



## ICT and Integrated Care

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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 organise 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. The paper explores how a semi-standardised discharge letter is employed to communicate about the patient between two organisational settings, the hospital and the general practitioner. It is shown that the discharge letter plays a double role as informational tool and accounting device. And it is argued that further standardisation of the discharge letter content – in order to facilitate electronic exchange – is likely to strengthen the letter’s role as a tool for organisational accountability and weaken it as a clinical tool. The paper concludes 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.

**Key words:** 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, p. 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 cooperation 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*.<sup>1</sup> Key questions are: How can healthcare work 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 information are often seen as solutions to deficient communication within healthcare (Branger et al., 1995; De Maesener and Beolchi, 1995; Hampson et al., 1996). The vision is that by standardising and electronically distributing relevant work documents, healthcare providers 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 criticised for not doing a proper job.<sup>2</sup> The medical literature points to serious problems of quality (lack of relevant information) and timeliness (too late arrival to the GP's clinic). The letter is basically seen as failing its aim to facilitate communication on patients between the primary and secondary healthcare sectors (Olesgaard and Pedersen, 1987; Madsen et al., 1989; Jørgensen and Kjærgaard, 1990a, b; Jørgensen et al., 1990; Nielsen et al., 1990; 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 when seeing the GP (Nielsen et al., 1994). Also, researchers have experimented with highly structured discharge letters. By laying down the appropriate categories,

reducing free text notes, and using more diagnostic codes the letters' content is standardised for the purpose of smooth and timely exchange (Adams et al., 1993; Branger, 1994; Dahl et al., 1996; Dougherty, 1999; Van Walraven et al., 1999).

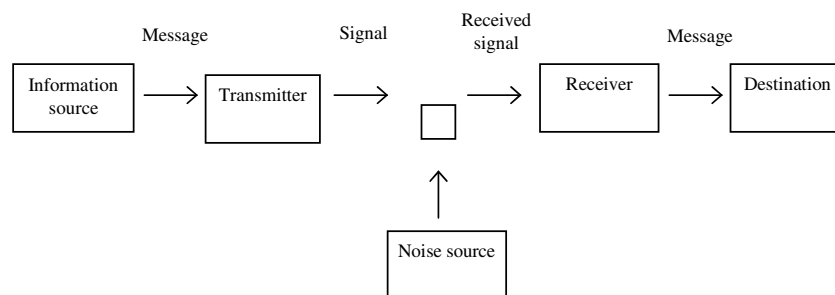
All of the above solutions share the assumptions that distinct and concise information forms the basis for good inter-organisational communication, and that new methods must be taken into account to speed up the selection, condensation and transmission of information. The focus lies on both standardising: (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 (Lippert and Kverneland, 2003; Sundhedsministeriet/Danish Ministry of Health, 2003).

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. It is argued that 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 supports 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 Shannon and 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., p. 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 (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 Hayles (1999) and 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 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 also 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 other entities (a message inscribed in a letter is not identical with the same message being given over the phone). Attempts to stabilise 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 stabilisation; nevertheless a message or a 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 instances in its trajectory (cf. Latour's circulating reference).

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 6 weeks of observations of daily work in GP clinics. To obtain additional insights into the role of the discharge letter four in-depth 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 (Aanestad, 2002; Clarke et al., 2003; Ellingsen and Monteiro, 2003; Hartswood et al., 2003 Monteiro, 2003; Berg, 2004). 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–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.<sup>3</sup> This is, as Weick puts it, a process of active sense making (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, p. 188)). It must also make an *argument* for these events to specific professional colleagues (see Ellingsen and Monteiro, 2003). And, in some cases 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 summarised 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.<sup>4</sup>

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 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 realised by the interplay of several elements.

#### **4. The GP clinic: Revitalizing the discharge letter**

Consider this translation of discharge information in a specific GP clinic: The moment a discharge letter enters the GP's practice its content is subject to evaluations on relevance. When a paper 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<sup>5</sup> 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.

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 for the GPs) 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 oral 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, as the revised letter enables the GP to offer a second opinion to a patient and thus provide information that is different from the information provided by the hospital staff.

#### 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 headlines (in the ICD classification DZ033, for example stands for "observation because of suspicion for disease in neural system"<sup>6</sup>). Such headings already exist when the electronic letter arrives, but often GPs find that they are of little or no relevance. 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 standardizing clinical registration<sup>7</sup> – does not in itself ensure relevance: the ‘formal’ code instead is transformed in the process of editing the discharge letter. This is in tune with Ellingsen and 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, p. 221).

A paper by Löwy on the collaboration between two professional groups in immunology and epidemiology substantiates this point. Löwy argues that ‘loose’ or ‘imprecise’ concepts, instead of working as ‘noise’ in the communication process, link professional domains:

“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, p. 373).

According to Löwy alliances are formed as different groups use the same concepts in different ways. Loose concepts simultaneously hold flexibility and stability and thus support collaboration and communication.

Above we have seen how discharge information does not simply ‘flow’ into the GP clinic through highly structured information in the electronic discharge letter. Establishing electronic communication and standardising discharge letters may support faster communication between organizations and professional domains, but the information still needs to be rendered useful by the recipient. Structure, thus, does not ensure precision and relevance; on the contrary the GP must edit the structured information to make it useful in relation to future, uncertain tasks. One of the reasons for doing this extra work is to be able to protect the GP’s field of expertise, as the GP uses the edited notes as her own notes during encounters with patients.

## 5. Discussion

“It is by no means ‘given’ what constitutes relevant knowledge” (Ellingsen and Monteiro, 2003, p. 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 often also 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 organisations that is more complex than what we find in the literature about discharge procedures and in the classic communication model by Shannon and Weaver.

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 recipient. It is, therefore, not given in advance what will count as relevant information and as successful communication.

Second, we have pointed to the ongoing translation processes through which the semi-standardised discharge letter connects healthcare providers. The combination of highly structured (e.g. coded information) 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 communicating 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 the discharge situation 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 argue that the degree to which communication is standardised will affect this balancing act and, hence, the interorganisational coordination. On the one hand, too little structure (much free text and few diagnostic codes) hampers coordination, because it takes time to read and write free text messages. On the other hand, overly standardised messages, i.e. a letter that predominantly contains information in a coded form, may make it hard to fulfil both concerns and may suggest that health care practitioners give priority to making a liable rather than a clinically useful account. Let us explain how this happens.

### 5.1. STANDARDISATION PROVIDE A POLISHED ACCOUNT OF CLINICAL EVENTS

In the discourse on integrated care, standardisation of clinical messages is asserted to improve its clinical relevance. We will, however, argue that the overall effect might very well be a *less* clinically relevant message, because of the duality of the hospital's communication and 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 omissions have been made during the patient's hospitalisation, or if no

clear diagnostic assessment can be made). 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 highly structured information of categories such as: referral diagnosis, test results, diagnosis, medication, and treatment plan) it may be hard for the hospital to produce a letter which allows for this interpretative flexibility. 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 (Garfinkel, 1967). The letter would then appear as a *complete* document in a bureaucratic and legally sense, holding a seemingly objective and unambiguous account of the hospital stay – a ‘god-trick’ is being performed, as Haraway (1991) puts it. In a *clinical* sense, however, the letter would be a *poorer* document, as it provides a polished and crude 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). Yet, 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). This is clearly the case in healthcare where, for example, attempts to “rationalise” the medical record by making small changes to the ways in which diagnostic information is documented and presented to the GP have been consequential to the way doctors use the medical record in clinical practice (Heath and Luff, 1996).

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 practitioners constantly work to distinguish areas of responsibility, the analysis 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 is 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 coordination ‘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.<sup>8</sup> 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 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

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 demarcating one's area of responsibility, but ill suited for communicating around a patient's case in order to integrate care.

The flexibility of semi-standardised 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 further standardisation may 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 is a call for being specific and for more research into the 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 thus 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. This does not mean, however, that we should search for "the true practice" to be supported, as has been a classic ambition in much CSCW-research. Practice is never singular, but ambiguous and varied. Also, as Berg argues in the introductory quote formal and informal practices always merge and interlock. There are thus fuzzy and fragmented versions of practice as well as coherent and meaningful ones.

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 is first and foremost an empirical one. What kind of cooperation do standards afford in specific situations? What kind of organisational accountability is prompted? What work is necessary for clinical messages to act as flexible communication tools?

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## Notes

- <sup>1</sup> 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* (McGhee and Hedley, 1995; Pritchard and Hughes, 1995; Hampson et al., 1996; Lee, 1998; Rubak et al., 2002). Pritchard and 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 and Hughes, 1995: 8).
- <sup>2</sup> Other contested documents are medication schemes and physicians’ continuation notes, which are accused of being messy and not offering any overview.
- <sup>3</sup> With Scholes and 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 and Kellogg, 1968, p. 4).
- <sup>4</sup> 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.
- <sup>5</sup> EDIFACT (Electronic Data Interchange For Administration, Commerce and Transport) is a global standard format for exchange of electronic data.
- <sup>6</sup> ICD stands for: International Classification of Diseases.
- <sup>7</sup> See B. Winthereik (2003) for an analysis of the use of diagnostic codes in three GP clinics.
- <sup>8</sup> This also counts for other users such as insurance companies or clinical researchers, who use information from an EPR for purposes that are secondary to the context of its production.

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