Documentation of vital signs in electronic health records: issues for patient safety.

Jean Stevenson-Agren¹,², Goran Petersson¹, Gunilla Nielsen¹, Peter A. Bath²

¹eHealth Institute, Linnaeus University, Kalmar, Sweden
²Information School, University of Sheffield, Sheffield, UK

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1. Introduction

Inadequate design and poor user-interface are given as reasons for unsuccessful implementation of electronic health records (EHR) [1,2]. However, rather than designing more suitable technology, the trend has been to 'muddle through' [2] and to urge health care workers to adapt to poorly designed systems [3]. This may work to some degree but little is known about the impact this could have on patient safety. The design of vital sign charts has an impact on the ability of clinicians to detect deterioration in patients' clinical status [4-6]. Changes in a patient's vital signs may indicate a life-threatening event [7,8] so charts should be user-friendly to support clinicians in decision-making [9,10]. The aim of this study was to examine the documentation of physiological vital signs in an EHR. In this paper, we present the results regarding accessing information on a patient's physiological vital signs.

2. Methods

We examined the electronic health records for vital signs of 228 patients who had suffered an in-hospital cardiac arrest at the study hospital and on whom resuscitation had been attempted, from 2007-2011. This was a population-based study in a district general hospital of 372 beds in South-East Sweden. Patients were identified using the Swedish Register for In-hospital Cardiac arrest [11]. We collected data on all vital signs and their locations within the EHR. Additionally, we collected detailed data on each step taken to retrieve each vital sign from the EHR: this was to provide knowledge about the steps required of end-users to access and assess patient's vital signs. The vital signs were temperature, pulse, respiratory rate, blood pressure, conscious level, oxygen saturation and if the patient was receiving supplemental oxygen therapy.

3. Results

The recording of information on the seven vital signs was highly variable across three different sections of the EHR: the template, the journal and the report sheet. Overall, the respiratory rate was recorded in less than 30% of cases and blood pressure was the most frequently recorded, in 78% of cases. Related to this, there were difficulties in finding and viewing this information. Each of the three sections in the EHR had to be scrutinised closely to find the information: this required many clicks and multiple screen changes, e.g., to check the template section for one blood pressure value, four clicks of the mouse were required and thus, 28 clicks to view seven vital signs. An overview of the vital signs
was not possible, no graphical presentation was available and previous signs could not be viewed in sequence.

4. Conclusions

The highly variable level of vital sign data being recorded, which for some vital signs was very low, meant that this information would not have been available for clinical staff [12]. Possible reasons for the low levels of recording might include poor routines for measuring vital signs, or the number of clicks required to reach the section in which it could be viewed. Additionally, the lack of graphical presentation may reduce the efficiency of monitoring and interpretation of vital signs [4,13]. Identification of clinical deterioration may therefore have been impeded, indicating that this EHR could have a negative impact on patient safety. Further research is indicated to ensure that workflow, human-computer interaction and usability are considered when designing software and, importantly, to include end-users in its development [1,12].

References