emplotment process happened in two stages: Prior to the consultation the physician constructed a *proto-narrative* – a narrative based solely on information found in the medical record, either clinical data or textual narratives. During the consultation the proto-narrative was corrected or refined through physician-patient interaction – what we refer to as *re-emplotment*. An important resource during re-emplotment was the *patient's narrative* – the patient's own configuration of significant events and experiences from his/hers illness trajectory. In the following two sections we elaborate on these two observations.

The Proto-narrative

Before a consultation, the physician began to read the progress notes in the medical record, and explained to the researcher:

> "We have a nineteen hundred pages record here [presumably an ironic exaggeration]. I can't remember that I've seen him before. Okay. There is a note from December where we have summarized a bit. December 08, more than a year ago. There is also a very good summary if we go back to March 08." (Physician)

During his preparations, the paper record, and in particular the progress notes are important resources for the physician. According to the physician, he will usually first look through the most recent progress notes in search of a summary, since it will provide him with a relatively thorough overview. Summaries are, however, often not available or too old to provide information on more recent developments. In those situations, the physician instead has to construct the proto-narrative from the often more fragmented short progress notes based on previous consultations and hospital admissions. Depending on the particular situation, he may also use one or more of the dedicated IT systems or databases. In this way, he is able to construct an overview of the more significant events in the patient's illness trajectory. When constructing the proto-narrative, the physician configures a plausible narrative from often incomplete, ambiguous, and even contradictory information from multiple sources. In this process, the physician seeks to find answers to questions such as 'what happened, when, how and why?' He furthermore identifies significant events and makes decisions on which information to include, exclude, stress, or subordinate. Finally, he arranges events in a certain order that implies a particular causality.

The physician stated that he would prefer to have this proto-narrative prior to the actual consultation. However, he can also construct it while the patient is

require adjustment of the medicine. The patient stated that the medicine was not adjusted at a recent consultation with a nurse, and he did not believe that she had taken this into consideration. Since neither of the systems available at the office provided information on this consultation, the physician had to leave the consultation, to procure the nurse's record, which is a separate document. When he returned approximately five minutes later, he had clarified that the responsible nurse was in fact aware of the high blood viscosity, and that the medicine had been adjusted accordingly. They did, never the less, agree on a slight adjustment to the medicine.

In this situation, the re-emplotted narrative included perspectives from the medical record and the patient's knowledge and concerns. It also came to include perspectives, rationalities and causal explanations of healthcare professionals, who were not present or directly represented through any parts of the medical record. The patient's narrative thus pointed out areas of concern that required elaboration.

During the consultations, we observed that the re-emplotted narratives provided the physician with relevant information that initially had been missing in the proto-narrative. The consultations also involved a collaborative exploration of information that was inaccurate or missing. This narrative re-emplotment is therefore not only about filling out information gaps but involves a set of interactions where parts of the story are further explored, specified and reshaped. This adds a layer of social interaction to the medical reasoning activity.

After all medical follow-ups, the physician dictates a new progress note that is later be transcribed by a secretary and placed in the medical record. Apart from a medicine list, a set of diagnostic codes, and information about the decisions made at the medical follow-up, this progress note contains a brief summary of the physician's view of the patient's illness trajectory. In this way a textual narrative is created on the foundation of the ad hoc narrative unfolded during the consultation. This textual narrative may potentially become a resource for unfolding ad hoc narratives at future consultations.

Discussion: The record as supportive tool for unfolding of narratives

Our studies of medical follow-ups show that while clinical facts and guidelines play a crucial role for the outcome of consultations, many decisions rest upon a far more complex process of medical reasoning. For instance, medicine prescriptions are highly influenced by clinical guidelines for chronic heart patient care, but involve other considerations as well, e.g. contextual factors such as other health related conditions as well as observations and interpretations from other healthcare professionals. A prerequisite for medical reasoning is, therefore, that the physician not only has access to clinical facts, but also that he is able construct a plausible account of events and establish causal relations regarding the patient's

database ‘www.icddata.dk’ contains subsets of information from the device follow-up that can be accessed by physicians at the local hospital. However, this information is highly specialized, and will often require extensive background knowledge correctly interpret. Finally, the medicine database ‘EPM’ is intended to constitute centralized, single list of medicine prescribed to the patient. The system is however relatively time consuming to use, which is why it is not updated regularly. Therefore, the information contained in EPM is likely to be incomplete.

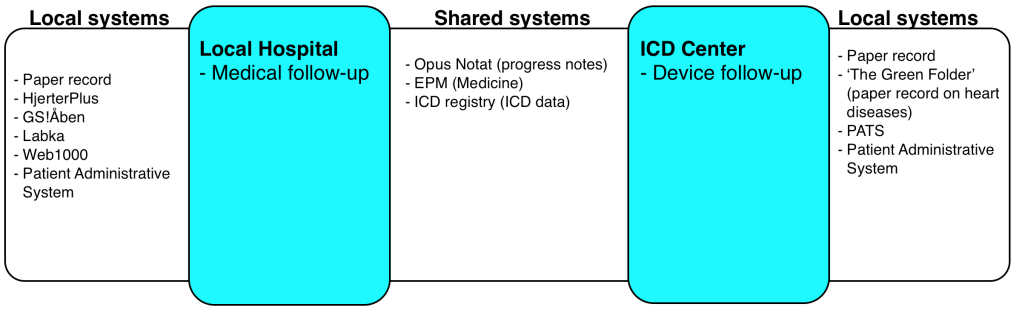

Figure 1. Fragmentation of the medical record

The current medical record in distributed ICD care is relatively fragmented, with patient information distributed across a number of poorly integrated systems. Therefore, the medical record provides healthcare providers with data that is potentially incomplete. It also functions poorly in supporting coordination across organizational boundaries. This is a generally recognized as a risk in healthcare, since lack of coordination can lead to organizational fragmentation and lack of continuity of care (Cebul et al, 2008). While the ad hoc narrative can to some extent be viewed as a symptom of the limitations of the medical record, it should also be considered to be a necessary and even desirable component of medical reasoning. The collaborative unfolding of the ad hoc narrative often adds information such as updated medicine lists. However, our study suggests that the process of unfolding the ad hoc narrative does more than just provide the physician with missing information. It also often provides a more appropriate plot of the patient’s condition. This *emplotment* process is only partially supported by the medical record. The record provides the physician with information about the patient’s illness trajectory and may provide cues to what is uncertain or untold. However, the complexity and fragmentation of the record makes it difficult to gain full insight into the patient’s condition within the relatively limited time span of a medical follow-up without the collaborative unfolding of the ad hoc narrative.

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