Japanese Hospital Trials UHF Patient Wristband

Japan’s Mie University Hospital and automatic-identification technology company SATO are testing SATO’s new ultrahigh-frequency (UHF) RFID wristband to ensure its safety with patient-implantable devices, as well as determine how the technology may improve staff efficiency and patient comfort. The wristband, which the company has been developing for the past year, is commercially available now, according to Hiroyuki Konuma, SATO Healthcare’s president.

While SATO traditionally offered a high-frequency (HF) RFID-enabled wristband (the more common RFID frequency for bracelets, the company reports), it has been working on a UHF version to enable the simpler, more accurate data verification, without requiring a staff member to bring a reader within physical contact of a patient’s wristband.

Mie University Hospital
While there are UHF RFID wristbands currently available on the market, Konuma says, their effectiveness can be compromised with the presence of liquid in the human body, making the read rate too low to be reliable. His company has been working to
create a solution, he adds, and has developed the wristband with an RFID chip that responds well to interrogations in the presence of liquids. He declines to name the chip and inlay provider, but says the proprietary engineering in the wristband has made it possible for the tag to be read at a high rate, despite its proximity to the human body.

SATO Healthcare’s Hiroyuki Konuma

The next step for the wristband, Konuma says, is to confirm that 920 MHz (250 mW) RFID transmissions from mobile readers do not affect the operation of pacemakers or other patient-implantable medical devices. To that end, it teamed up with one of its customers, Mie University Hospital, to launch a clinical study, which began in December 2016 and is slated to continue for two years.

“The first purpose is to establish that RFID doesn’t affect the functionality of the medical devices,” Konuma states, while the second goal focuses on learning how much simpler and more accurate the system makes the verification of patient identification, as well as the linkage of a patient with a particular medication, easy and comfortable for that patient and for nurses. The Japanese Ministry of Internal Affairs and Communications has already found that RFID transmissions by handheld readers do not affect medical device function, he notes; however, the company sought to confirm those results.

The hospital is now providing a SATO UHF RFID wristband to every patient who arrives at the facility. Those 18 years of
age or older who have an implantable device, and who consent to participate, are also having their devices tested at the end of their stay, in order to confirm that those devices have not been impacted by the bracelet.

Mie University Hospital, located in Tsu, Japan, serves 20,000 patients annually, including children and adults. Until September 2016, it had used a bar-code-based system to identify every patient. However, the hospital is interested in utilizing an RFID solution that would reduce the need to disturb sleeping patients in order to scan their wristbands (a UHF RFID reader could capture a tag ID from a distance of several meters, although the read distance for the trial is set at just 10 centimeters) and prevent errors that may have previously occurred due to smudged or damaged bar codes.

During the pilot, each adult patient receives the new SATO UHF RFID wristband, the unique ID number of which is linked to that individual in the hospital’s software. Each nurse wears a UHF RFID badge as well, also with a unique ID linked to his or her ID. Lastly, a tag is attached to each injectable medication.

SATO’s new UHF RFID wristband ensures safety with patient-implantable devices. A nurse who needs to identify a patient can use a handheld
reader to capture that person’s ID number and confirm his or her identity. If the patient requires an injectable medication, the nurse reads the tag ID numbers on her badge, the medication and the patient’s bracelet. The reader need not be held within close proximity to the tags to accomplish this. That data is then collected in the hospital’s software to create a permanent record of which medication was provided to which patient, when this occurred and by which health-care provider.

At the end of each visit, Konuma says, patients who have cardiac devices, such as pacemakers, can then have the settings on those devices checked to ensure that they are functioning properly.

Other hospitals are using SATO’s HF RFID wristband, including Akita University Hospital, which has employed the bracelet for the past decade to identify patients and their treatment. This deployment may change to UHF RFID in the future, Konuma says, since UHF technology not only enables tags to be read at a greater distance, thereby providing more efficiency, but are also becoming less expensive than HF tags, thus reducing the overall cost of deployment for hospitals.