Editorial

Special issue on Supporting Collaboration in Healthcare Settings: The Role of Informatics

1. Introduction

Healthcare is among the most complex and highly collaborative domains of work in the world. Medical informatics researchers have been studying the role of collaboration and how to best support these collaborative activities for a number of years [1,2]. Furthermore, researchers in disciplines outside of medical informatics such as Computer-Supported Cooperative Work have long been interested in healthcare [3] including examination of electronic medical records in collaborative clinical settings [4], collaborative technologies in healthcare [5], and the collaborative practices of patient care teams [6]. Through these and other studies, we have gained a better understanding of the role that collaboration plays in healthcare and the types of technologies that can support collaboration among health care workers.

Although many prior studies and technologies have focused on clinical and hospital settings, the changing nature of healthcare delivery also opens a larger space for collaboration research. For instance, the concept of individuals managing their own health information independently through a Personal Health Record (PHR) raises new questions about collaboration mediated over differing levels of expertise and terminology, as well as across organizational boundaries and professional disciplines.

Hence, we are now at an opportune time to further examine how research on collaboration can inform the design of current technologies that support collaboration in health care. Consequently, in this special issue on “Supporting Collaboration in Healthcare Settings: The Role of Informatics”, we have a number of papers that examine issues of collaboration and workflow in different clinical settings, how well health information technologies support collaboration, and ways of modeling collaboration in and across healthcare organizations.

2. Collaboration and workflow

Most clinical environments are information-rich, complex, and highly collaborative care environments. Consequently, there is a growing interest in the medical informatics community to understand the issues surrounding workflow and collaboration in these environments [7]. In this special issue, a number of authors have examined issues surrounding collaboration, workflow, and technology through empirical studies in a variety of settings.

Critical care settings are of particular interest to researchers because of the high degree of collaboration required to maintain the workflow in those units. For instance, Baggs and associates [8,9] found that poor collaboration between physicians and nurses in an ICU setting resulted in poor patient outcomes. Similarly, Melby et al. (Coping with the Unforeseen in Surgical Work) investigates how pre-operative staff members collaborate to manage unexpected events that arise in the workflow to prevent poor patient outcomes. They discuss the role that information systems play in supporting or hindering this type of collaboration. Besides intensive care units and surgical departments, another setting of interest to researchers has been emergency departments and trauma centers. Sarcevic et al. (Leadership Structures in Emergency Care Settings: A Study of Two Trauma Centers) examine the effects of cross-disciplinary leadership on trauma teamwork. They identified five different types of leadership structures in the trauma teams and described their impact on the teamwork. Within these units and also in other non-critical care units, security and privacy are essential element of workflow. In their study of network security in a hospital, Heckle and Lutters (Tensions of Network Security and Collaborative Work Practice: Understanding a Single Sign-on Deployment in a Regional Hospital) discuss the difficulty that healthcare providers and IT staff have in balancing appropriate access with the need for strict security.

Regardless of the particular setting, an important aspect of collaboration is communication. Without the appropriate
communication support in place, collaboration can suffer. Weir et al. (An Exploration of the Impact of Computerized Patient Documentation on Clinical Collaboration) used focus groups of nurses, physicians, and administrative staff from four Veteran’s Administration sites to investigate the importance of clinical documentation as a mechanism for communication to support coordination and collaboration. They found that the computerized documentation has changed how “narratives” are now documented. This has both potential benefits and costs.

3. Collaboration and health information technologies

Even though many health care systems are developed with a focus on the individual user, these same systems are often utilized to support collaboration [10,11]. For instance, the electronic medical record (EMR) is viewed by most people as a repository for patient information accessed by individual health care providers. While it does serve as a patient information repository, the EMR also helps support collaboration among patient care team members by providing them with information about what other team members have done for the patient [12]. Clinical systems such as an EMR or a computerized physician order entry (CPOE) mediate far more collaborative activities than originally anticipated by their designers. Consequently, The challenges of designing health care systems to appropriately support the collaborative activities of health care providers require designers to not only understand the technical requirements of the system but also the collaboration that these systems must support. One approach that designers can take is to involve the potential users of the systems in the design of the technology through techniques such as participatory design [13]. Hasvold and Scholl (Disrupted Rhythms and Mobile ICT in a Surgical Department) presents a study of mobile technologies in a surgical ward and discuss the utilization of the participatory design process to involve potential users to in the design of these prototype technologies.

Another major challenge that these technologies face is the view that they must effectively replace paper – a flexible documentation mechanism that has long been a part of healthcare [14]. Feuelf et al. (The Impact of Medical Record Technologies on Collaboration in Emergency Medicine) compare the effects of paper and electronic charts on the workflow in two emergency departments. They identified four requirements for designing more effective electronic medical records. Similarly, Morrison et al. (Multi-disciplinary collaboration during ward rounds: embodied aspects of electronic medical record usage) compare how well the paper medical record and electronic medical record support multi-disciplinary collaboration during hospital rounds. They found that the paper record supported nuanced non-verbal interaction better than the electronic medical record.

Although most studies of health IT focus on the EMR, CPOE, or other health information systems within healthcare organizations, there is growing interest in other technologies to support communication and collaboration across distances and organizational boundaries [15]. For instance, technologies to effectively support the medical care over a distance (i.e. telemedicine) is growing at a dramatic rate. Anderson et al. (Designing for Collaborative Interpretation in telemonitoring: Re-Introducing Patients as Diagnostic Agents) investigates the telemonitoring process for chronically ill patients with implantable cardioverter-defibrillators (ICD). The authors identified a variety of collaborative practices that were associated with the telemonitoring process. They then argue for a new socio-technical design that better incorporates the patient in the process. Telemedicine is one example of technologies designed to support clinical care over a distance. Another example of inter-organizational information sharing are health information networks. In their study of the Social Security Administration’s collaboration with MedVirginia, a state health organization, Feldman and Horan (Collaboration in Electronic Medical Evidence Development: A Case Study of the Social Security Administration’s MEGAHIT System) investigate through an interview-based case study, the organizational factors necessary for the successful utilization of the Nationwide Health Information Network (NHIN).

4. Models and metrics of collaboration

Models and approaches to capturing the different aspect of collaboration have long been of interest to researchers in various disciplines. The development of models to help explain and predict outcomes are also an important area of research for the medical informatics [16,17]. In this issue, Collins et al. (Model Development for EHR Interdisciplinary Information Exchange of ICU Common Goals) describe the importance of documentation in intensive care units and of supporting interdisciplinary information exchange through the documentation. They are interested in developing a model to help understand this information exchange. Focusing on broad health information system design, Kuziemsy and Varpio (Model of Awareness to Enhance Our Understanding of Interprofessional Collaborative Care Delivery and Health Information System Design to Support it) examine the role that awareness plays in interprofessional collaborative care (ICC) and how health systems can be better designed to support the awareness. At an organizational level, Hayes et al. (Organizational routines, innovation, and flexibility: the application of narrative networks to dynamic workflow) use the concept of narrative networks to model the workflow in an organization. They discuss how these networks can augment current representations of workflow in order to better capture the daily variability in the workflow. This in turn could help identify problem areas in the workflow.

Researchers have also focused a great deal of attention not only developing models to help describe and/or predict behavior but also on the metrics of how to identify success in a particular set of activities. Kroes et al. (Hospital readiness for health information exchange: development of metrics associated with successful collaboration for quality improvement) conducted an on-line survey of hospitals involved in a large data sharing collaborative to identify factors associated with “successful” participation in that collaborative. They identified five success factors that lead to successful participation.
5. Conclusion

Currently, the world faces significant challenges related to the growing proportion of elders with chronic conditions, combined with a global lack of trained clinicians. Health systems worldwide look for new ways of collaboration and for new information technologies to help them address these challenges. Thus, there is a growing need for understanding collaboration in health care and for designing technologies that support for the highly collaborative work of patient care. Through this special issue, we hope to bring to the attention of the medical informatics community of the importance for studying collaboration and designing systems that better support collaboration.

REFERENCES


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doi:10.1016/j.ijmedinf.2011.05.001