RFID Systems in Healthcare: Emerging Uses and Potential Issues

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Radio frequency identification (RFID) systems are becoming more prevalent in healthcare. HIM professionals who serve as privacy or security officials within their organizations should be familiar with these systems and their role in obtaining and tracking patient information.

This article discusses the uses of RFID systems in and out of healthcare, as well as some of their potential vulnerabilities.

RFID 101

RFID systems were first developed in the 1920s and have evolved significantly over the past 80 years. RFID is an advanced form of automatic identification and data capture (AIDC), best known for its use in bar codes. AIDC technology employs optical scanners to read identifying information contained in images. It requires that someone manually wave the scanner directly over the image (or conversely, wave the object over the scanner). This technology can be found in most retail checkout lines.

RFID technology does not require a scanner because it depends solely on radio frequency. A microchip (known as an RFID tag), which can be programmed with a variety of information such as name, account number, or other sensitive information, is inserted into or on an object. The data are read by an RFID reader once the object is within range.

Ranges can be set at varying distances. RFID technology could enable us to one day check out of the grocery line without removing anything from the cart. Once you are close enough, the RFID reader could read the signal of every item in your cart and total the amount due.

Currently RFID technology is being used in aircrafts, inventory tracking, and electronic tolling. It is being discussed for identification purposes in passports, driver's licenses, and government documents.

RFID in Healthcare

The healthcare industry tends to adopt and implement new technologies at a slower pace than other industries. However, many facilities are already planning and testing RFID technology, and some have already implemented it.

One current use is in the pharmaceutical industry where various prescription drugs can be tracked from creation to receipt by consumers. This helps alleviate drug counterfeiting, theft, and misuse of medications such as controlled substances.

Another use of RFID in healthcare is the tracking of inventory and equipment such as surgical sponges and monitors. Spartanburg Regional Medical Center in Spartanburg, SC, implemented an RFID system to track and electronically record the location of 550 IV pumps. As a result, the facility located 25 pumps in storage and was able to cancel an order for 50 pumps costing $10,000 each.[1]

Other uses include tracking staff for response purposes in the event of an emergency for treatment, tracking lab specimens, and tracking patients. Tracking patients is beneficial not only for registration and positive identification, but also in securing and protecting infants and other vulnerable patients.

Tracking a patient's location while in the hospital or during treatment provides a level of security and safety that contributes to the patient's overall care and well-being. Vendors already offer applications that embed RFID tags into patient ID bracelets.

Verichip has developed a tag for patients that is implantable beneath the skin. The vendor is in the process of launching a patient registry service in selected areas of the country. The chip is implanted underneath the patient's skin between the elbow and the shoulder. It contains a pre-assigned 16-digit identification number that physicians can access by scanning the patient with a reader. The physician then enters the same 16-digit number into a Web-based patient registry database to access the patient's medical record.[2]

One of the primary barriers to RFID in healthcare is cost.

Privacy and Security Concerns

The transition of so many manual processes to automated ones brings benefits as well as potential vulnerabilities. RFID technology introduces several new concerns that HIM professionals should consider.

Just as computers can be hacked by viruses and other malicious malware, RFID tags can be hacked, read, and corrupted. RFID tags are read and identified by designated readers established within specific reading ranges based on regulations and standards. All a hacker would need to read and identify information on an RFID tag is more power. A hacker can obtain the information by increasing the reading range. Hackers can also create malicious content on tags, which is almost impossible to detect.

An RFID tag can contain any type of information, such as patient number, room number, or home address. Depending on the type and quantity of information programmed onto an RFID tag, accessing the information could be a privacy issue. If the information is altered or somehow destroyed, that could result in a security issue. In technology systems, a privacy breach is likely preceded by a security breach.

RFID systems can be protected with security measures such as firewalls, encryption, and authentication methods to help facilitate the security of information contained within RFID tags. The National Institute of Standards and Technology publication "Guidelines for Securing Radio Frequency Identification Systems" offers practices for maintaining and controlling RFID technology.[3]

The institute recommends minimizing the data stored on an RFID tag. It also recommends that instead of placing sensitive data on tags, organizations store data in a secure enterprise subsystem and retrieve data using the tag's unique identifier.

Although some regulations and standards do exist regarding RFID technology, the needs of protected health information still require further considerations and guidelines. These guidelines are needed not only from a technological sense, but also to facilitate privacy and security as well. HIM professionals should follow the developments of RFID in healthcare and offer guidance on privacy and security issues within their organizations. v

Notes

1. Merrill, Molly. "Southern Hospitals Give RFID System the Thumbs Up." *Healthcare IT News.* August 21, 2007. Available online at www.healthcareitnews.com/story.cms?id=7625.

2. "VeriChip Goes Direct to Consumers." *Health Data Management.* September 4, 2007. Available online at www.healthdatamanagement.com/news/15699-1.html.

3. National Institute of Standards and Technology. "Guidelines for Securing Radio Frequency Identification Systems." April 2007. Available online at http://csrc.nist.gov/publications/nistpubs/800-98/SP800-98_RFID-2007.pdf.

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