

Jena University Hospital Prescribes RFID to Reduce Medication Errors

The German hospital is beginning a pilot designed to track individual antibiotic prescriptions from the pharmacy to the patient.

By Rhea Wessel

June 1, 2007—After more than a year of preparation, Germany's [Jena University Hospital](#) will launch a pilot this month to track medication for patients in the intensive care unit (ICU). The pilot will use high-frequency (HF) RFID tags to track antibiotics from the point of dispensing in the hospital's pharmacy until administration to patients. About 150 tags per day will be used on medication for 25 patients.

Jena designed the system together with [SAP](#) and [Intel Solution Services](#), based on SAP's NetWeaver software and its Auto-ID Infrastructure platform. The hospital, which has more than 1,000 beds, is implementing the tracking system to improve the efficiency of its treatment process and enhance drug-handling safety—that is, to ensure patients get the correct doses of the right drugs (see [German Hospital Expects RFID to Eradicate Drug Errors](#)).

In mid-2006, the hospital's RFID project team began selecting hardware vendors and integrating the RFID system with its patient information database and other back-end software. The implementation was initially slated for completion in October 2006, but the hospital has since made several changes to the project.

For example, says Martin Specht, formerly a head doctor in the hospital's anesthesiology and intensive care clinics and now the head of the electronic data processing division, Jena had intended to use UHF tags so it could perform bulk tag reads on medications. However, since many medications are liquids—which can interfere with RF signals—read rates were not as high as the hospital had hoped for. The project team then tested tags operating at high frequency and decided to employ HF tags instead of UHF. Using HF tags from [UPM Raflatac](#), Specht says, the hospital has now achieved accurate reads on individual items 98 percent of the time.

The hospital had designed the RFID system to work in conjunction with its in-house transport system, a network of conveyor belts linking various medical units. That, however, would have required RFID portals to be positioned over the conveyor belts, which Specht says would have been too costly to permit expansion of the RFID system throughout the hospital. "Using portal readers," he explains, "would have meant we had to, in the end, equip three doors—i.e., the three possible entrances to the intensive-care ward."

Instead, the hospital opted to utilize handheld and fixed RFID interrogators, relying on robots that push supplies around the hospital in trolleys to transport the drugs from the pharmacy to the ICU.

Jena's doctors submit patient prescriptions into the hospital's electronic prescriptions system, implemented nine years ago in an effort to reduce medication errors. The in-house pharmacists access the prescriptions via computer, then prepare each patient's correct medication dosage. With the new system, pharmacists will affix

RFID tags, encoded using a Zebra printer, to each sealed packet of an individual dose of medication or bottle of medicine. The packets and bottles will then be put into plastic containers, which will also be tagged.

Once a container is full, all the tags (both on individual prescriptions and on the container) will be read by a fixed interrogator provided by Deister Electronic. The reader will document the prescriptions, exact pill counts, intended patients and other details in the patient information database. The containers will be loaded into a trolley (also tagged), and a pharmaceutical assistant will use a handheld interrogator made by Datalogic to read the tags applied on the containers and the trolley. The patient information database will then be updated with the time of departure for all medications.

RELATED_ARTICLES When the antibiotics arrive at the ICU, nurses will use handheld readers to scan the trolleys once more, documenting the medications' arrival. The nurses will then unload the containers and bring the appropriate medications to the patients' beds. At bedside, nurses will use the handheld scanners to read the RFID tags on their employee ID badges, as well as the tag on each dose of medication and the patient's RFID-enabled wristband. All the tags' unique identification numbers will be cross-checked in the hospital's patient information system to ensure the nurses administer the correct medicine to the right patient at the proper time. The system will then be updated to show that the antibiotics have been administered.

As the pilot gets underway, Jena University Hospital hopes it will better understand how well RFID technology can work within the hospital's workflow. "We are curious to see how the new system will be accepted by nurses," Specht says, "but we are very optimistic after the positive pretests with our head nurse."

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