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Acknowledging the Results of Blood Tests: A Study of Heterogeneity at Work

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Abstract. At the studied hospital, physicians from the Medical and Surgical Departments work some of their shifts in the Emergency Department (ED). Though icons showing the blood-test process were introduced on electronic whiteboards in the ED, these icons did not lead to increased attention to test acknowledgement. Rather, the physicians, transferred work practices from their own departments, which did not have electronic whiteboards, to the ED. This finding suggests a challenge to the cross-disciplinary work and norms for how to follow up on blood-test results in the ED.

Introduction

Studies show that failure to follow up on test results is a substantial problem which impacts on patient safety (Callen et al., 2011). In response to this challenge physicians at Danish hospitals are required to acknowledge explicitly for all blood-test results. The physicians at the three departments in this study (Medical, Surgical and Emergency Department) have long been able to view blood-test results electronically in the laboratory system and, since October 2011, the acknowledgement of having seen the results has also been given electronically in the laboratory system.

The latest initiative to increase the physicians' persistence in acknowledging test results is the introduction, in April 2012, of icons on the electronic whiteboard in the ED, indicating the four steps of the blood-test process (ordered, tak-

en, results available, and acknowledged). By adding the icons to the whiteboard they were incorporated in a central and well-liked ED artefact (Hertzum, 2011). Many of the physicians with duties in the ED are staff from other departments. That is, they work some shifts in the ED, but spend most of their shifts in their own department, where the work practices in many respects differ from those in the ED. Thus, the icons on the whiteboards in the ED aim to support the acknowledgement of test results in a setting where a group of physicians with heterogeneous work practices come together across organizational boundaries and use infrastructural systems (Johannessen and Ellingsen, 2012). We investigated the physicians' use of the icons by observations in the ED (11 hours) and by shadowing medical (17 hours) and surgical (4 hours) physicians in their own department and when they attended the ED. Our analysis addresses whether the introduction of the icons fits with the as-is infrastructure of existing systems and work practices present in the ED, *the installed base* (Hanseth and Lyytinen, 2004).

Results

In the *Medical Department* blood tests are important in performing a clinical evaluation of the patient's condition. In preparing for the ward rounds, the physicians read the patient's electronic record while at the same time evaluating the blood-test results in the laboratory system. We found that physicians in most cases were diligent in acknowledging blood-test results in immediate continuation of evaluating them. In this setting, performing the acknowledgement seemed like a fairly effortless activity. One senior physician pointed out the importance of acknowledging blood-test results during the ward rounds, when the physicians can evaluate them in the light of other pieces of information about the patient. If acknowledgment is performed at a later time, it is a time-consuming activity for the physician who first has to obtain information about the patient's condition and on this basis evaluate whether the test can be acknowledged without initiating further steps. In some cases, blood-test results are not available in time for the ward rounds. The Medical Department has therefore implemented a practice, where the senior physicians at the end of their shift check the laboratory system for all test results that have not yet been acknowledged. In one of these instances, we observed a physician going through a list of 15 patients in the laboratory system, several of them examined by other physicians during the ward round. Consequently, the physician was not familiar with all patients on the list. All results were acknowledged without taking any notes or performing any other action. He explained that since the patients were still admitted to the ward, he assumed that they would be taken care of. Though this activity could seem like a formal add-on, implemented by the department management to meet the political demand for acknowledging all blood-test results, the physicians stated that the activity made them confident about not missing important information. The end-of-shift check

appeared, however, primarily to serve as a screening for outliers, where the physician evaluated the test results by comparing them to previous tests for the same patient and evaluating whether acute steps had to be taken.

In the *Surgical Department*, blood tests are less important when deciding the right treatment for the patients. During the ward rounds we observed how physicians used other test results (primarily x-rays) as a main source of information. If x-ray results showed that the patient needed surgery, blood-test results were evaluated to decide whether the patient's condition allowed for the procedure. Whereas the physicians in the Medical Department stated that acknowledging for blood-test results made clinical sense, the physicians in the Surgical Department were more critical toward the electronic acknowledgement. We observed many cases, where the physicians in the Surgical Department did not acknowledge for the blood-test results in the process of evaluating them. One of the physicians stated that he saw acknowledgement as a purely administrative action, which in addition could not be trusted because the laboratory system allows for evaluating blood tests without acknowledging them as well as for acknowledging without evaluating. These findings suggest that the political demand of acknowledging all blood-test results is seen as a formal add-on with little clinical relevance for the physicians in the Surgical Department.

Our observations in the *ED* showed that the physicians from the Medical and Surgical Departments, working their shifts in the ED, transferred practices regarding the acknowledgement of blood-test results from their own department to the ED. The observed physicians made limited use of the whiteboard icons. When asked about the icons on the whiteboard, one of the physicians stated that she preferred using the laboratory system before seeing a patient, or while she was otherwise using a computer for viewing or dictating a patient record, rather than being informed by the whiteboard about other tests awaiting her attention. In this process of evaluating tests in the laboratory system, the physicians from the Medical Department would mostly acknowledge for new test results immediately after evaluating them. The physicians from the Surgical Department stated that since blood tests were less central to their work, they often did not find it important to acknowledge for them.

Discussion

The physicians from the Medical and Surgical departments have different attitudes and work practices regarding the acknowledgement of blood-test results. These differences are not an issue when the physicians are working in their respective departments, but when they are brought together in the ED the different infrastructures in terms of attitudes and work practices become apparent and pose a challenge to the cross-disciplinary work and norms for how to follow up on blood-test results. Thus, the organization of the ED, which relies on physicians

from other departments, creates a heterogeneous environment in which work practices from other departments must be amalgamated to reduce misunderstandings and ensure the quality of care.

Presently, the ED appears to rely on the whiteboard as the primary artefact for supporting the work with test acknowledgement, but as the physicians primarily transferred the practices of their own department and used the laboratory system to support their work with blood tests, they seemed to pay little attention to the icons. The icons did not seem to fit with the installed base or, more specifically, they have not been integrated into the existing work practices of the physicians and therefore do not increase the physicians' attention toward acknowledgement. Thus, the whiteboard is not a strong coordinative artefact for ensuring acknowledgement. To ensure consistent follow-up and acknowledgment of blood-test results, the ED needs a stronger coordinative protocol. In working to create a stronger protocol, the ED must recognize the need to have the physicians from the different departments negotiate and reach an agreement on the use (and further development) of the whiteboard icons for acknowledging blood-test results.

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