Development and application of the RFID system for patient safety

Eun-young Jung[a,c], Rae Woong Park[a], YongSu Lim[b], KugSang Jeong[b], DongKyun Park[b]

[a] *Department of Medical informatics, School of medicine, Ajou University, Korea,*
[b] *U-Healthcare center, Gachon University Gil Hospital, Korea*

Abstract and Objective

Radio Frequency Identification (RFID) has been considered as an innovative technology to advance patient safety in the hospital. In order to improve medical accidents related to information mishandling of surgical patients, blood transfusions, and anti-cancer medication, we developed an RFID system that can be used in general hospitals. Our survey on the RFID system with 63 nurses and 20 patients who actually experienced the RFID system revealed a high level of satisfaction in terms of reinforcing the patient's safety in medical environments. Nurses surveyed had intention to utilize the RFID system for managing hospital assets and tracking patients later. For the full scale application of RFID system in hospitals, it is important to ensure information system stability, including the network system, and quantitative analysis of the effects of the system.

Keywords:

RFID system, Patient safety, Medical error.

Introduction

Radio Frequency Identification (RFID) has been considered as an innovative technology to advance patient safety in the hospital. According to Das [1], about 10% of patients encounter with medical accidents, great and small, and 50% of them are related to medication errors, which can be substantially improved by RFID. Here, we describe our approaches of developing and applying RFID systems for general hospitals to improve medical accidents related to information mishandling of surgical patients, blood transfusions, and anti-cancer medication.

Methods

The RFID system was applied to reaffirm patient information in the peri-anesthetic care unit prior to surgery, blood transfusion, and anti-cancer medication. For wireless communications, the RFID system used 13.56MHz of spectrum bandwidth and tags complying with ISO 15693 standards. As for tag readers, PDAs were used in the intensive care unit and laptop computers in the anesthesiology department/general wards. We conducted a survey on the RFID system with 63 nurses and 20 patients who actually experienced the RFID system.

Results & Conclusions

When measured on a Likert 5-point scale, patient attitude and inconvenience toward the disclosure of personal information by wearing the RFID tag scored 3.7 ± 1 (SD), representing "slightly satisfied." The question whether patients can tolerate any inconvenience if they have to wear the RFID tag for safety scored 4.5 ± 1 (SD). The question whether patients understand that the RFID tag discloses patient information scored 4.3 ± 1.2 (SD). 79.1% of nurses surveyed responded that the greatest advantage of the RFID system is increased safety of patients. On the other hand, 55.8% of nurses surveyed responded that network breakdown is the major drawback. In addition, 45.3% of nurses surveyed wanted to apply the RFID system for the management of assets and office supplies. Users of the RFID were satisfied with the contribution of the RFID system to reinforcing patient safety. The majority of patients were willing to tolerate any inconvenience and disclosure of their information, in addition to the other treatment measures discussed above, if the RFID tag helped enhance their safety. For the full scale application of RFID system in hospitals, it is important to ensure information system stability, including the network system, and quantitative analysis of the effects of the system.

[1] Raghu Das. RFID in Healthcare 2006-2016. IDTech EX 2006.