

RFID Systems May Disrupt the Function of Medical Devices

Researchers ask whether hospitals should adopt new guidelines for medical electronics' interoperability



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BY SANDRA UPSON // JUNE 2008

24 June 2008—The use of radio-frequency identification (RFID) systems in hospitals may not be entirely safe, new research suggests. According to a study published this week in the *Journal of the American Medical Association*, RFID tags and the devices they communicate with can disrupt the performance of medical equipment, including pacemakers and dialysis machines, potentially endangering the patients who depend on those devices.

Erik Jan van Lieshout and Remko van der Togt, along with

their colleagues at the University of Amsterdam's Academic Medical Center, tested whether the presence of RFID transponders and the readers they transmit to could interfere with the function of 41 different electronic medical devices. The team examined both an active RFID system, in which the tags have batteries that allow them to transmit continuously, and a passive system, whose tags are powered only when in the range of a transmitter's electromagnetic field. In 123 tests, they found 34 incidences of interference.

Of those, the researchers categorized 22 cases as hazardous, meaning that the interference caused an equipment fault that could have direct physical impact on a patient. For example, in two such incidences, a mechanical ventilator and a syringe pump switched off when the RFID system was transmitting near them. The passive RFID tag they used, which had a higher energy output and operated at a frequency of 868 megahertz, induced three times as many disruptions as the active system, which operated at 125 kilohertz.

None of the tests involved patients—just equipment—and no real-life cases have yet been reported of RFID transponders causing a device to malfunction, according to the Dutch research.

The health-care market for RFID systems, according to IDTechEx, a consultancy that focuses on RFID, is about US \$121 million, and the tags are increasingly becoming integrated into the hospital environment. They are used, for instance, to track the location of surgical sponges so they are not inadvertently left inside patients. RFID tags are also embedded in bracelets given to newborn babies to prevent kidnapping.

For van Lieshout, who works in his hospital's intensive care unit, the question of RFID interference arose after he had conducted some similar experiments on the use of cellphones in hospitals. Noticing the growing presence of RFID transponders in the ICU, van Lieshout decided to consult the medical literature and ask his colleagues for guidance on

whether the tags' transmissions could affect the health of his patients. "They told me, 'Oh yeah, it's pretty safe.' But I wanted to know, 'Well, how safe?' And no one knew," van Lieshout recalls.