Chapter 9
Assessing Risk in Healthcare Collaborative Settings

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ABSTRACT

This chapter describes a case study addressing risk assessment in a hospital unit. The objective of the case study was to analyse the impact on collaborative work and work flow after the unit changed its design and installations, and the consequences for risk management. The Software-Hardware-Environment-Liveware-Liveware (SHELL) model, a conceptual framework for understanding the interaction between human factors (liveware), computers (software and hardware) and the environment, was used in this study. The outcomes show that the SHELL model is adequate for analyzing the complex issues raised in healthcare collaborative settings. The SHELL analysis highlighted how the relationships among doctors, nurses and assistants – expressed according to the software, hardware, environment and liveware elements – evolved in the new work setting, characterized by new working rooms, glass walls and automatic doors. This analysis shows that even small changes, such as changing the way that computers are used in the work environment, may have a significant impact in a collaborative work setting.

INTRODUCTION

Risk management in health care has developed and matured over the last many years in the United States, Britain, Europe, and Australia (Vincent, 1995, p. 2). At its origins, the focus was primarily on developing a framework for controlling litigation, a major worry for clinicians and hospitals. Studies of medical error in health care have brought a growing awareness of the scale of the problems directly and indirectly causing harm to patients (Reason, 2008, p. 92; Toft, 2001, p. 40; Walshe & Boaden, 2006, pp. 1-6). The direct financial costs of these events, in terms of additional treat-

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ment, extra days spent in hospital, and financial compensations, are clearly vastly greater than the costs of performing an initial risk management. The indirect costs associated with lost working days, health losses, disabilities, and deaths are greater still.

There is also today a much greater recognition of the human and social costs associated with medical errors. Many patients suffer increased pain, psychological trauma, depression, anger, and bitterness (Ennis & Vincent, 2008). Staff may also experience shame and guilt, as well as penalties (Grepperud, 2005). The doctors and nurses whose confidence may have been impaired may also work less effectively and efficiently.

Risk management is also at the heart of the concept of clinical governance (Walshe, 2001), a management approach making those in charge of healthcare organizations accountable for the quality of care they deliver. Risk management is therefore evolving and expanding well beyond its roots in litigation and becoming an essential decision-making instrument in health care.

With regard to technology, until the 1980s, one major goal of risk management was to limit the technical and human contributions to catastrophic breakdowns, mostly in high-hazard enterprises, such as air transportation, nuclear power generation, and chemical production (Perrow, 1999; Reason, 1997). Accidents such as the ones that occurred in the Three Mile Island and Chernobyl power plants raised much political and social concern. By contrast, medical mishaps mostly affect single individuals, albeit in a wide range of healthcare institutions, but tend to receive less attention.

Since the mid-1980s several interdisciplinary research groups have begun to investigate the technological and human factors affecting the safety of healthcare systems (Leonard, Graham, & Bonacum, 2004). Much is already known today about the complex relationships between technological failures and human error, highlighting issues related with dynamic environments, multiple sources of concurrent information, mediation effects, time pressure, information overload, attention problems, and problematic human-machine interfaces (Redmill & Rajan, 1997; Sheffi, 2007). One of the most significant consequences of the collaboration between health care and technology specialists is the widespread acceptance of models of causation of accidents (Perrow, 1999; Reason, 1995). For instance, Reason (2008, p. 97) developed the Swiss Cheese Model (SCM) characterizing the trajectory of accidents through "gaps" in a succession of defensive layers, including physical protection, engineered safety features, administrative control, protective equipment, and the frontline personnel themselves. The "gap" concept encompasses active and latent failures, the former associated with operators' unsafe acts and the latter resulting from erroneous decisions made by designers, developers and managers.

Nevertheless, as more technological advancements are brought into the health care domain, not only associated with high-tech equipment (e.g. imaging), but also with other technologies such as dynamic accounting systems, electronic patient records, workflow management, and the use of mobile devices (Tan, 2005, p. 523), these will contribute to an increased number and variety of risks. We thus expect the concern with risk management to increase in the future.

This chapter addresses the risk assessment of the impact of technology on collaborative activities in hospital settings. The focus on collaboration emerges from two major forces. The first one concerns the collaborative nature of hospital settings; hospitals have long been regarded as inherently collaborative, since various types of highly proficient individuals must orchestrate their activities, in coordinated and concerted ways, and depend on technology all along that process. As a consequence, the collaborative setting is part of the problem when mishaps occur, and thus should be carefully considered when assessing risks. The second force is associated with the increasing adoption of collaborative technology