



RFID Technology In The Blood Tracking Process

How hospitals and blood centers are leveraging RFID to improve patient safety and trim costs.

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A growing number of hospitals and blood centers are leveraging a new ally in their critical blood tracking work, using radio frequency identification (RFID) solutions to enhance patient safety, improve efficiency and trim the costs associated with monitoring and tracking this life-saving and perishable resource.

Every two seconds, someone in the United States needs a transfusion, according to the Red Cross. Managing all that blood--and avoiding errors--is a major concern for blood centers and hospitals, many of which rely on a combination of barcodes and note taking to track the millions of units of blood and blood products donated and used each day.

One blood center's processes can involve thousands of collections every day, each of which generates a number of test tubes and paperwork. Since each byproduct is considered a bio-hazard, the government requires that facilities track each fluid and item--such as vials, needles and blood bags--associated with each donation, creating even more paperwork. According to the National Blood Data Resource Center, U.S. institutions collected more than 15 million units of blood products in 2001. While this is the most recent year of available data, the amount is notable to display how much time is needed to track and record each donated item.

Organizations must also carefully store blood, since some components have a very short shelf life. Platelets, for example, can be used for only five days after donation, while red blood cells can be refrigerated and used for up to 42 days, according to the Red Cross. On the other hand, frozen red blood cells can last up to a decade, but the cost is prohibitive, the organization notes. Plasma, however, typically is frozen but must be used within 12 months. Therefore, to ensure timeline regulations are met, blood product inventory must be carefully managed and controlled.

Hospitals typically do not process the same volume of blood products as the blood centers. They are more concerned with patient safety, expending much of their time ensuring the blood matches the individual, and the individual matches the wristband. According to the Institute of Medicine and other leading healthcare organizations, a significant number of the 98,000

annual deaths caused by medical errors in the U.S. are due to transfusion mistakes.

In fact, a patient receiving the wrong blood due to a mismatch between the patient and the donor is estimated to happen in one out of every 14,000 transfusions, according to the U.S. Food and Drug Administration (FDA). This rate has stayed the same over the past 20 years, despite medical providers' investment in barcode systems designed to replace or augment traditional manual systems.

Also spurring interest and importance in RFID technology is the federal government's healthcare reform, which will place additional stress on blood centers and hospitals to control costs, justify expenses, tighten review of clinical outcomes from activities such as transfusions, and improve patient care.

The ABCs Of RFID

Unlike barcode systems, RFID solutions do not need line-of-sight to collect information, and are able to read the data from tagged items from a distance and through physical barriers such as boxes or bags. Typically, RFID systems consist of a tag, or identification device that is attached to the item being tagged, a reader, which reads and processes the tag's information, and an antenna, which helps the two devices communicate with each other.



Sometimes called transponders, tags may be passive, active, or semi-active/semi-passive. Passive tags have no battery, receiving their power solely from the reader's radio frequency signal. Active tags have a battery and transmitter, while the semi-models have a battery and typically use the antenna's radio frequency to wake-up and communicate.

With barcodes, the barcode scanner must be aligned properly in order to accurately scan the barcode. With RFID readers, there is more leeway, making the process faster and more efficient.

Last year, the entire RFID market--including tags, readers, software and services--grew to \$5.63 billion, compared with \$5.03 billion in 2009, according to IDTechEx , a research firm.

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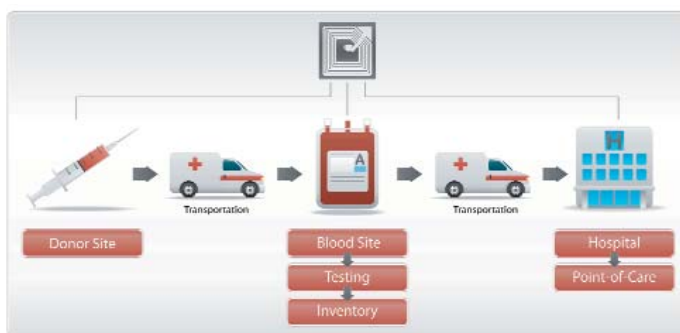
Most growth occurred in the use of passive UHF tags, often used in asset tracking, the firm found. In 2010, about 800 million passive UHF tags were sold while 550 million sold a year earlier, IDTechEx revealed, and at least two passive UHF tag suppliers have increased their prices for the first time and are installing extra capacity.

Healthcare organizations will spend \$1.43 billion on RFID in 2019, up from \$94.6 million in 2009, according to an IDTechEx report, highlighting the necessity of RFID to the medical industry generally, and blood tracking specifically.

Pooling Resources

Within the vital area of blood-management, hospitals and blood centers can improve the quality of care, reduce errors, and simplify management of blood and blood products. RFID can help eliminate the risk of mismatch between patient and blood, the most prevalent and serious risk in transfusions today.

The Transfusion Medicine RFID Consortium is engaged in the first comprehensive investigation to research, develop and introduce the innovative application of RFID for the automatic identification, tracking and status monitoring of blood and blood products across the blood supply chain. This includes RFID tagging of blood products at the point of collection, scanning the product at various points as it moves through the manufacturing and distribution process, and ultimately scanning by a healthcare provider at the patient point of care.



The Consortium consists of healthcare professionals such as the BloodCenter of Wisconsin, Baptist Health Systems and the University of Iowa Hospitals and Clinics, in partnership with hardware developers such as Unitech, a global provider of healthcare specific rugged mobile computers and scanners with

antimicrobial and disinfectant-ready housing, as well as software providers like S3Edge, who develop auto-ID based asset tracking solutions for automation and error proofing of supply chain operations in the medical market.

"Our goal is to help the transfusion medicine community ensure that the right product gets to the right patient at the right time," said Jackie Fredrick, BloodCenter president and CEO. The BloodCenter received a grant from the National Institutes of Health, Health and Human Services in 2009, to begin the investigation into RFID. "This project fits well with our focus on translational medicine, creating a bridge between basic research and clinical applications."

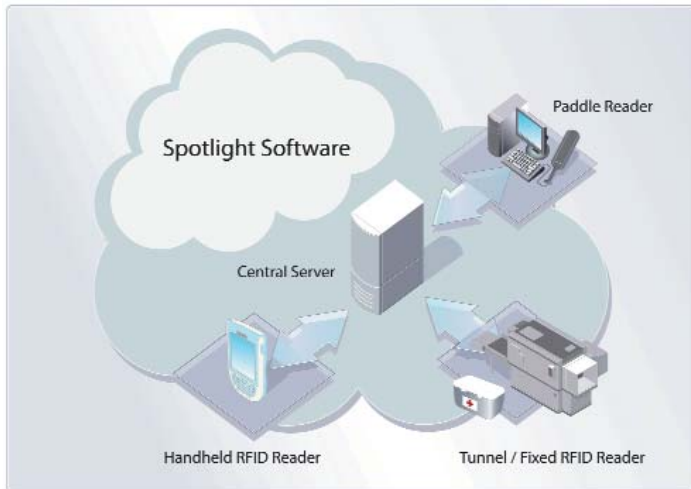
Tapping the power of the Internet and today's sophisticated, secure and easy-to-use smartphone technologies, S3Edge is designing a suite of web-based and mobile applications designed specifically for blood banks and hospitals. These programs will automate collection check-in at donor sites, eliminating errors during the receipt and release of blood products at blood centers. The applications will also give authorized users granular visibility of all blood products as they move from the donor site to the blood center, all the way to the patient's bedside in the hospital room. This process will ensure patient safety by verifying the healthcare professional is administering the right product to the correct patient at transfusion time.

Hospitals will also save money, according to Lynne Briggs, director of applications and project manager at the BloodCenter of Wisconsin, in a recent RFID Journal. Briggs claims that, because of the volume hospitals work with, an RFID-based blood-tracking system could pay for itself within two to three years. And that does not include the incalculable cost of saving a life.

Building A Solution

Blood banks or hospitals looking to implement an RFID solution would require a central server, network-attached RFID/barcode readers, and packaged Spotlight Mobile software from S3Edge. The readers typically are a combination of handheld RFID barcode readers, fixed tabletop readers, tunnel readers and paddle readers. S3Edge Spotlight and Spotlight Mobile software are accessed via a secure website using a standard web browser, and are visible to users through a standard workstation, or a Windows-based handheld RFID reader that is connected wirelessly to the central server.

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As a result, blood centers and hospitals can track the physical movement and information about a blood product from the moment it is donated until it is transfused.

"By using a handheld computer with an RFID tag reader, and tag writer, mobile blood donation site teams can more quickly and more accurately prepare blood product collections for shipping to the blood center," said Jamie Shipley, Healthcare Sales Consultant at Unitech.

"With RFID, a user scans the blood bag's RFID tag once to obtain all the International Society of Blood Transfusion (ISBT) information instead of using a barcode scanner to read four separate ISBT barcode labels," says Mark Anastas, president of S3Edge. "There's up to a four to one reduction in the number of scans required and a subsequent increase in efficiency and productivity. When we actually check-in products from the donation sites, tunnel readers are used to scan all the RFID tags in an entire cooler filled with blood bags without requiring each bag to be removed and scanned individually. In that case, instead of standing there and reading 150 or 200 barcodes, you can easily check in all the blood products instantly," informs Anastas. "You lower costs by increasing the speed at which

blood products are processed through the supply chain. The information stored in the RFID tag's memory can also be modified on the fly as well."

"Hospitals, less likely to deal with the same volume, focus on patient care and monitoring blood product inventory in remote locations," says Anastas. "With RFID, facilities can track the movement of blood from the point of receipt to administration at the bedside or placement in remote storage locations such as operating and emergency rooms. Nurses can easily check the patient's wristband against the information on the transfusion bag to ensure it is the correct product," according to Anastas.

The Right Frequency

No matter whether blood centers and hospitals seek cost reductions, improved efficiencies or even better care, they can both benefit from adding RFID solutions to their blood-tracking systems. Ultimately, RFID solutions deliver a cost-effective, proven way for medical facilities to further bolster the safety of their blood supply--and the health of their patients. ●

About Unitech

With a commitment to improving customer productivity and efficiency, Unitech, a leading provider of data collection technologies for diverse industries around the globe, provides healthcare-specific rugged mobile computers and scanners with antimicrobial and disinfectant-ready housing. Designed for healthcare applications from the inside out, these devices are ideally suited for point of care and pharmaceutical applications.

Founded in 1979, Unitech began as a provider of custom microprocessor-based automation systems for the Taiwanese market. Today, Unitech's products and services are sold and licensed through a network of over a thousand partners throughout the world, and include rugged mobile computers, handheld scanners, RFID readers, POS keyboards, magnetic stripe readers, and fixed mount terminals. Unitech currently maintains regional business units in North America, South America, Europe and Asia.