Combining Work Process Models to Identify Training Needs in the Prehospital Care Process

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Abstract. The prehospital process is complex and covers a wide range of locations, healthcare personnel, technologies and competences. Enabling high quality holistic training is hence a challenge. Process models are efficient tools for representing reality, but no single modeling approach can cover the complexity of prehospital care. In our research, we have investigated the possibility to combine various process modeling techniques in order to identify training components and as many perspectives of the prehospital process as possible. Results show that combining different approaches and adapting them based on the need at hand is a successful strategy for enabling an of the prehospital care process from multiple perspectives, including identification of holistic, realistic and engaging training components. Future work can utilize our results to build training scenarios that can be implemented in training using for example simulation.

Keywords: prehospital care process, process modeling, training components.

1 Introduction

Prehospital emergency care is an important link in the overall care chain, and one of the keys to providing reliable, efficient and good healthcare to citizens. This requires competent and efficient emergency medical personnel with relevant education and a broad range of skills that are up-to-date. There are, however, many challenges to effective and realistic training in this domain. Because of the complexity of the prehospital care process, current training approaches are not sufficient. In order to create holistic, realistic and engaging training, thorough knowledge and analysis of the prehospital care process is crucial. Very few studies have so far modeled the prehospital care process, with Jensen (2011) being an exception. In this paper we propose the use of different work process models for modeling this process, to enable the prehospital care process to be viewed from several perspectives.
1.1 The Prehospital Care Process

The term “prehospital care” covers a wide range of medical conditions, medical interventions, clinical providers and physical locations (IBTPHEM, 2012). Medical conditions range from minor illness and injury to life threatening emergencies. Prehospital interventions therefore also range from simple first aid to advanced emergency care and prehospital emergency anaesthesia (IBTPHEM, 2012).

The prehospital care process is complex, diverse and often fragmented in different ways, e.g. because it involves: moving and transporting patients between different locations, consists of (often) time-critical work; and, requires collaboration between actors from different professions and organizations. As discussed by Söderholm (2013), the overall chain is plagued by both redundancies, gaps and loss of information, as well as insufficient ICTs (e.g. Reddy, et al., 2008). Furthermore, Vessgren and Wahlberg (2010) have identified a number of specific challenges that prehospital personnel encounter on-scene:

- environmental factors, such as traffic, weather, time of day, sound levels, number of people present, handling patients on-scene, and security risks;
- lack of information, such as being insufficient or difficult to interpret information about for example number of injured, number of vehicles, and types of injuries;
- poor on-scene communication and prioritization of patients, due to problems with or infrequent use of prehospital care management on scene;
- communication difficulties: Remote communication can be problematic, such as when technical equipment does not work, or communication differences between different professions, but also on-scene between colleagues and with patients, as well as risk of missing information.

Hence, the prehospital work process is impacted by concrete factors (such as environmental), but many problems concern a lack of coordination, information, documentation, and general approaches. Failing to meet these challenges might have consequences further on in the care process. For example, lack of, or insufficient documentation by EMS personnel in the field has been associated with poor patient outcomes (Laudermilch et al, 2010). Also, seemingly brief and lightweight communication/information exchanges, such as when paramedics are dispatched to a call by SOS Alarm, or, when they call a nurse in the emergency room to pre-alert about arrival and basic patient categorization and status, are important for understanding what has happened in the field or during transport and indicate or even determine what will happen next. From a training perspective, it is crucial to look at the prehospital process as a whole, and thus including aspects not directly related to patient care procedures, such as transportation between different locations, communication and collaboration.

1.2 Training Needs in a Prehospital Context

Competence can be simply defined as the ability to operate to an adequate, safe standard (Clements & Mackenzie, 2014). Competence-based training and assessment