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When Information Sharing is not Enough

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Abstract. This paper explores information sharing in multidisciplinary clinical collaboration between three hospitals. Our study draws on qualitative interviews with surgeons and radiologists in two county hospitals and one university hospital. The analysis shows that the actors shared a restricted amount of information about the patients they have in common and that different actors used the shared information in different ways. However, much communication was still needed to clarify and negotiate the meaning of shared data and its implications for collaborative care. To conclude, while the arguments for a shared information space may appear convincing, the communication practice observed should illustrate that IS also needs to support the communicative process in clinical collaborative work.

Keywords. Shared record, communication support, transinstitutional collaboration, aortic aneurysm, surgery, radiology

1. Introduction

The process of planning and subsequent execution of clinical activities, including the coordination of information and transfer of patients, works reasonably well in small clinical units. Actors that are involved in the care of a patient have access to the same clinical information in a shared record system. At the same time, the actors have excellent access to each other, facilitating discussions and negotiations on care issues by allowing less formalized exchange of information. In multidisciplinary contexts, this practice might cause different disciplines to use presumably the same information elements in multiple ways [1].

Most clinical domains are characterized by a steady introduction of new clinical methods and techniques, innovations that must be accompanied by education and more specialized training of the personnel [2-4]. Clinical units that deploy new and improved services by taking sophisticated techniques into use, rapidly find themselves attracting patients from other hospitals. The less innovative clinical units might find a new role as a collaborating and contributing partner. In such situations, collaboration will have to be extended across institutional borders.

Clinical domains characterized by trans-hospital collaboration face particular challenges with regards to achieving efficient clinical information exchange [5]. It has been assumed that establishing shared information spaces will lead to more effective collaboration [6], for example when healthcare actors have to exchange information within or across units to provide patient care. Even if the involved actors get access to

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information system (IS) that is shared between multiple institutions [7], this will not suffice. The actors might have other unmet clinical needs that must be satisfied to support effective clinical collaboration. In this paper we have addressed this question in the context of collaboration between members of a multidisciplinary care team that provides advanced endoscopic surgical services (endovascular aneurysm repair (EVAR)) to patients with abdominal aortic aneurysms (AAA) asking the following questions: What information is actually shared between the collaborating clinicians? How is the information used by the different actors, and how is this information shared?

2. Method

Healthcare setting: One university hospital and two county hospitals, all being part of a Norwegian regional healthcare service. The information infrastructure consisted of a radiological IS on a shared inter-hospital server, deployed at all public hospitals in the particular health region. Identical Electronic Patient Record (EPR) systems were applied as a stand-alone installation within each hospital.
Study design: Semi-structured interviews with 12 key clinicians. The interview guide was inspired by a prior observation study focusing on one episode of monitoring for AAA patients potentially eligible for surgery [4]. From the county hospitals we interviewed two vascular surgeons and four radiologists. At the university hospital, three interventional radiologists and three vascular surgeons were interviewed, all being members of the EVAR care team. Each interview lasted 45-60 minutes and was tape-recorded for subsequent transcription. The analysis was inspired by a 'grounded theory' approach [8] and followed an inductive strategy [9]. For the purpose of this paper, we present only excerpts of the empirical material to illustrate the particular issues in question. The study was approved by the Regional Committee for Medical Research Ethics and the Norwegian Social Science data Services.

3. Results

In our case of multidisciplinary trans-hospital collaboration we found three different characteristics of information sharing. First, the exchange of information necessitated supplementary discussions to clarify and negotiate essential care concerns. Second, for non-emergency patients, timing was important, but not critical, and the communication could take place in an asynchronous way. Finally, the amount of overlapping information elements indicated a rather modest common dataset. Further details are given below.

3.1. What Information to Share?

Making a decision on whether to offer EVAR to a patient required collaboration between experts from both surgery and radiology departments. The transfer of patient information from the county hospital to the university hospital involved two key datasets: One set holding a processed excerpt of focal clinical information extracted from the medical record, and a second set holding more specific information stored in

the radiological record. Interestingly, the EVAR surgeons focused primarily on the clinical data set, while the EVAR radiologists drew mainly on the second one. In general, a rather restricted amount of information was shared. To exemplify this point, Table 1 depicts an illustrative EVAR case, describing the different information elements as well as the overall communication pattern.

3.2. How is the Information Used by the Different Clinicians?

As illustrated in Table 1/Figure 1, different actors had different perspectives on the shared information. The county surgeon considered the submitted dataset as a means to mediate important clinical risk factors, highlighted with key radiological information. The EVAR surgeons, on the other hand, viewed the same dataset within the context of deciding whether EVAR surgery was an option. Hence, one task included a request to the EVAR radiologists about working out an anatomical EVAR suitability assessment. This should be based on the delivered CT information combined with notes indicating clinical risk factors. A second task implied to consider the received clinical risk information and, if needed, collect supplementary considerations on preoperative risk factors. Further, the county radiologists viewed the radiological part of these datasets (e.g the CT images and report) as a means to support the local surgeon's decision-making by providing CT-derived diagnostic information of the AAA and its surrounding arteries. Some of them even included EVAR specific measurements of the arteries, intending to contribute to the EVAR radiologists' assessments. However, to the EVAR radiologists, this CT information did not suffice. They had to acquire additional data by getting hold of the CT source dataset collected at the county hospital. In general, the EVAR radiologists viewed this source dataset to be fundamental for their image processing, grounding the radiological decision on anatomical EVAR suitability, as well as guiding both their choice of stentgraft components and the actual EVAR intervention.

Table 1. Principle communication pattern for eligible EVAR candidates – an illustrative case.

County hospital: 71-year-old-patient attending the regular surveillance of his AAA. Having balanced the risks and benefits of surgical repair versus ongoing surveillance, the surgeon recommends EVAR surgery. A radiological CT scan supports the surgeon's decision-making. In agreement with the patient, the surgeon sends an EVAR referral letter to the vascular surgery team at the university hospital, including important hand-over information: e.g. considerations on the patient's comorbidities and preoperative risks. In addition, the surgeon gives access to sharing of CT data between the two hospitals.
University hospital: The vascular surgeons (=EVAR surgeons) request the EVAR radiologists to consider the patient's CT-scan with respect to anatomical EVAR suitability, including some notes about the patient's risk factors. If needed, the surgeons also collect supplementary clinical considerations, arranging for a separate patient-surgeon consultation and/or tests. As for the radiological work, the EVAR actors draw on the patient CT data or, more precisely, the CT source data collected at the county hospital. The existing IS does not offer a source data transfer utility, but an informal arrangement has been set up between the EVAR radiologists and the county ones to support this function. In a face-to-face meeting between the EVAR experts, the two disciplines share their information.Then follows a discussion including clarification of various risk factors accompanied by negotiations on the difficult trade-offs between anatomical and clinical risk factors. In case of EVAR, the radiologists will be responsible for the ordering of customized components/stentgraft.

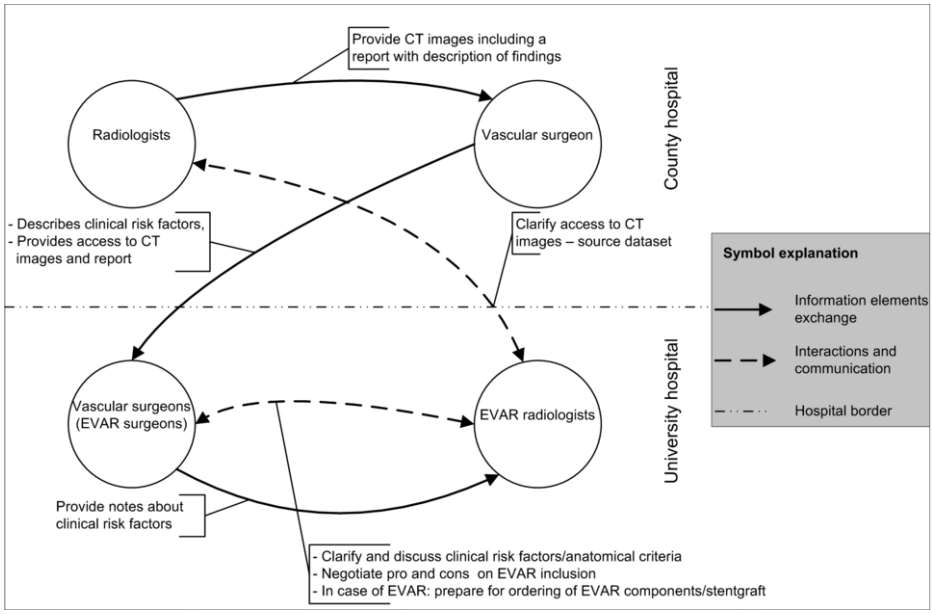

Figure 1. Principle interaction pattern for EVAR collaboration across hospitals.

3.3. How is the Information Shared?

Throughout the course of the EVAR suitability assessment, collaboration unfolded as partly asynchronous, discipline-specific work tasks, interspersed with multiple communicative acts**.** The existing IS solution supported parts of the communication. The actors also communicated by phone, by sending formal paper letters and by exchanging handwritten notes. Information about the outcome of the multidisciplinary face-to-face meeting to decide upon the crucial EVAR inclusion at the university hospital was particularly important. In this meeting the different actors presented, discussed, and negotiated pro and cons of further actions, in particular to balance clinical risk factors against anatomical conditions. Further, some of the county radiologists reflected on the lack of feedback from their colleagues at the university. They pointed out that feedback on their delivered CT work could have helped them improve their EVAR diagnostic-related CT skills. These actors illustrated how the communication could have taken place by presenting examples on how they collaborated with colleagues at other hospitals in other clinical settings.

4. Discussion

In this case report, we have shown that having access to a shared information space does not suffice to establish an effective collaboration between clinicians that collaborate across institutional borders. As our data indicate, communicative processes are also necessary, because substantial parts of the collaboration consisted of giving multiple meanings to information from different perspectives and to negotiate the implications for further actions. The information shared was rather modest, leading to discussions to clarify and negotiate the meaning of the shared data as well as their

consequences when approaching collaborative care concerns. From this, it might seem that seeking to enhance clinical collaboration by providing a shared information space does not suffice when dealing with a limited amount of overlapping information elements. This view is in line with that of Ash et al [10] who argued that the varying and changing bulk of information put strict demands on the specification of shared minimum data sets to avoid information systems causing new types of errors.

The use of both asynchronous and synchronous communication channels indicated that not all EVAR tasks were time-critical. Asynchronous communication was often enough. This emphasizes the need for support of asynchronous information exchange in the IS-solutions (e.g. email functionality, discussion forums and chat).

In conclusion, IS support should both support communication and negotiation within cross-organizational clinical activities as well as facilitate the sharing of data. This has implications for many initiatives that aim to improve the coordination of care services, such as the Norwegian National Health Plan [11]. Despite the limited number of cases, our study has shown that today's IT-systems make it difficult to support care that is provided as collaboration across institutional and professional borders. To accommodate for this, we propose to apply an information needs approach [12, 13] as the first step for process support in evolving clinical treatment processes.

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