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Exploring Clinical Overview

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Abstract. Clinical overview is explored at four emergency departments (EDs) during the introduction of a new IT system to support hereof. Important aspects of clinical overview are described for the clinical practice and for the further development of the IT system.

Introduction

This study has explored the process of establishing clinical overview, which is a mean to manage the flow of patients at EDs. The focus of the study was to ascertain important elements for the clinical practice and for the further development and design of an electronic whiteboard (EW) system. The study was undertaken during the implementation of the EW system and found that intangible elements of the clinical practice were not sufficiently support by the system.

The empirical work was situated in a collaborative and semi-distributed setting of four different EDs located in Region Zealand, Denmark. It comprised 39 work place observations at the wards. During the observations practitioners were asked about their practice if clarification or further understanding was needed. 23 semi-structured interviews were held subsequent to the implementation of the EW system. The interview guide was made on the basis of the observations.

The outset of the project was to support clinical overview by providing the right information to the right people at the right time enabling them to manage flow at the wards. Flow in this context is the patients' stay at the ward following a certain trajectory from when the patients are announced, received, diagnosed, initially treated, and then discharged. The temporal aspect of this trajectory is guided by a triage system, which determines the severity of the patients.

The Concept of Clinical Overview and Awareness

Initially, clinical overview was articulated and defined by the practitioners as their mental and visual overview of data generated, collected, and passed on in relation to the status of the patients and the tasks at the ward but also information related to fellow practitioners. In Danish, 'overview' is "*to survey or assess a situation or a subject and view it in a wider context*" (Politikens Nudanske Ordbog, 2005), which implies the ability to fathom 'it all' at once, meaning that overview is something that one establishes. Adding to this definition of overview the term 'awareness' seemed relevant and much alike. Endsley (1995) presents a three-leveled model for establishing situational awareness (SA) in dynamic systems as "*[…] the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the near future*" (Endsley, 1995:37). Granting that acquiring overview is an individual process Endsley's (1995) definition however, does not align with this study of clinical overview at a ward level. At the ward level the individual clinician's overview is not the concern but the combined overview of all the clinicians, which enable them to collectively manage the flow. Using the SA model becomes limited as the definition of 'team SA' is "*[…] the degree to which every team member possesses the SA required to his or her responsibilities*" (Endsley, 1995:39), which does not reflect what was observed, namely that overview is not necessarily about own responsibilities or own overview but can as well be about ensuring the overview for others.

   In this paper a distinction between 'awareness' and 'overview' has been made based on the observations that focused on the clinical practice at a ward level. Clinical overview is viewed as a process due to the initial outset from the practitioners' definition as well as how it has been observed in practice and as a term 'clinical' is the setting and profession whereas, 'overview' is the phenomenon studied. 'Awareness' on the other hand is used to establish clinical overview and describes two types of information to be aware of and react to; a) as a term for tangible information about mainly patients and work tasks, and b) as a term for the intangible information which is the practitioners' sense of 'what is going on' at the ward. This way of defining 'awareness' as two main information types counter what Schmidt (2002) propose as he states that we cannot talk about 'awareness' as mere passive information gathering or as a dichotomy like tangible and intangible information. According to Schmidt (2002) "*'awareness' is an integrated aspect of practice and must be investigated as such.*", which is in accordance to how 'awareness' was investigated in this study. However, due to the analysis and exploration of the important elements of clinical overview it was useful to distinguish 'awareness' into such dichotomies as tangible and intangible in order to better be able to find important elements for practice and further development of the EW system. Furthermore, Kuziemsky and Varpio (2011) have developed an awareness model for interprofessional collaborative care (ICC) delivery in an

asynchronous setting. The model consists of four main awareness types: Environment, Decision making, Patient, and Team members, which are used as a common ground for the practice of collaborate teams. Their model accommodates most of the tangible information found in this study however, the intangible information and the highly collaborative setting of local mobility work at the EDs did not seem to fully fit into the ICC awareness type model.

Exploring Clinical Overview

The exploration of establishing clinical overview was done by the analysis of the empirical data. First, the observations of practice before the introduction of the EW were coded and categorized. Second, the interviews done subsequent to the implementation were analyzed. Third, an evaluation was conducted of which types of awareness the implemented EW system was able to support and not support. The evaluation was done by analyzing the observations conducted after the EW implementation and by analyzing the interviews focusing on what was said about the support of the EW system. Important elements found from the two first analyses were the trajectory of the patients, their clinical data, their location and announcement. The evaluation found that the EWs supported the clinical practice by letting "*[everyone, red.] see which patients are here and which are on their way. You couldn't that before*." (Mgmt. phys., 2011). The allocation of patients and staff at work were also shown and "*that's the huge advantage, you know whom to ask*." (ibid.). These elements are tangible awareness types and all supported by the EW system.

Even though, the information described above enabled the practitioners to assess their workload, 'clinical overview' still seemed to entail other elements. Observing a nurse on a chaotic day when he went out of the patient room to get a sense of 'what was going on' he checked the level of chaos at the ward. He described this chaos situation as where nobody really knows where the patients are, and where they are going, who are taking care of what, and then the noticing of the buzzing in the hallways. Though, in part he was just looking for a physician and offering his work to the CN (as he mentioned he could easily care for twice the patients at a time than he presently did). These elements are intangible types of awareness and they are also used to manage the collective care delivery at the ward. Observing what the practitioners did in order to gain awareness of the intangible information; was glancing down the hallways of the ward and getting a notion of whether people were taking it easily or if they were in a hurry. It was knowledge about your colleagues' care capacity of the day. Hence, the awareness of resources available, location of fellow colleagues, and the sensing of 'what is going on' at the ward were found to be important in the establishment of clinical overview though, they were only to a limited degree supported by the EW system. Important awareness types also include the direct information about fellow colleagues' whereabouts, which were not supported as only their current assigned

patients and the anticipated next step in the trajectory could be derived from the EW system. For example a nurse was observed pacing back and forth in the hallways looking for the CN and whishing she had a GPS on the CN so she could track the CN with her smartphone.

Developing (for) Clinical Overview

This study has shown that in a collaborative setting there is more to the establishment of clinical overview than only ensuring your own. Aiding in the provision of overview for a colleague by e.g. making oneself available for the CN was part of establishing clinical overview at the wards and that goes beyond the cognitive understanding of overview. Understanding the different types of awareness in a specific work practice is important for the design of support systems (Kuziemsky and Varpio, 2011). It is important to know whether we design for tangible information supporting information retrieval and display or if we design for intangible information supporting information dissemination. Further, investigating the concept of clinical overview in additional settings would contribution to research by enhancing the Kuziemsky and Varpio (2011) awareness model.

One of the challenging parts in designing IT systems for support of a clinical practice is to investigate the intangible awareness types and establish how and where and for whom in the work practice they need to be retrieved and displayed or disseminated. That is why it is important that we go into more detail about the different awareness types of information not because they become mere collective information that can be displayed or not but because they are still integrated elements of practice, which only occur due to the specific practice. The goal here is not to diminish Schmidt's (2002) recommendations about posing the more holistic questions for investigating awareness in practice. Rather, it is to state the necessity for an atomistic analytical approach when designing support systems for clinical practices.

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