Intelligent Radio Nodes To Track Medical Biologics, Devices

German scientists have developed intelligent radio nodes to be attached to blood bags, medical devices. The technology could be next step up from RFID in facilitating device management in hospitals.

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Have the blood supplies got too warm? Do they match the patient's blood group? In the future, these kinds of questions will be answered by intelligent radio nodes attached to blood bags. These radio units could also greatly facilitate device management in hospitals.

In December 2009, Medgadget [1] reported that German scientists have been working on special "radio nodes" that would keep track of items they are attached to and signal if certain parameters are met. In the case of blood bags, clinicians would be notified if a bag came out of its safe temperature range, for how long and whether it should be disposed.

According to the press release announcing this technology issued by Fraunhofer-Institut für Integrierte Schaltungen [2], when the blood supplies kept on hand in the OR in case patients lose a lot of blood are not needed, they can only be reused if the cold chain has been maintained.

Until now, monitoring this cold chain has been often been difficult for facilities. However, these new radio nodes attached to the blood bag will have the ability to monitor the temperature of the blood at all times to ensure that most of these blood supplies can be reused.

According to the researchers, the radio nodes should also help to improve safety. For example, the radio nodes attached to the bags and to the patient wristband can exchange information. If the donor blood does not match the blood of the patient, a warning sound alarms and a red light appears. This helps prevent errors during

blood transfusions.

As the press release states, the intelligent radio nodes were developed by researchers at the Fraunhofer Institute for Integrated Circuits IIS and the Fraunhofer Working Group SCS in collaboration with their partners T-Systems, Vierling, delta T and the University of Erlangen-Nuremberg. The project is funded by the German federal ministry of economics and technology (BMWi).

“In contrast to tags that use RFID—radio frequency identification—we do not expect intelligent radio nodes to interfere with hospital medical devices,” explains Jürgen Hupp, head of communication networks department at IIS. “While the transmit power required for RFID tag reading can be as much as two watts, radio nodes only transmit in the milliwatt range.”

According to the release, RFID tags consist of a memory chip and antenna. In order to read an RFID tag, it must first be activated by the reader. In contrast, an intelligent radio node is an active radio system that is battery-powered and has its own processing unit. Radio nodes can continuously gather information and trigger actions.

The researchers say the system is built upon a basic platform which can be tailored to different applications. One example involves using radio nodes to optimize the management of medical devices in hospitals. Devices such as syringe pumps and cardiac monitors often move between departments and can be hard to track down when they are needed. Attaching radio nodes to the devices could help to report their position automatically.

“Hospitals can get by with fewer devices, eliminate unnecessary time-wasting and cut costs,” states Dr. Alexander Pflaum, department head at SCS. A six-month test phase is set to begin at Erlangen University Hospital in January 2010, and the Opal Health system could be ready for use in around two years.

Sources: Medgadget [1]; Fraunhofer-Institut für Integrierte Schaltungen [2]

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