

# Workflow dilemmas in lab results follow-up

Hallvard LÆRUM<sup>a 1</sup>

<sup>a</sup>*ICT department, Oslo University Hospital, Oslo, NORWAY*

**Abstract.** As part of implementation of electronic communication of lab results, new functionality to sign off lab reports became part of the electronic medical records (EMR) system. This paper discusses experiences with electronic lab results, which are less frequently signed off than expected, and elaborates a few dilemmas that challenge traditional workflow models in this area.

**Keywords.** Medical Records Systems, Computerized; Laboratory Examinations and Diagnoses; User-Computer Interface; Workflow

## 1. Introduction

Lab test results, radiology reports, microbiology results and other results are vital to delivery of modern health care. As clinical decisions typically rely on such results, a comprehensive follow-up of the results is crucial to patient safety [1, 2] The paper-based follow-up workflow has been replaced with electronic communication of lab results, as new functionality to sign off lab reports has become part of electronic medical records (EMR) systems. This paper discusses experiences with monitoring electronic lab results through sign-off and outlines a few dilemmas that challenge traditional workflow models in this area [3].

## 2. Methods

We collected signoff statistics from systems logs of the EMR once a month over an extensive period (2006-2011). To elaborate on the identified dilemmas, material from workflow analyses, suggested procedures by the ICT department at University Hospital, workflow descriptions collected in informal user interviews, and user feedback in dedicated workshops will be used to elaborate our experiences.

## 3. Results

Reporting of lab results is a fairly distributed work process where individuals are involved in different phases of ordering, performing, reporting and follow-up. To ensure that results are looked at the clinician must *sign off* results after viewing them.

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<sup>1</sup> Corresponding author.

The system logs showed that a significant proportion of lab results were not signed off. The sign off proportion varied highly across departments, by investigation types and over time. Interview and workshop material indicated that the functionality did not fit the local workflow in all organizational units, revealing unexpected, complex user needs or “dilemmas”. The dilemmas included cooperative ordering, results interpreted as packages, screening for extreme values, separation of clinical pathways, and investigations performed by or already known by the user. These dilemmas relate to the distributed work process, and will be elaborated in the presentation.

#### **4. Discussion**

Our findings suggest that implementing electronic sign off for lab results may lead to unexpected consequences that persists even after several development cycles. The considerable number of reports not immediately signed suggests a low user acceptance of the sign off functionality, and points to weaknesses in the EMR system’s support of the local and individual follow-up routines.

Several factors may affect the user’s perception of the sign-off task. Non-standard mechanisms are sometimes used to identify the addressee of the report. If a report lacks a convincing reason for showing up in the user’s task list, the user might not regard it as a valid task. Also, the recipient’s perception of who’s responsible for the report may not fit criteria in the distribution mechanism, for example when a patient follows complementary, parallel clinical pathways, or two physicians order an investigation collaboratively. Even if the user is the correct recipient, the report itself may not be seen as relevant. In some cases, the content of the report is already known (e.g. radiology images interpreted by surgeons), and in others co-dependent results are not yet finished. Sometimes the result is not signed off, because the user leaves the report to seek complementary information in the medical record, or wants to implement actions prompted by the result before signing it off.

#### **5. Conclusion**

Lab reports are signed off less frequently than expected in our hospital. User input and workflow analyses pointed to a set of dilemmas produced by the present functionality. Although use of an EMR system’s functionality in local practice may not be transferable, the dilemmas might be regarded as hypotheses of work flow generalizations and ideas for workflow development related to EMR systems.

#### **References**

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