Chapter 14
Mobile Communication in Hospitals: What is the Problem?

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ABSTRACT

The work setting in hospitals is communication intensive and can lead to significant difficulties related to interruptions from co-workers. Physicians often need information fast, and any delay between the decision made and the action taken could cause medical errors. One suggested solution for this problem is to implement wireless phone systems. However, psychological theory and empirical evidence, both suggest that wireless phones have the potential of creating additional problems related to interruptions, compared to traditional paging systems. The fact that hospital workers prefer interruptive communication methods before non-interruptive methods, amplifies the risk of overloading people when phones are widely deployed. This challenge causes some hospital staff to resist the diffusion of wireless phones, and a key is how to handle the balance between increased availability, and increased interruptions. In this chapter, the authors present solutions based on context aware communication systems, aiming to reduce interruptions.

INTRODUCTION

We know from earlier studies within health care that physicians in hospitals are interrupted unnecessary by mobile devices in situations where such interruptions should be avoided (Scholl, Hasvold, Henriksen, & Ellingsen, 2007; T. Solvoll & Scholl, 2008; Terje Solvoll, Scholl, & Hartvigsen, 2010, 2012). Unnecessary interruptions can cause concentration difficulties and disturb the activity performed (Hersh et al., 2002). Unwanted interruptions should be minimized in order to avoid

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distraction that can lead to intolerable action or decisions, especially during surgery or patient examinations. This is a problem in today's hospital settings, and a solution to reduce such unnecessary interruptions from mobile devices is needed and wanted (T. Botsis, T. Solvoll, J. Scholl, P. Hasvold, & G. Hartvigsen, 2007; Scholl, et al., 2007; T. Solvoll & Scholl, 2008; Terje Solvoll, et al., 2012). A lot of research has been done within this area, some of this work will be presented in the next sections, but we cannot see that the situation has changed to the better. In this chapter we will present some earlier work on context sensitive systems for mobile communication in hospitals (internal communication systems, not including public networks (GSM/3G) enabling the use of Blackberries, Iphones, Ipads etc.) that aims to improve the communication situation and also reduce interruptions.

BACKGROUND

Physicians' working conditions rely on mobility. They move frequently between in-patient ward, out-patient ward, emergency ward, operating theatres, etc., and often do not stay more than a few minutes in the same location. High mobility requires mobile communication systems, which enables physicians to communicate with colleges at any time and place, to avoid any delay between the decision made and action taken. Such delays could result in medical errors (Hersh, et al., 2002), and mobile communication systems have been suggested as a solution to improve communication in hospitals (Coiera & Tombs, 1998). The challenge when deploying mobile communication systems is to handle the balance between the increased availability and possible interruptions (Scholl, et al., 2007; T. Solvoll & Scholl, 2008; Terje Solvoll, et al., 2010, 2012). Most hospitals still rely on a mobile communication infrastructure with dedicated devices for each role, where pagers are the most dominant mobile communication device.

Pagers provide a cheap and reliable way for contacting staff. They are ubiquitous and several physicians carry numerous pagers simultaneously to cover the various work roles they have been assigned. Pagers suffer from a number of problems due to their simplicity. The most obvious limitation is that it requires the staff to locate a telephone (landline or wireless) in order to respond to a page. This might cause unnecessary delays and communication overhead, since the person placing the page is not always near the phone when the page is returned (Spurck, Mohr, Seroka, & Stoner, 1995). Pagers also create a large amount of unnecessary interruptions (Blum & Lieu, 1992; Katz & Schroeder, 1988), which is unpleasant and can cause medical errors (Hersh, et al., 2002).

The most intuitive solution to improve the communication situation in hospitals is to provide physicians with wireless phones. However, phones can be even more interruptive than pagers (Scholl, et al., 2007; T. Solvoll & Scholl, 2008; Terje Solvoll, et al., 2010, 2012). In (Scholl, et al., 2007) a physician states that; "with a pager you just have to glance down at your coat pocket to see who is paging, while with a phone, you have to pick it up from your pocket to see who is calling. Having done that, it is easier just answering and explaining that you are busy" (T. Solvoll & Scholl, 2008).

Preliminary studies points at a diversity of potential benefits from wireless phones in hospital settings, using both mobile text and voice services (Acuff, Fagan, Rindfleisch, Levitt, & Ford, 1997; Eisenstadt et al., 1998; Minnick, Pischke-Winn, & Sterk, 1994 ; Spurck, et al., 1995). These studies also reveal potential technological limitations that can explain some of the challenges of gaining acceptance. Text-chat is a less obtrusive medium than other forms of workplace communication (Bradner, Kellogg, & Erickson, 1999). It is therefore unlikely that mobile text-messaging creates the same amount of interruptions as mobile voice