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RFID advance to improve safety of nation's blood supply

MADISON — A six-year collaboration between industry and the University of Wisconsin-Madison RFID Lab achieved a major milestone this week with the Food and Drug Administration (FDA) clearing the first RFID-enabled solution to improve the safety and efficiency of the blood supply.

The UW-Madison RFID lab was one of three lead Wisconsin partners in the project, including the BloodCenter of Wisconsin and SysLogic Inc., a Milwaukee-based information systems provider. Together, the team researched, designed, developed, and tested a new RFID-enabled solution called iTrace for Blood Centers, which will automatically identify, reconcile and track blood products. The iTrace for Blood Centers software is now available for use in the nation's blood centers, with eventual plans to employ in hospitals with further FDA approvals of iTrace for hospitals.

The UW-Madison team was instrumental in conducting tests to validate the safety of Radio Frequency Identification (RFID) technology with the blood supply, demonstrating no adverse impacts such as temperature or biochemical changes. RFID technology is used in scores of applications for tracking movement and status of products, but this is the first FDA-approved application involving blood products in healthcare.

“For RFID to be adopted across the industry, the safety of its use on blood was a fundamental question to be answered,” says Raj Veeramani, professor of industrial and systems engineering and executive director of the UW E-Business Institute. “Blood is a life-giving product. This advance in managing the blood supply chain will create huge value since you’re dealing with something that is a matter of health security and is so important to every society.”

In addition to demonstrating the safety of RFID with blood products, the UW-Madison team, led by RFID Lab Director Alfonso Gutierrez, investigated the reliability and efficiency of the technology. In a process that today requires a lot of manual identification and trouble-shooting, RFID will enable the healthcare industry to re-engineer the blood supply chain processes with greater automated controls.

“The big advantage will be elevating the visibility of the blood product, where you can very clearly track where it came from, and where it’s going,” Gutierrez says. “Blood is a highly regulated substance and needs to be accounted for throughout the entire distribution process. We’ve made that more transparent with iTrace.”

Veeramani notes that the safety and integrity of the blood supply is critical to quality healthcare, and RFID tracking may help reduce common errors.

“The system developed by the Transfusion Medicine RFID Consortium is the very first end-to-end solution to the entire supply chain of transfusion medicine, from collection through blood centers to hospitals,” Veeramani says. “We came up with a blueprint of what an RFID-enabled process would look like at every stage in the supply chain.”

A third contribution of the UW RFID Lab involved validating the business case for RFID adoption. They first reviewed the financial return-on-investment in terms of expected cost savings, reduced waste, and productivity improvement. More importantly, they developed a model to assess return-on-investment in terms of improved patient safety, with fewer errors and adverse outcomes, some potentially life-threatening.

Gutierrez says the university-industry team also helped the International Society of Blood Transfusion (ISBT) RFID Working Party establish global standards for the use of RFID in the blood supply chain. The iTrace solution is the first to adopt these standards in its design.

Support for the project includes \$1.5 million from the National Institutes of Health Small Business Technology Transfer (STTR) program, as well as grants from the America's Blood Centers (ABC) Foundation and industry partners. The primary goal of STTR is to fund university-business collaborations that will lead to commercialization of new technology.

Additional partners in the Transfusion Medicine RFID Consortium that conducted this project included S3Edge, Carter BloodCare, Mississippi Blood Services, the University of Iowa/DeGowan Blood Center, and Mississippi Baptist Hospitals.

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