



RFID in the HealthCare Industry

by: Tom DeFrange, RCDD

Hospitals today are under increasing pressure to reduce costs and increase the quality and efficiency of patient care services. Many healthcare facilities are implementing radio frequency identification (RFID) to help meet these challenges. RFID is an electronic monitoring system which can help provide better asset management as well as patient flow and productivity reporting.

In the past, RFID has been highly utilized for equipment tracking, theft prevention and asset management within the healthcare industry. Recently, the full potential of RFID has been recognized, and as software applications for managing system components and reporting capabilities are further developed, the utilization of RFID will continue to expand. Some of the key benefits and points of interest surrounding RFID that seem to be catching the eye of the healthcare technology industry today include:

Physical Equipment Asset Tracking and Asset Management

Each day, countless hours are wasted locating mobile equipment. With the advancements in RFID, a well-distributed “zone” antenna system can quickly provide information on the location of any actively tagged piece of equipment. This ability to minimize the time required for both critical and non-critical searches affects the patient's wait time, the staff's required time and the overall clinical rate of productivity.

The “zone” level RFID antenna is not as dense as a “room by room” level and can typically narrow down the location of an active RFID tag within 5 to 10 meters. This is a cost-effective option if physical asset management and tracking are the key focal points of installing the system.

Patient Tracking and Flow Productivity

In addition to asset tracking and asset management, RFID has the capability to monitor patient flow and identify bottlenecks within the organization. By implementing a “room by room” level distributed antenna system, a patient's whereabouts can be quickly identified within 1 meter of his/her actual location at all times. This is critical when locating a lost pediatric or misplaced patient. A “room by room” level system can also provide the department or clinical administrator (depending on the software type and capabilities) the ability to run productivity reports on patient flow. For example, an ambulatory clinic with over 1200 patients per day can run a simple RFID report and produce data based on:

- when each patient checked in
- how long each patient was in the waiting room
- how long each patient was in an exam room
- how much time the physician spent in the exam room with the patient
- length of the overall visit

RFID IN THE HEALTHCARE INDUSTRY *Continued*

This information can then be calculated to provide the healthcare organization with the average percentage of time a patient spent waiting versus actually being attended to by a member of the clinical staff.

Multi-Use RFID Tags (Staff Paging)

Some manufacturers of RFID system components have recognized additional services that can be provided through the active tags carried by staff members. In conjunction with the ability to quickly locate a physician or staff member, some RFID systems are capable of paging physicians and nurses within the facility to aid with response time. In its current stage of development, the RFID paging capabilities are limited to an indicator (light/sound) and a notice of the end users specified location. Elementary as it may sound, often an additional means of contacting a physician or staff member can prove to be extremely valuable.

Cost-Effective Infection Control Issues

The development of a cost-effective RFID system implementation is not without significant challenges. For instance, in an outpatient environment, the potential cost of providing a disposable (1-use) RFID tag to a high volume patient flow can limit the ROI of the system. The initial cost of a disposable RFID tag can be absorbed if utilized for multiple (average 8 or more) patients within the expected term of battery life (approximately two weeks), but reusing tags presents an even greater concern, infection control. Therefore, RFID device infection control requirements need to be clearly identified by the end user and communicated to

the selected manufacturer to ensure that a disposable tag can sustain operability once it has been through the sterilization process. One solution being investigated is an RFID tag inserted into a disposable, low-cost shell.

Organizations may decide to purchase the longer lasting (2-year battery) RFID tag if the “shell” solution is further developed where the multiple use and sterilization of each device can be managed effectively.

Current Wireless LAN RFID

As RFID technology is further developed, it is extremely important to understand what resources are available within the organization’s existing Wireless LAN. Depending on the network delivery vendor, software and/or hardware updates may already exist or be in the design process that will allow the end-user to implement an RFID system through the current distributed a/b/g wireless antenna system. It would be unfortunate to invest in an RFID system, have it installed and implemented, only to find out your current network just released a software upgrade that can provide you the same RFID service through the existing Wireless LAN.

There are a number of RFID solutions currently on the market. While similar in technology, these systems have different capabilities and uses. The hospital staff should first identify their needs and primary expectations for the system, and then choose the manufacturer whose system is capable of best meeting these requirements.



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